The University of New South Wales

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

1977 Faculty Handbook
Heraldic Description of Arms

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’, 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 of New South Wales

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

1977 Faculty Handbook
The address of the University of New South Wales is:

PO Box 1, Kensington,
New South Wales, Australia 2033

Telephone: (02) 663 0351
Telegraph: UNITECH, SYDNEY
Telex AA26054

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University of New South Wales—Board of Studies in Science—Periodicals
University of New South Wales—Faculty of Biological Sciences—Periodicals
University of New South Wales—Faculty of Science—Periodicals
Information in this Handbook has been brought up to date as at 13 September 1976, 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. The 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 the University and its activities you should consult the University Calendar.

Now, see the following pages for other general information which may be of value to you.

Some people who can help you

Note: All phone numbers below are University extension numbers. If you are outside the University, dial 663 0351 and ask for the extension or dial 662—and then the extension number.

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 Deputy Registrar (Student Services), Mr Peter O'Brien, and his Administrative Assistant, Mr Stephen Briand, are located on the first floor of the Chancellery. They will see students who need advice and who have problems and are not sure whom they should see about them. Mr Briand looks after financial assistance matters. Enquire at room 148A, phone 2482 or 3164.

The Assistant Registrar (Examinations and Student Records), Mr John Warr, is located on the ground floor of the Chancellery. For particular enquiries regarding Student Records (including matters related to illness affecting study) contact Mr Jack Morrison (phone 2141), and regarding Examinations, Mr John Grigg (phone 2143). This section can also advise on matters relating to discontinuation of subjects and termination of courses. General enquiries should be directed to 3711.

The Assistant Registrar (Admissions and Higher Degrees), Mr Jack Hill, is located on the ground floor of the Chancellery. For particular enquiries regarding undergraduate courses phone Mr John Beauchamp on 3319. General enquiries should be directed to 3711.
The Adviser for Prospective Students, Mrs Fay Lindsay, is located on the ground floor of the Chancellery and is available for personal interview. For an appointment phone 3453.

The Assistant Registrar (Student Employment and Scholarships), Mr Jack Foley, is located on the ground floor of the Chancellery. Enquiries should be directed to 2086 (undergraduate scholarships), 2525 (graduate scholarships), and 3259 (employment).

The Housing Officer, Mrs Judy Hay, is located in the Student Amenities and Recreation Unit in Hut B at the foot of Basser Steps. For assistance in obtaining suitable lodgings phone 3260.

The Student Health Unit is located in Hut E on College Road. The Director is Dr Max Napthali. For medical aid phone 2679 or 3275.

The Student Counselling and Research Unit is located at the foot of Basser Steps. The Head is Mr George Gray. For assistance with educational or vocational problems ring 3681, 3685 or 2696 for an appointment.

The University Librarian is Mr Allan Horton. Library enquiries should be directed to 2048.

The Chaplaincy Centre is located in Hut F at the foot of Basser Steps. For spiritual aid consult Rev Phillip Jensen (Anglican)—2684; Rev Father Michael Fallon (Catholic)—2379; Dr Allen Elliott (Church of Christ)—2683; Rev Peter Holden (Methodist)—2683; Mr Glen Weare (Seventh Day Adventist)—3273; Mr Ze’ev Dar (Jewish)—3273; Rev Barry Waters (Baptist)—3984065.

The Students’ Union is located on the second floor of Stage III of the University Union where the SU full-time President or Education Vice-President are available to discuss any problems you might have. In addition the SU offers a range of diverse services including legal advice (full-time solicitor available), clubs and societies services, second-hand bookshop (buy or sell), new records/tapes at discount, food shop (The Nuthouse), a professional nursery/kindergarten House at Pooh Corner, a typesetting service, electronic calculators (bulk purchasing), health Insurance and AUS insurance, an information referral centre (the Infakt Bus), a bail fund and publications such as Tharunka, Orientation Magazine, Concessions Book and counter-course handbooks. For information about these phone 2929.

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**Calendar of Dates**

**1977**

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<th>Session 1</th>
<th>7 March to 14 May.</th>
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<td>(14 weeks)</td>
<td><strong>May Recess:</strong> 16 May to 21 May</td>
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<td>23 May to 18 June</td>
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<td><strong>Midyear Recess:</strong> 20 June to 23 July</td>
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<td>Session 2</td>
<td>25 July to 27 August</td>
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<tr>
<td>(14 weeks)</td>
<td><strong>August Recess:</strong> 29 August to 3 September</td>
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<td>5 September to 5 November</td>
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<td><strong>Study Recess:</strong> 7 November to 12 November</td>
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**Monday 14 November**

- Annual examinations begin

**Tuesday 6 December**

- Annual examinations end

**January**

**Monday 3**

- New Year’s Day—Public Holiday
- Last day for application for review of results of annual examinations

**Friday 7**

- Last day for application for permission to re-enrol by students who infringed re-enrolment rules at annual examinations

**Monday 10**

- Timetables for deferred examinations available

**Friday 14**

- Last day for acceptance of applications by Admissions Office for transfer to another course within the University

**Monday 24**

- Deferred examinations begin

**Monday 31**

- Australia Day—Public Holiday

**February**

**Saturday 5**

- Deferred examinations end

**Monday 14**

- Enrolment period begins for new students and students repeating first year

**Tuesday 15**

- Last day for appeal against exclusion by students who infringed re-enrolment rules at annual examinations

**Friday 18**

- Deferred examination results available

**Monday 21**

- Enrolment period begins for second and later year students

**Tuesday 22**

- Last day for application for review of deferred examination results
Friday 25

Last day for application for permission to re-enrol by students who infringed re-enrolment rules at deferred examinations

March

Monday 7

**Session 1 commences**

Friday 11

Last day for acceptance of enrolments by new students (late fee payable)

Thursday 17

Last day for appeal against exclusion by students who infringed re-enrolment rules at deferred examinations

April

Friday 1

Last day for acceptance of enrolments by students re-enrolling in second and later years (late fee payable)

Last day for students other than those attending the University for the first time to discontinue without failure subjects which extend over Session 1 only

Last day to enrol in additional subjects

Friday 8 to

Monday 11

Easter

Monday 25

Anzac Day—Public Holiday

Friday 29

Last day for students attending the University for the first time to discontinue without failure subjects which extend over Session 1 only

May

Tuesday 10

Publication of provisional timetable for June/July examinations

Thursday 12

Last day for acceptance of corrected enrolment details forms

Last day for applications from students completing requirements at end of Session 1 for admission to University degrees and diplomas

Monday 16

**May Recess begins**

Friday 20

Last day for students other than those attending the University for the first time to discontinue without failure subjects which extend over the whole academic year

Saturday 21

**May Recess ends**

Monday 23

Last day for students to advise of examination timetable clashes

June

Tuesday 7

Publication of timetable for June/July examinations

Monday 13

Queen's Birthday—Public Holiday

Sunday 19

**Session 1 ends**

Monday 20

**Midyear Recess begins**

Tuesday 21

Midyear examinations begin

July

Tuesday 5

Midyear examinations end

Saturday 23

**Midyear Recess ends**

Monday 25

**Session 2 begins**

Thursday 28

Foundation Day

August

Friday 5

Last day for students attending the University for the first time to discontinue without failure subjects which extend over the whole academic year

Friday 19

Last day for students other than those attending the University for the first time to discontinue without failure subjects which extend over Session 2 only

Monday 29

**August Recess begins**

Wednesday 31

Last day for acceptance of applications for re-admission in 1978 after exclusion under the re-enrolment rules

September

Saturday 3

**August Recess ends**

Monday 12

Last day for applications from students completing requirements at end of Session 2 for admission to University degrees and diplomas

Wednesday 14

Last day for return of corrected enrolment details forms

Friday 16

Last day for students attending the University for the first time to discontinue without failure subjects which extend over Session 2 only

Tuesday 27

Publication of provisional timetable for annual examinations

Friday 30

Last day to apply to MUAC for transfer to another university in Sydney metropolitan area and Wollongong

October

Monday 3

Eight Hour Day—Public Holiday

Friday 7

Last day for students to advise of examination timetable clashes

Tuesday 25

Publication of timetable for annual examinations

November

Saturday 5

**Session 2 ends**

Monday 7

**Study Recess begins**

Monday 14

Annual examinations begin

December

Tuesday 6

Annual examinations end

Sunday 25

Christmas Day

Monday 26

Boxing Day

Tuesday 27

Public Holiday
1978

Session 1
6 March to 14 May
May Recess: 15 May to 21 May
22 May to 18 June
Midyear Recess: 19 June to 23 July
24 July to 27 August
August Recess: 28 August to 3 September
4 September to 5 November
Study Recess: 6 November to 12 November
Monday 13 November
Tuesday 7 December
Annual examinations begin
Annual examinations end

January
Monday 2
Public Holiday
Friday 6
Last date for application for review of results of annual examinations
Monday 9
Publication of timetable for deferred examinations
Friday 13
Last day for acceptance of applications by Admissions Office for transfer to another course within the University
Tuesday 24
Deferred examinations begin
Monday 30
Australia Day—Public Holiday

February
Saturday 4
Deferred examinations end
Monday 13
Enrolment period begins for new students and students repeating first year
Friday 17
Results of deferred examinations available
Monday 20
Enrolment period begins for second and later year students
Tuesday 21
Last day for applications for review of deferred examination results

The Academic Year

The academic year is divided into two sessions, each containing 14 weeks for teaching. There is a recess of five weeks between the two sessions as well as short recesses of one week within each of the sessions.

Session 1 commences on the first Monday of March.

Organization of the University

Rapid development has been characteristic of the University of New South Wales since it was first incorporated by an Act of Parliament in 1949, under the name of the New South Wales University of Technology.

In 1976 the University had 18,378 students and 4000 staff who worked in more than eighty buildings. These figures include staff and students at Broken Hill (W. S. and L. B. Robinson University College), Duntroon (the Faculty of Military Studies) and Jervis Bay.

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 42 members representative of the professions, commerce and industry, the legislature, employee organizations, rural, pastoral and agricultural interests, and the academic staff of the University, its graduates and students.

The Council meets six times per year and its members also serve on special committees dealing with such matters as 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, and the Deputy Chancellor is Dr F. M. Mathews.

The Professorial Board

The Professorial Board is one of the two chief academic units within the University and includes all the professors from the various faculties. 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 these and similar matters are presented to Council for its consideration and adoption.

The Faculties

The Dean, who is also a professor, is the executive head of the Faculty. Members of each Faculty meet regularly to consider matters pertaining to their own areas of study 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 eleven Faculties are Applied Science, Architecture, Arts, Biological Sciences, Commerce, Engineering, Law, Medicine, Military Studies, Professional Studies, Science together with the Australian Graduate School of Management. In addition, the Board of Studies in General Education fulfills 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 science course.

The Schools

Once courses of study have been approved they come under the control of the individual Schools (e.g. the School of Chemistry, the School of Mathematics). The professorial 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, Professor Rupert Myers, is charged with managing and supervising the administrative, financial and other activities of the University.

He is assisted in this task by three Pro-Vice-Chancellors, Professor John Thornton, Professor Rex Vowels and Professor Albert Willis; the Deans and the three heads of the administrative divisions.

General Administration

The administration of general matters within the University comes mainly within the province of the Registrar, Mr Keith Jennings, the Bursar, Mr Tom Daly, and the Business Manager (Property), Mr Bob Fletcher.

The Registrar’s Division is concerned chiefly with academic matters such as the admission of students, and the administration of examinations as well as the various student services (health, employment, amenities, and counselling).

The Bursar’s Division is concerned with the financial details of the day-to-day administration and matters to do with staff appointments, promotions, etc.

The Property Division is concerned with the maintenance of buildings and grounds and equipment, and includes the University Architect’s office.

Student Representation on Council and Faculties

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 one of their number to a Faculty for each 500 registered students, with a minimum of three students per Faculty. Elections are for a one-year term of office. New provisions for student membership of faculties and boards of studies have been approved by Council, providing for each faculty/board to recommend its own formula for determining the number of students eligible.

Open Faculty Meetings

If you wish you may attend a Faculty meeting. You should seek advice at the office of the Faculty whose meeting you wish to attend, as different faculties have their own rules for the conduct of open meetings.

Award of the University Medal

The University may award a bronze medal to the students who have most distinguished themselves in their final year.

Identification of Subjects by Numbers

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

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 G54, Morven Brown Building (663 0351 Extn. 3478).
The University Library

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

There are also library services at other centres:

The Water Reference Library situated at Manly Vale (Phone 948 0261) which is closely associated with the Physical Sciences Library.

The library at the Broken Hill Division in the W. S. and L. B. Robinson University College building. Phone 6022/3/4.

The library at the Royal Military College, Duntroon, 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 day and evening periods. The exact hours of opening vary during the course of the academic year.

Staff and students normally use a machine-readable identification card to borrow from the University libraries. For students, a current union card is acceptable. Staff must apply to the library for a library card.

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 450 men and women students, as well as staff members. Fees are payable on a session basis. Apply in writing to the Master, PO Box 24, Kensington, NSW 2033.

International House

International House accommodates 154 students from Australia and up to twenty other countries. Preference is given to more senior undergraduates and graduate students. Apply in writing to the Warden, International House, PO Box 88, Kensington, NSW 2033.

New College

This Church of England College is open to all students without regard to race or religion. It has accommodation for approximately 220 students and is co-educational. Enquiries should be addressed to the Master, New College, Anzac Parade, Kensington, NSW 2033.

Shalom College

Shalom College 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. Apply in writing to the Master, Shalom College, The University of New South Wales, PO Box 1, Kensington, NSW 2033.

Warrane College

Warrane College provides accommodation for 200 men and is open to students of all ages, backgrounds and beliefs. A comprehensive tutorial program is offered along with a wide variety of activities and opportunities to meet informally with members of the University staff. Non-resident membership is available to male students who wish to participate in College activities and make use of its facilities. Warrane is directed by the International Catholic lay association Opus Dei. Apply in writing to the Master, Warrane College, PO Box 123, Kensington, NSW 2033. Phone: 663 6199.

Creston Residence

Creston, associated with Warrane College, offers residence for 25 full-time undergraduate and graduate women students of all nationalities and denominations. It is directed by the Women's Section of Opus Dei, a Catholic lay association. Further information: The Principal, 36 High Street, Randwick, NSW 2031.

Other Accommodation

Off-campus Accommodation

Students requiring other than College accommodation may contact the Housing Officer in the Student Amen-
Student Employment and Scholarships

The Student Employment and Scholarships Unit offers assistance with career employment for final year students and graduates of the University. This service includes the mailing of regular job vacancy notices to registered students and a campus interview program for final year students.

Careers advice and assistance is also available to undergraduates. Assistance is offered in finding vacation employment which gives either course-related experience or industrial training experience, where this is a course requirement. Information and advice regarding cadetships, undergraduate and graduate scholarships is also available.

The service is located in the Chancellery on the ground floor.

Phone extension 3259 for employment and careers advice, or extension 2086 for cadetships and industrial training information.

Student Health

A student health clinic and first aid centre is situated within the University. It is staffed by three qualified medical practitioners, assisted by two nursing sisters. The medical service, although therapeutic, is not intended to entirely 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 for specialist opinion and/or treatment. 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 E 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 extension 2679 or 3275 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. These clinics are open to staff and students and appointments may be made for the Student Health Unit clinic by telephoning 698 9499, or for The Prince of Wales Hospital clinics by telephoning 399 0111.

Student Counselling and Research

The Student Counselling and Research Unit provides individual and group counselling for all students—prospective, established and graduate. Self-help programs are also available. Opportunities are provided for parents and others concerned with student progress to see members of the counselling staff.

The service which is free, informal and personal is designed to help students with planning and decision making, and a wide variety of concerns and worries which may be affecting personal, educational and vocational aspects of their lives.

The Unit pursues research into factors affecting student performance, and the published results of its research and experience are helpful in improving University and other counselling services, and the quality of student life.

Counselling appointments may be arranged during sessions and recesses between 9 am and 7 pm. Phone 663 0351, extension 3681, 3685 and 2696, or call at the Unit which is located at the foot of Basser Steps. Urgent interviews are possible on a walk-in basis between 9 am and 5 pm. Group counselling programs are offered both day and evening between 9 am and 9 pm by special arrangement. Self-help programs are arranged to suit the student's time and convenience.

Student Amenities and Recreation

In general the Student Amenities and Recreation Unit seeks ways to promote the physical, social and educational development of students through their leisure time activities. The Unit provides, for example, a recreational program for students and staff at the Physical Education and Recreation Centre; negotiates with the Public Transport Commission of NSW on student travel concessions and supplies concession forms for bus, rail, ferries and...
planes; assists students with off-campus housing; and, in consultation with the Sports Association, assists various recognized clubs.

The Unit is located in Hut B at the foot of Basser Steps. The various services may be contacted by phone on the following extensions: Recreation Program 3271; Travel 2617; Accommodation 3260; Sports Association 2673.

**Physical Education and Recreation Centre**

The Student Amenities and Recreation Unit provides a recreational program for students and staff at the Physical Education and Recreation Centre. The Centre consists of eight squash courts and a main building, the latter containing a large gymnasium and practice rooms for fencing, table tennis, judo, weight-lifting, karate and jazz ballet, also a physical fitness testing room. The recreational program includes intramurals, teaching/coaching, camping, and fitness testing. The Centre is located on the lower campus adjacent to High Street. The Supervisor of PERC may be contacted on extension 3271.

**The Sports Association**

The Sports Association caters for a variety of competitive sports for both men and women. Membership is compulsory at $6 per year for all registered students and is open to all members of staff and graduates of the University.

The Sports Association office is situated in Hut G, near the bottom of Basser Steps, and the control of the Sports Association is vested in the General Committee. The Executive Officer of the Sports Association may be contacted on extension 2673.

**The University Union**

The University Union provides the facilities students, staff and graduates require in their daily University life and thus an opportunity for them to know and understand one another through associations outside the lecture room, the library and other places of work.

The Union is housed in three buildings near the entrance to the Kensington Campus from Anzac Parade. These are the Roundhouse, the Blockhouse and the Squarehouse. Membership of the Union is compulsory at $45 per year for all registered students and is open to all members of staff and graduates of the University.

The full range of facilities provided by the Union includes a cafeteria service and other dining facilities, a large shopping centre, cloak room, banking and hairdressing facilities, showers, a women's lounge, common, games, reading, meeting, music, practice, craft and dark rooms. Photocopying, sign printing, and stencil cutting services are also available. The Union also sponsors special concerts (including lunchtime concerts) and conducts courses in many facets of the arts including weaving, photography, creative dance and yoga. Exhibitions are held in the John Clark Gallery.

Full information concerning courses is contained in a booklet obtainable from the Union's Program Department. The University Union should not be confused with the Students' Union or Students' Representative Council as it is known in some other universities. This latter body has a representative function and is the instrument whereby student attitudes and opinions are crystallized and presented to the University and the community.

**The Students' Union**

The Students' Union is run by students and represents them on and off campus. Presidential elections are by popular vote and all students who have completed two years at the University are eligible for election.

A full-time President, elected each year by popular ballot, directs the entire administration of the Students' Union and its activities, through the permanent Administrative Officer.

Other full-time officers include the Education Vice-President who works towards the implementation of Student Union education policy and in assisting students with problems they may encounter in the University; Director of Overseas Students who deals with specific problems these students may encounter while in Australia.

Both are elected by students with the latter elected by overseas students.

Membership is compulsory at $10 per annum*.

The activities of the Students' Union include:

1. Infakt: a student-run information referral service. If you want someone to talk to or need help of any kind see the people at Infakt located in the bus at the foot of Basser Steps.
2. A casual employment service.
3. Organization of Orientation Week.
4. Organization of Foundation Day.
6. Publication of the student paper Tharunka.

* A rise in Students' Union fees may occur in 1977.
7. A free legal service run by a qualified lawyer employed by the Students' Union Council.

8. Students' Union Record Shop which gives an 18% discount.

9. The Nuthouse which deals in bulk and health foods.

10. Secondhand Bookshop for cheap texts.

11. Clubs and societies receive money from the Students' Union through CASOC (Clubs and Societies on Campus).

The Students' Union is affiliated with the Australian Union of Students (AUS) which represents students on the national level.

The Students' Union is located on the second floor, Stage III, the Union.

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**Chaplaincy Centre**

This service is provided for the benefit of students and staff by various religious and spiritual beliefs. Chaplains are in attendance at the University at regular times. A Chapel is also available for use by all denominations. For further details, turn to page 2.

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**Other Services and Activities**

**CASOC** All clubs and societies on campus (except sporting clubs) are loosely organized under the umbrella of CASOC, which is a committee of the Students' Union. Some of these clubs are: the Motor Cycle Club; Chess Club; Dramsoc; Opunka; Kite Club and the Jazz Society.

**School and Faculty Associations** Many schools and faculties have special clubs with interests in particular subject fields. Enquire at your Faculty Office for information.

**University Co-operative Bookshop Limited** Membership is open to all students, on initial payment of a fee of $10, refundable when membership is terminated. Members receive an annual rebate on purchases of books.

**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 notice boards for details.

**Australian Armed Forces** Enquiries should be directed to:

- **Royal Australian Navy**: Royal Australian Naval Liaison Officer, Professor J. S. Ratcliffe, Commander, RANR, at the School of Chemical Engineering. Phone extension 2406.
- **University of New South Wales Regiment**: The Adjutant, Regimental Depot, Day Avenue (just west of Anzac Parade). Phone 663 1212.

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**Financial Assistance to Students**

**Tertiary Education Assistance Scheme**

Under this scheme, which is financed by the Australian 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.

Students in the following types of university courses are eligible for assistance:

- Undergraduate and graduate degree courses
- Graduate diplomas
- Approved combined Bachelor degree courses
- Master's qualifying courses if the course is the equivalent of an honours year and the student has not attempted an honours year.

**Benefits** (as at 30 June 1976)

Means-tested Living Allowance The maximum rates of living allowances are $1,000 per annum for students living at home and $1,600 per annum for students living away from home. The maximum rates of living allowance will be paid where the adjusted family income is equal to or less than $7,600 per annum. The adjusted family income is assessed by subtracting from the gross income of both parents their business expenses and an amount of $450 for each dependent child other than the student.

When the adjusted family income exceeds $7,600 pa the amount of living allowance will be reduced by $2 for every $10 of income until the family income exceeds $15,200 per annum. After this level, the living allowance will be reduced by $3 for every $10 of income.

A concession may be made where there are other children in the family undertaking tertiary education with scholarship assistance from schemes other than the Tertiary Education Assistance Scheme of less than $600 pa.

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**Royal Australian Air Force**: Undergraduates interested in the RAAF Undergraduate Scheme should contact The Recruiting Officer, Defence Forces Recruiting Centre, 320 Castlereagh Street, Sydney.
Students qualifying for living allowance will also receive the following allowances where appropriate:

Incidentals Allowance The Incidentals Allowance of $100 is designed to help the student meet the cost of those fees which have not been abolished—the Students' Union, University Union and Sports Association fees, and other expenses associated with their studies.

Travel Allowance Students whose home is in the country may be reimbursed the cost of three return trips per year, during vacation time.

Dependants' Allowance This is made up of allowances of $15 per week for a dependent spouse and $7 per week for each child.

How to Apply 1976 Higher School Certificate candidates and tertiary students receiving an allowance were sent forms last October. Other students may obtain forms from the Admissions Section or the Student Employment and Scholarships Unit, or from the Regional Director, Department of Education, 323 Castlereagh Street, Sydney, NSW 2000 (Phone 218 8800). The administrative closing date for 1977 applications was 31 October 1976.

Scholarships, Cadetships, Prizes

1. Undergraduate Scholarships In addition to finance provided under the Australian Government’s Tertiary Education Assistance Scheme there are a number of scholarships, cadetships, prizes and other forms of assistance available to undergraduate students. Details of procedures for application for these awards are contained in the Calendar.

There are also special scholarships not administered by the University, information about which may be obtained from the School office.

Further information and advice regarding scholarships is available from the Student Employment and Scholarships Unit in the Chancellery Building.

2. Graduate Awards An honours degree is generally an essential requirement for gaining one of the many graduate scholarships which are available at the University. Therefore gifted students should not neglect the opportunity to qualify for honours and thus become eligible for an award.

Details of graduate awards are contained in the University Calendar.

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 the Students' Union, the University Union and other sources have made funds available for urgent cash loans not exceeding $100. These loans are normally repayable within one month.

3. Early in 1973 the Australian Government 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. Repayment usually commences after graduation or upon withdrawal from the course. Students are required to enter into a formal agreement with the University to repay the loan.

From the same source students who are in extremely difficult financial circumstances may apply for assistance by way of a non-repayable grant. In order to qualify for a grant a student must generally show that the financial difficulty has arisen from exceptional misfortune.

In all cases assistance is limited to students with reasonable academic records and whose financial circumstances warrant assistance.

Inquiries about all forms of financial assistance should be made at the office of the Deputy Registrar (Student Services), Room 148A, in the Chancellery.

Financial Assistance to Aboriginal Students

Financial assistance is available from a number of sources to help Aboriginal students. Apart from the Australian Government's Tertiary Education Assistance Scheme there is a Commonwealth Aboriginal Study Grant Scheme. Furthermore, the University may assist Aboriginal students with some essential living expenses in exceptional circumstances.

All inquiries relating to this scheme should be made at the office of the Deputy Registrar (Student Services), Room 148A, in the Chancellery.

Fund for Physically Handicapped and Disabled Students

The University has a small fund (started by a generous gift from a member of staff who wishes to remain anonymous) available for projects of benefit to handicapped and disabled students. Inquiries should be made at the office of the Deputy Registrar (Student Services), Room 148A, in the Chancellery.
Rules and Procedures

The University, in common with other large organizations, has some agreed ways of doing things in order to operate for the benefit of all members. The rules and procedures listed below will affect you at some time or another. In some cases there are penalties (eg fines or exclusion from examinations) for failure to observe these procedures and therefore they should be read with care.

Admission

Where can I get information about admission?

The Admissions Office, located in the Chancellery on the upper campus, provides information for students on admission requirements, undergraduate and graduate courses and enrolment procedures. The Admissions Office is open from 9 am to 5 pm Monday to Friday (excluding the lunch hour 1 pm to 2 pm). During enrolment the office is also open for some part of the evening.

Applications for special admission, admission with advanced standing and from persons relying for admission on overseas qualifications should be lodged with this office. The Office also receives applications 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. It is essential that the closing dates for lodgment of applications are adhered to. For further details see the sections below on Enrolment and Fees.

Applications for admission to undergraduate courses from students who do not satisfy the requirements for admission (see section on Requirements for Admission), from students seeking admission with advanced standing, and from students who have a record of failure at another university, are referred by the Admissions Office to the Admissions Committee of the Professorial Board.

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

Details of the procedure to be followed by students seeking entry to first year courses at the University may be obtained from the Admissions Office or the Metropolitan Universities Admissions Centre.

How do I qualify for admission?

In order to enter an undergraduate course you must qualify for matriculation to the University; satisfy requirements for admission to the course of subjects chosen; and be selected for admission to the faculty or course you wish to enter. Full details of matriculation and admission requirements are contained in a pamphlet obtainable at the Admissions Office and in the Calendar.

Enrolment

How do I enrol?

All students, except those enrolling in graduate research degrees (see below), must lodge an authorized enrolment form with the Cashier on the day the enrolling officer signs the form or on the day their General Studies electives are approved if their course requires this.

All students, except those enrolling in graduate research degrees and those exempted (see below), should on that day also either pay the required fees or lodge an enrolment voucher or other appropriate authority.

What happens if I am unable to pay fees at the time of enrolment?

If you are unable to pay fees by the due date you may apply in writing to the Deputy Registrar (Student Services) for an extension of time which may be granted in extenuating circumstances.

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 that time (see "Fees" below). Payment may be made through the mail in which case it is important that the student registration number be given accurately.

New Undergraduate Enrolments

Persons who are applying for entry in 1977 must lodge an application for selection with the Metropolitan Universities Admissions Centre, PO Box 7049, GPO, Sydney 2001, by 1 October 1976.
Those who are selected will be required to complete enrolment at a specified appointment time before the start of Session 1. Compulsory fees must be paid on the day of the appointment. In special circumstances, however, and provided class places are still available, students may be allowed to complete enrolment after the prescribed week, subject to the payment of a penalty (see below).

Application forms and details of the application procedures may be obtained from the Admissions Office.

First Year Repeat Students

First year students who failed more than half the program at the 1976 Annual Examinations and who were not granted any deferred examinations should NOT follow the above procedure. They are required to show cause why they should be allowed to continue in the course, and should await instructions in writing from the Registrar as to the procedure.

Later Year Enrolments

Students should enrol through the appropriate School in accordance with the procedures set out in the current year's booklet, Enrolment Procedures, available from the Admissions Office and from School offices.

New Research Students

Students enrolling for the first time in graduate research degrees will receive an enrolment form by post. They have two weeks from the date of offer of registration in which to lodge the enrolment form with the Cashier and pay the appropriate fees. Completion of enrolment after this time will incur a penalty (see below).

Re-enrolling Research Students

Students re-enrolling in research degrees should lodge the enrolment form with the Cashier as soon as possible but no later than the end of the second week of Session 1. Completion of enrolment after that date will incur a penalty (see below).

Submission of Graduate Thesis or Project Report at Commencement of Session 1

A candidate who has completed all the work for a graduate degree except for the submission of a thesis or project report is required to re-enrol and pay fees as outlined above unless the thesis or project report is submitted by the end of the second week of Session 1 in which case the candidate is not required to re-enrol. Those required to re-enrol may claim a refund of fees if able to withdraw (see below).

Miscellaneous Subject Enrolments

Students may be permitted to enrol for miscellaneous subjects (ie as students not proceeding to a degree or diploma) provided the Head of the School offering the subject considers it will be of benefit and there is accommodation available. Only in exceptional cases will subjects taken in this way count towards a degree or diploma. Students who are under exclusion may not be enrolled in miscellaneous subjects which may be counted towards courses from which they have been excluded.

Students seeking to enrol in miscellaneous subjects should obtain a letter of approval from the Head of the appropriate School or his representative permitting them to enrol in the subject concerned. The letter should be given to the enrolment officer at the time of enrolment.

Students who have obtained written permission to enrol may attend the Unisearch House enrolment centre on: Friday 4 March 9.30 am to 12.30 pm or they may attend the Admissions Office, Chancellery, at the times shown below.

Week Commencing
7 March Monday to Friday 9.30 am to 1.00 pm 2.00 pm to 4.30 pm 5.30 pm to 7.00 pm
14 March Monday to Friday 9.30 am to 1.00 pm 2.00 pm to 4.30 pm Wednesday and Friday 5.30 pm to 7.00 pm

Final Dates for Completion of Enrolments

No enrolments for courses extending over the whole year or for Session 1 only will be accepted from new students after the end of the second week of Session 1 (18 March 1977) except with the express approval of the Deputy Registrar (Student Services) and the Heads of the Schools concerned; no later year enrolments for courses extending over the whole year or for Session 1 only will be accepted after the end of the fourth week of Session 1 (1 April 1977) except with the express approval of the Deputy Registrar (Student Services) and the Heads of Schools concerned. No enrolments for courses in Session 2 only will be accepted after the end of the second week of Session 2 (5 August 1977) except with the express approval of the Deputy Registrar (Student Services) and the Heads of Schools concerned.

How do assisted students (eg scholarship holders) enrol?

Scholarship holders or sponsored students who have an enrolment voucher or letter of authority from their sponsor should present it at the time of enrolment. 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 must pay the fees (and arrange a refund later). Such vouch-
ers 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.

**What special rules apply if I wish to be considered for admission with advanced standing?**

If you make application to register as a candidate for any degree or other award granted by the University you may be admitted to the course of study with such standing on the basis of previous attainments as may be determined by the Professorial Board. For complete details regarding "Admission with Advanced Standing" consult the University Calendar.

**Can I transfer from one course to another?**

To transfer from one course to another you must apply on an application form obtainable from the Admissions Office by 16 January. If your application is successful you are required to comply with the enrolment procedures for the year/stage of the new course and, unless otherwise instructed, you should present the letter granting transfer to the enrolling officer. You should also inform the enrolling officer of the school in which you are enrolled of your intention to transfer.

**Can I change my course program?**

If you wish to seek approval to substitute one subject for another, add one or more subjects to your program or discontinue part or all of your program, you must make application to the Registrar through the Head of the School responsible for the course on forms available from the School office. The Registrar will inform you of the decision. Application to enrol in additional subjects must be submitted by the end of the fourth week of Session 1.

It is emphasized that failure to sit for examinations in any subject in which you are enrolled will be regarded as failure to satisfy the examiners in that subject unless written approval to withdraw without failure has been obtained from the Registrar.

**Withdrawal from subjects**

Students are permitted to withdraw from subjects without being regarded as having failed, provided they apply by the dates indicated.

**First Year Students**

1. one-session subjects: the end of the eighth week of session;
2. double-session subjects: the end of the second week of Session 2.

For the purpose of this rule a first-year student is defined as one who is attending the University for the first time either on a full- or part-time basis and is enrolled in the first year or first stage of a course.

**Other Students**

1. one-session subjects: the end of the fourth week of session;
2. double-session subjects: the end of the May Recess.

**How do I enrol after an absence of twelve months or more?**

If you have had a leave of absence for twelve months and wish to resume your course you should follow the instructions about re-enrolling given in the letter granting your leave of absence. If you do not fully understand or have lost these instructions, then you should contact the Admissions Office either in December of the preceding year or before October in the year preceding the one in which you wish to resume your course.

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

**Are there any restrictions 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. A student enrolled for the first time in any undergraduate course in the University shall be required to show cause why he/she should be allowed to continue the course if that student fails more than half the program in which he/she is enrolled. In order that students may calculate half their program, the weighting of subjects in each course is defined in Schedule A,* which may be varied from time to time by the Professorial Board.

**Repeated-failure Rule**

2. A student shall be required to show cause why he/she should be allowed to repeat a subject which that student has failed more than once. Where the subject is prescribed as part of the student's course he/she shall also be required to show cause why he/she should be allowed to continue that course. Failure in a deferred examination as well as in the initial examination counts for the purposes of this rule as one failure.

*For details of Schedule A see Restrictions upon Students Re-enrolling in the University Calendar.
General Rule

3. The Re-enrolment Committee may, on the recommendation of the relevant faculty or board of studies, review the academic progress of any student. If that student's academic record seems to demonstrate, in the opinion of the Committee, the student's lack of fitness to pursue a subject or subjects and/or a course or courses, the Committee, may require that student to show cause why he/she should be allowed to re-enrol in such subject(s) and/or course(s).

The Session-unit System

4. A A student who infringes the provisions of Rules 1 or 2 at the end of Session 1 of any year will not be required to show cause at that time but 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 that course.

B Such a student will be required to show cause at the end of the year, except that a student who has infringed Rule 2 at the end of Session 1, repeats the subject(s) in question in Session 2, and passes it/them, will not be required to show cause on account of any such subject.

Exemption from Rules by Faculties

5. A A faculty or board of studies examination committee may, in special circumstances, exempt a student from some or all of the provisions of Rules 1 and 2.

B Such a student will not be required to show cause under such provisions and will be notified accordingly by the Registrar.

'Showing Cause'

6. A A student wishing to show cause must apply for special permission to re-enrol. Application should be made on the form available from the Examinations and Student Records Section 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.

B Each application shall be considered by the Re-enrolment Committee which shall determine whether the cause shown is adequate to justify the granting of permission to re-enrol.

Appeal

7. A Any student who is excluded by the Re-enrolment Committee from a course and/or subject(s) under the provisions of the Rules 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 he 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.

B The notification to any student of a decision by the Re-enrolment Committee to exclude him/her from re-enrolling in a course and/or subject(s) shall indicate that the student may appeal against that decision to the Appeal Committee. In lodging such an appeal with the Registrar the student should provide a complete statement of all grounds on which the appeal is based.

C The Appeal Committee shall determine the appeal after consideration of the student's academic record, his/her application for special permission to re-enrol, and the stated grounds of appeal. In exceptional circumstances, the Appeal Committee may require the student to appear in person.

Exclusion

8. A A student who is required to show cause under the provisions of Rules 1 or 3 and either does not attempt to show cause or does not receive special permission to re-enrol from the Re-enrolment Committee (or the Appeal Committee on appeal) shall be excluded from re-enrolling in the subject(s) and course(s) on account of which he was required to show cause. Where the subjects failed are prescribed as part of any other course (or courses) he/she shall not be allowed to enrol in any such course.

B A student who is required to show cause under the provisions of Rule 2 and either does not attempt to show cause or does not receive special permission to re-enrol from the Re-enrolment Committee (or the Appeal Committee on appeal) shall be excluded from re-enrolling in any subject he/she has failed twice. Where the subject failed is prescribed as part of the student's course he/she shall also be excluded from that course. Where the subject failed is prescribed as part of any other course (or courses) he/she shall not be allowed to enrol in any such course.

C A student excluded from a course or courses under the provisions of A or B may not enrol as a miscellaneous student in subjects which may be counted towards any such course.

† It is proposed that under this arrangement, the membership of the Appeal Committee will be Pro-Vice-Chancellor J. B. Thornton (Chairman), Professor D. M. McCallum, Chairman of the Professorial Board, and a member of Council in the category of members elected by the graduates of the University, nominated by the Vice-Chancellor.
Re-admission after Exclusion

9. A An excluded student may apply to the Re-enrolment Committee for re-admission after two academic years.

B An application for re-admission after exclusion should be made on the form available from the Examinations and Student Records Section and should be lodged with the Registrar not later than 31 August in the year prior to that for which re-admission is sought. A late application may be accepted at the discretion of the University.

C An application should include evidence that the circumstances which were deemed to operate against satisfactory performance at the time of exclusion are no longer operative or are reduced in intensity and/or evidence of appropriate study in the subject(s) (or the equivalent) on account of which the applicant was excluded.

Restrictions and Definitions

10. A These rules do not apply to students enrolled in programs leading to a higher degree or graduate diploma.

B A subject is defined as a unit of instruction identified by a distinctive subject number.

How do I apply for admission to degree or diploma?

Applications for admission to a degree or diploma of the University must be made on the appropriate form by 12 September, in a student’s final year. Forms are mailed to all final year students. Don’t forget to inform the University if you subsequently change your address so that correspondence related to the ceremony will reach you without delay. Applicants should ensure that they have completed all requirements for the degree or diploma, including industrial training where necessary. Any variation such as cancelling of application in order to proceed to an honours degree or submission of an application following discontinuation of honours program, must be submitted in writing to the Registrar no later than 30 January.

Fees*

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

Do I have to pay fees for tuition?

As a result of a decision by the Commonwealth Government, no tuition fees are charged in 1977.

What other fees and charges are payable?

Apart from the tuition fees (above) there are other fees and charges which include those charges raised to finance the expenses incurred in operating student activities such as the University Union, the Students’ Union, the Sports Association and the Physical Education and Recreation Centre. Penalties 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 which are lent to students for their personal use during attendance in certain subjects. Accommodation charges, costs of subsistence on excursions, field work etc, and for hospital residence (medical students) are payable in appropriate circumstances.

How much is my contribution to student activities and services on campus?

All students (with the exceptions noted below) will be required to pay the following fees if enrolling for a program involving two sessions. Those enrolling for only one session will pay one-half of the Student Activities Fees, but the full University Union entrance fee, if applicable.

Student Activities Fees

University Union—$25 entrance fee, payable on first enrolment

University Union—$45 annual subscription

Sports Association—$6 annual subscription

Students’ Union:

Students enrolling in full-time courses—$10 annual subscription

Students enrolling in part-time courses—$5 annual subscription

Miscellaneous—$25 annual fee.

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

Are fees charged for examinations?

Generally there are no charges associated with examinations; however, two special examination fees are applied:

Examinations conducted under special circumstances—for each subject .... $11

Review of examination result—for each subject .... $11

What penalties exist for late payment of fees?

The following additional charges will be made in 1977 when fees are paid late:

Failure to lodge enrolment form according to enrolment procedure .... $20

* Fees quoted are current at the time of publication and may be amended by the Council without notice.
Payment of fees after end of second week of session ... ... ... ... ... ... ... ... ... ... ... ... $20
Payment of fees after end of fourth week of session $40

Locations and Hours of Cashier

Cashier's Offices are open during the enrolment periods referred to in this booklet. The locations and hours are shown below:

Unisearch House
221 Anzac Parade
Week Commencing 21 February
Monday and Thursday 10.00 am to 1.00 pm 2.00 pm to 5.00 pm 6.00 pm to 9.00 pm
Wednesday 10.00 am to 1.00 pm 2.00 pm to 5.00 pm
Friday 9.30 am to 1.00 pm

Chancellery
Week Commencing 21 February
Monday to Friday 9.30 am to 1.00 pm 2.00 pm to 4.30 pm
Friday 6.00 pm to 8.30 pm
First Week of Session 1 Commencing 7 March
Monday to Friday 9.30 am to 1.00 pm 2.00 pm to 4.30 pm 5.30 pm to 8.00 pm
Second Week of Session 1 Commencing 28 March
Monday to Friday 9.30 am to 1.00 pm 2.00 pm to 4.30 pm
Wednesday and Friday 5.30 pm to 8.00 pm

Third Week of Session 1 Commencing 21 March
Monday to Friday 9.30 am to 1.00 pm 2.00 pm to 4.30 pm
Fourth Week of Session 1 Commencing 14 March
Monday to Friday 9.30 am to 1.00 pm 2.00 pm to 4.30 pm
Friday 26 5.30 pm to 8.00 pm

Who is exempt from payment of fees?

1. Life members of University Union, Sports Association, and Students' Union are exempt from the relevant fee or fees.
2. Students enrolled in courses classified as External are exempt from all Students Activities Fees and the University Union entrance fee.
3. University Union fees and subscriptions may be waived by the Deputy Registrar (Student Services) for students enrolled in graduate courses in which the academic requirements require no attendance on the Kensington campus.
4. 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 in a miscellaneous subject or 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.
5. Undergraduate students of a recognized university outside Australia who attend the University of New South Wales with the permission of the Dean of the appropriate faculty and 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.
6. 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.
7. Graduate students resubmitting a thesis or project only are exempt from all Student Activities Fees.
8. All Student Activities Fees, for one or more sessions may be waived by the Deputy Registrar (Student Services) for graduate students who are given permission to pursue their studies away from the Kensington campus for one or more sessions.

How much will textbooks and special equipment (if any) cost?

You must allow quite a substantial sum for textbooks. This can vary from $200 to $600 depending on the course taken. These figures are based on the cost of new books. The Students' Union operates a second-hand bookshop. Information about special equipment costs, accommodation charges and cost of subsistence on excursions, field work, etc., and for hospital residence (medical students) are available from individual schools.

Will I receive any refund if I withdraw from a course?

Yes. The following rules apply:
1. If you withdraw from courses you are required to notify the Registrar in writing.
2. Where notice of withdrawal from a course is received by the Registrar before the first day of Session 1 a refund of all fees paid will be made. After that time only a partial refund will be made. See the Calendar for details.
What happens if I fail to pay the prescribed fees or charges?
If you fail to pay prescribed fees or charges or become otherwise indebted to the University and you fail to make a satisfactory settlement of your indebtedness upon receipt of due notice then you cease to be entitled to the use of University facilities. You will not be permitted to register for a further session, to attend classes or examinations, or be granted any official credentials. In the case of a student enrolled for Session 1 only or for Sessions 1 and 2 this disbarment applies if any portion of fees is outstanding after the end of the eighth week of Session 1 (29 April 1977). In the case of a student 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 (2 September 1977).

In special cases the Registrar may grant exemption from disqualifications referred to in the preceding paragraph upon receipt of a written statement setting out all relevant circumstances.

Can I get an extension of time to pay?
If you apply before the due date and extenuating circumstances exist, an extension of time may be granted. Apply to the Deputy Registrar (Student Services).

Examinations

When are examinations held?
Examinations for Session 2 and for Full Year subjects are held in November/December. Examinations for Session 1 subjects are held during the Midyear Recess. Provisional timetables indicating the dates and times of examinations and notices of the location of examinations are posted on the central notice boards in the Biological Sciences Building, the Chancellery, Central Lecture Block, Dalton Building (Chemistry), Main Building (Mining and Physics), and in the Western Grounds Area on 10 May and 27 September. You must advise the Examinations Unit (Chancellery) of a clash in examinations by 23 May and 7 October. Final timetables are displayed and Individual copies are available for students on 7 June and 25 October.

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

In the assessment of your progress in University courses, consideration is 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.

How are examination passes graded?
Passes are graded: High Distinction, Distinction, Credit and Pass. A Pass Conceded may be granted to a student whose mark in a subject is slightly below the standard required for a pass but whose overall satisfactory performance warrants this concession.

A Terminating Pass may be granted where the mark for the subject is below the required standard. A terminating pass will not permit a student to progress further in the subject or to enrol in any other subject for which a pass in the subject is a co-requisite or pre-requisite. A student given a terminating pass may attempt a deferred examination, if available, to improve his performance but should he fail in such attempt, the terminating pass shall stand.

When are examination results available?
Final examination results will be posted to your term address (which can be altered up to 30 November) or to your vacation address (fill in a form obtainable at the Information Desk, Chancellery, also by 30 November). Results are also posted on School notice boards and in the foyer of the Sir John Clancy Auditorium. No examination results are given by telephone.

Can examination results be reviewed?
Examination results may be reviewed for a fee of $11 a subject, which is refundable in the event of an error being discovered. This review consists mainly of ensuring that all questions attempted have been marked and checking the total of the marks awarded. Applications for review must be submitted on the appropriate form to the Examinations and Student Records Section together with the necessary fee by the dates printed on the reverse side of Notification of Results.

Are allowances made if students are sick before or during an examination?
A student who through serious illness or other cause outside his control is unable to attend an examination is required to bring the circumstances (supported by a medical certificate or other evidence) to the notice of the Registrar not later than seven days after the date of the examination, and may be required to submit to medical examination.

A student who believes that his performance in a subject has been affected by serious illness during the year or by other cause outside his control, and who desires these circumstances to be taken into consideration in determining his standing, is required to bring the circumstances (supported by a medical certificate or other evidence) to the notice of the Registrar as soon as the circumstances are known but not later than seven days after the date of the examination.
All medical certificates should be as specific as possible concerning the severity and duration of the complaint and its effect on the student's ability to take the examinations.

A student who attempts an examination, yet claims that his performance is prejudiced by sickness on the day of the examination must notify the Registrar or Examination Supervisor before, during, or immediately after the examination, and may be required to submit to medical examination.

A student suffering from a physical disability which puts him at a disadvantage in written examinations should apply to the Registrar in writing for special provision when examinations are taken. The student should support his request with medical evidence.

Use of electronic calculators

Where the use of electronic calculators has been approved by a faculty or school, examiners may permit their use in examinations. Authorized electronic calculators are battery operated with the minimum operations of addition, subtraction, multiplication and division and are of a type in common use by university students. They are not provided by the University, although some schools may make them available in special circumstances.

How are examinations conducted?

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 ten minutes before the time for commencement.

3. No bag, writing paper, blotting paper, manuscript or book, other than a specified aid, is to be brought into the examination room.

4. No candidate shall be admitted to an examination after thirty minutes from the time of commencement of the examination.

5. No candidate shall be permitted to leave the examination room before the expiry of thirty minutes from the time the examination commences.

6. No candidate shall be re-admitted to the examination room after he has left it unless during the full period of his absence he has been under approved supervision.

7. A candidate shall not by any improper means obtain, or endeavour to obtain, assistance in his work, give, or endeavour to give, assistance to any other candidate, or commit any breach of good order.

8. Smoking is not permitted during the course of examinations.

9. All answers must be in English unless otherwise directed. Foreign students who have the written approval of the Officer-in-Charge of Examinations may use standard translation dictionaries.

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.

Under what circumstances are deferred examinations granted?

Deferred examinations may be granted in the following cases:

1. When a student through illness or some other acceptable circumstance has been prevented from taking the annual examination or has been placed at a serious disadvantage during the annual examinations.

2. To help resolve a doubt as to whether a student has reached the required standard in a subject.

3. To allow a student by further study to reach the required standard in a subject.

4. Where a student's progression or graduation is inhibited by his failure in one subject only, a deferred examination may be granted notwithstanding his failure otherwise to qualify for this concession.

In the Faculties of Arts, Commerce and Law special circumstances apply in the granting of deferred examinations. Details in each circumstance are given in the section Faculty Information in the respective handbooks for these faculties, or in the Calendar.

Deferred examinations must be taken at the centre at which the student is enrolled, unless he has been sent on compulsory industrial training to a remote country centre or interstate. In this case the student must advise the Registrar, on a form available from his school or the Information Desk, the Chancellery, of relevant particulars, before leaving for his destination, in anticipation that deferred examination papers may have to be forwarded to him. Normally, the student will be directed to the nearest university for the conduct of the deferred examination.

Can I buy copies of previous examination papers?

Yes—for 5c each from the Union Shop in the University Union.
Essays

Should I list my sources?

Students are expected to acknowledge the sources of ideas and expressions that they use in essays. To provide adequate documentation is not only an indication of academic honesty but also a courtesy enabling the marker to consult your sources with ease. Failure to do so may constitute plagiarism which is subject to a charge of academic misconduct.

Student Conduct on Campus

Is there a detailed code of rules related to the general conduct of students?

No. The University has not considered it necessary to formulate a detailed code of rules relating to the general conduct of students.

However, now that you have become a member of the University you should understand that this involves an undertaking on your part to observe its rules, by-laws and other requirements, and to pay due regard to any instructions conveyed by any officer of the University.

What are the rules related to attendance at classes?

You are expected to be regular and punctual in attendance at all classes in the course or subject in which you are enrolled. All applications for exemption from attendance at lectures or practical classes must be made in writing to the Registrar.

In the case of illness or of absence for some other unavoidable cause you 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.

Applications for exemption from lectures (leave of absence) should be addressed to the Registrar and, where applicable, should be accompanied by a medical certificate. If examinations have been missed, state this in your application.

If you fail a subject at the annual examinations in any year and re-enrol in the same course in the following year, you must include in your program of studies for that year the subject in which you failed. This requirement will not be applicable if the subject is not offered the following year; is not a compulsory component of a particular course; or if there is some other cause which is acceptable to the Professorial Board, for not immediately repeating the failed subject.

If you attend less than eighty per cent of your possible classes, you may be refused permission to sit for the examination in that subject.

Why is my University Union card important?

All students enrolled for courses leading to degrees and/or diplomas, except those exempt from fees, are issued with a University Union membership card. Your card must be carried during attendance at the University and shown on request.

The number appearing on the front of the card above your name is your student registration number used in the University's records. This number should be quoted in all correspondence.

The card must be presented when borrowing from the University libraries, when applying for travel concessions and when notifying a change of address. It must also be presented when paying fees on re-enrolment each year when it will be made valid for the year and returned. Failure to present the card could result in some inconvenience in completing re-enrolment.

If you lose your Union card it is important to notify the University Union as soon as possible.

New students will be issued with University Union cards on enrolment.

Why should I inform the University if I change my address?

If you change your address you should notify the Student Records Section of the Registrar's Division as soon as possible. Failure to do this could lead to important correspondence (including examination results) not reaching you. The University cannot accept responsibility if official communications fail to reach students who have not notified their change of address. Change of Address Advice Forms are available at Faculty and School offices and at the Information Counters on the Ground Floor of the Chancellery Building.

These will be accepted up to 30 November, except for final year students who may advise changes up to four weeks before their graduation ceremony.

Will the University release information to third parties without my permission?

In general, no. The University treats examination results 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, there are sometimes accusations made that the University has revealed information, including addresses (especially to insurance companies).
All students should be aware that students' addresses are eagerly sought by various commercial agents and that sometimes tricks are used to obtain them. For example, from time to time 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 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.

How are student records kept up to date?

Enrolment details forms will be sent to all students on 30 April and 30 August. It is not necessary to return these forms unless any information recorded thereon is incorrect. Amended forms must be returned to the Examinations and Student Records Section within fourteen days. Amendments notified after the closing date will not be accepted unless exceptional circumstances exist and approval is obtained from the Registrar. Amended forms returned to the Registrar will be acknowledged in writing within fourteen days.

Is there any rule related to the ownership of students' work?

Yes. 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 you as part of your courses, or submitted for any award or competition conducted by the University.

Can I get a permit to park on campus?

Only a limited amount of parking is available on campus. Copies of the University's parking rules may be obtained on application to Room 240, Chancellery Building.

Lost Property?

All enquiries concerning lost property should be made to the Superintendent on extension 3580 or to the Lost Property Office at the Union.

Further Information

Where can I get further information concerning courses, admission requirements, scholarships and enrolment procedure?
Introduction to
the Sciences Handbook

This handbook has been designed to assist understanding of the academic activities of three interrelated 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.

Several specialist courses of study, also leading to 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, with textbook lists, for units prescribed in the various regulations.
Faculty of Biological Sciences*

Staff

Comprises Schools of Psychology, Biological Technology, Biochemistry, Botany, Microbiology and Zoology.

Dean
Professor B. J. F. Ralph

Chairman
Professor S. H. Lovibond

Administrative Officer
Patrick James MacGinley, BA N.S.W.

Professional Officers
Rose Ann Varga, BSc N.S.W.
Peter Whaite, BE N.S.W.

Senior Tutors
Alan Robert Pierre Journet, BSc Wales, PhD McG.
Helen Patricia Ramsay, MSc PhD Syd.

Tutors
Alison Jean Gilbert, BAppSc Darling Downs I.A.E.
Carolyn Jean Jeffery, BSc Qld.
William Bernard Kilkeary, BSc Syd.
Gillian Sylvia Stephens, BScAgr Syd.

Professional Officer
Anthony Ross Smith-White, BSc Syd.

Research Assistant
Julia Steinborn, BSc Syd.

First Year Biology Teaching Unit

Director
Dr A. E. Wood

*Board of Studies in Science and Mathematics.
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: Applied Geology, Chemical Technology, Geography (Applied Science); History and Philosophy of Science, Philosophy, Sociology, Political Science (Arts); Economics (Commerce); Electrical Engineering, Mechanical and Industrial Engineering (Engineering); Anatomy, Community Medicine, Physiology and Pharmacology, Surgery (Medicine); Education (Professional Studies); and the Department of General Studies (Board of Studies in General Education).
School of Biochemistry

Professor of Biochemistry and Head of School
Edward Owen Paul Thompson, MSc DipEd Syd.,
PhD ScD Camb., ARACI

Professor of Biochemistry
Barry Vaughan Milborrow, BSc PhD DSc Lond., FLS, FIBiol

Professor of Medical Biochemistry
William James O'Sullivan, BSc W.Aust., PhD A.N.U.

Associate Professors
John Bruce Adams, MSc Syd., PhD N.S.W., ARACI
Keith Guenther Rienits, MSc Syd., PhD Birm.
Philip John Schofield, BSc PhD N.S.W.

Senior Lecturers
Kevin David Barrow, MSc PhD Adel.
Antony George Mackinlay, MSc PhD Syd.

Lecturers
Aldo Sebastion Bagnara, BSc PhD Melb.
Michael Richard Edwards, MA PhD Camb.
Ian James McFarlane, BSc PhD Syd.
Kenneth Edward Moon, BSc PhD N.S.W.
Thomas Stanley Stewart, BSc Syd., PhD N.S.W.
Roy Tirrell, BSc Syd., PhD N.S.W.
George Zalitis, BSc PhD W.Aust.

Senior Tutor
Jill Lorraine Gibbons, BSc Syd.

Tutors
Pamela Frances Como, BSc A.N.U.
Swee Leong Pun, BSc N.S.W.
Wayne Keith Willis, BSc N.S.W.

Teaching Fellows
David Pavin Chandra, BSc N.S.W.
Ming San Foo, BSc N.S.W.
Arthur Brian Jenkins, BSc Qld.
Peter Henry Leighton, BSc N.S.W.
Karen Kwat Har Li, BSc N.S.W.

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Wayne George Kelly, MSc N.S.W.
Choy Soong Daniel Lee, MSc N.S.W.
Andrew George Netting, BSc PhD N.S.W.

School of Biological Technology

Professor of Biochemistry and Head of School
Bernhard John Fredrich Ralph, BSc Tas., PhD Liv., FRACI

Associate Professor
Pamela Athelie Deidre Rickard, BSc Syd., MSc N.S.W.,
PhD Lond.

Senior Lecturer
Peter Lindsay Rogers, BE Adel., DPhil Oxon.

Lecturers
Noel William Dunn, MSc Melb., PhD Monash
Peter Philip Gray, BSc Syd., PhD N.S.W.
David Edward Tribe, BSc Melb.

Professional Officers
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Robert Barrie Doble, BSc N.S.W.
Ching Lien Wong, MSc PhD N.S.W.

School of Botany

Professor of Botany and Head of School
Derek John Anderson, BSc Nott., PhD Wales

Associate Professors
Mary Maclean Hindmarsh, BSc PhD Syd.
Haydn John Willetts, MSc Brist., PhD N.S.W.
School of Microbiology

Professor of Medical Microbiology and Head of School
Geoffrey Norton Cooper, MSc PhD Melb.

Professor of Microbiology
Kevin Charles Marshall, BScAgr Syd., MS PhD Corn.

Associate Professor
Anthony John Wicken, BSc PhD Cape T., MA Camb., FNZIC, ARIC

Lecturers
Yvonne Marie Barnet, BScAgr Syd., PhD N.S.W.
Iain Couperwhite, BSc PhD Strath.
Brian James Wallace, BSc PhD Melb.

Senior Tutor
Basil Patrick McBrien, MSc N.S.W., ASTC

Medical Microbiology

Senior Lecturers
Royle Anthony Hawkes, BScAgr Syd., PhD A.N.U.
Graham Douglas Fischer Jackson, BSc PhD Adel.
Adrian Lee, BSc PhD Melb.

Senior Tutor
Elizabeth Hazel Hegarty, MSc Qld.

Tutors
Hazel Marjory Young, BSc Strath.
Nerissa Glenda Hartwig, BSc Adel.

Honorary Associate (School)
Phyllis Margaret Rountree, DSc Melb., DipBact Lond.

School of Psychology

Professor of Psychology and Head of School
Laurence Binet Brown, MA DipEd N.Z., PhD Lond.

Professor of Psychology

Professor of Psychology
Vacant
Associate Professor
Donald McNicol, BA *Adel.*, PhD *Camb.*

Administrative Officer
Trevor John Clulow, BA *N.S.W.*

Senior Lecturers
Stephen Bochner, BA *Syd.*, MA *Hawaii*, PhD *N.S.W.*
Alexander Edward Carey, BSc *Lond.*
Evan Edwin Davies, MA *Syd.*, PhD *N.S.W.*
Keith Raymond Llewellyn, BA PhD *Syd.*

Lecturers
Kevin Douglas Bird, BSc PhD *N.S.W.*
James Christopher Clarke, MA N.Z., PhD N.Y. State (Stony Brook)
Patrick John Cleary, BSc Qld., PhD N.S.W.
Sydney Engelberg, BA Rand., MS Hebrew Univ. of Jerusalem, MA PhD N.Y. State
Austin Sorby Faust-Adams, BA *Adel.*, MA PhD *Mich.*
William Taylor Hardy, BA *Claremont*, MA PhD Calif.
William Hopes, BA *Syd.*
Edward James Kehoe, BA *Lawrence*, MA PhD *Iowa*
Charles Porter Kenna, BA BSc *Syd.*
Thomas Angus McKinnon, MA PhD *Syd.*
John Cunningham Murray, BA *Syd.*
George Paxinos, AB *Calif.*, MA PhD *McG.*
John Eaton Teplin, BSc PhD *Adel.*
Reginald Frederick Westbrook, MA Glas., DPhil Sus.

Teaching Fellow
Luther Coleman Jones, BS *Texas*

Tutors
William Gordon Adams, BSc *N.S.W.*
Peter James Brandon, BA *N.S.W.*
Elizabeth Anne Kennedy, BA *Syd.*
Carmen Christine Moran, BA *N.S.W.*
Frank Rowland Pace, BA W.Ont., MA *Sask.*
Glenn Peter Richard, BSc *Glas.*
Sherrill Spears, BA *N.S.W.*
Vaegen, BA *Syd.*, MSc *Monash*
Shirley Anne Walls, BA *N.S.W.*
Marie Jeanette Waterhouse, BA *Melb.*

Graduate Assistants
June Rosemary Martin, MSc *N.S.W.*
Noel Margaret Wilton, BSc *N.S.W.*

Professional Officer
Angus John Fowler, BSc *N.S.W.*
Faculty of Science

Staff

Comprises Schools of Chemistry, Mathematics, Optometry and Physics.

Dean
Professor S. J. Angyal

Chairman
Professor R. M. Golding

Director of Studies in Science
Associate Professor L. G. Parry

Graduate Assistant
Emma Shackleton Rossi, BA Syd.

Professor
George William Kenneth Cavill, MSc Syd., PhD DSc Liv., FAA, FRACI

Professor of Theoretical and Physical Chemistry and Head of Department of Physical Chemistry
Raymund Marshall Golding, MSc Auck., PhD Camb., FNZiC, FInstP, FRACI

Professor** and Head of Department of Inorganic Chemistry
Stanley Edward Livingstone, PhD DSc N.S.W., FSTC, FRACI

Professor of Analytical Chemistry and Head of Department of Analytical Chemistry
Lloyd Earle Smythe, MSc Syd., PhD Tas., FRACI

School of Chemistry

Professor of Chemistry and Head of School
James Stanley Shannon, DIC, PhD Lond., DSc Adel., FRACI

Professor of Organic Chemistry
Stephen John Charles Angyal, PhD Bud., DSc N.S.W., FAA, FRACI

*Board of Studies in Science and Mathematics.
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: Applied Geology, Chemical Technology, Geography (Applied Science); History and Philosophy of Science, Philosophy, Sociology, Political Science (Arts); Economics (Commerce); Electrical Engineering, Mechanical and Industrial Engineering (Engineering); Anatomy, Community Medicine, Physiology and Pharmacology, Surgery (Medicine); Education (Professional Studies); and the Department of General Studies (Board of Studies in General Education).

**In the field of inorganic chemistry.
†In the field of organic chemistry.
Executive Assistant to Head of School
William John Dunstan, MSc Syd., ARACI

Senior Administrative Officer
Ralph Sutton, MVO, AFAIM, psc

Honorary Associates
Lister George Clark, ASTC, ARACI, FAIFST
John Archer Mills, MSc Adel., PhD Camb., FRACI
Neville Charles Stephenson, MSc Syd., PhD DSc N.S.W., FRACI

Professional Officers
James Bell, BE N.S.W., ASTC
Anthony Yook Ming Chung, BE Tas.
Donald Chadwick Craig, BSc Syd., MSc N.S.W.
Vladimir Djohadze, BSc N.S.W.
Richard James Finlayson, BSc N.S.W., ARACI
Peter Anthony James, BSc N.S.W., ASTC, ARACI
Derek Nelson, BSc DipEd Belf.
Victor Arthur James Pickles, MSc N.S.W., ASTC, ARACI
James Francis Rockwell, BSc N.S.W., ASTC
Robert Bruce Rogers, BSc N.S.W., ARMTC
Graeme Thomas See, BSc N.S.W., ASTC
John Sussman, BSc Syd.
Oen Bin Tio, BE N.S.W.
Michael Keys Withers, MSc N.S.W.

Staff

Department of Analytical Chemistry

Associate Professor
Douglas Peter Graddon, MSc PhD Manc., FRIC

Senior Lecturers
Peter William Alexander, MSc PhD Syd., ARACI
Ian Kelvin Gregor, BSc N.E., MSc PhD N.S.W.
Ewan Cameron Martin, MSc PhD N.S.W., ASTC, FRACI

Lecturers
Sergio Dilli, BSc PhD N.S.W., ASTC, ARACI
Jaroslav Petr Matousek, MSc T.U.(Prague), ARACI

Teaching Fellow
Vyt Peter Garnys, BSc W.Aust., ARACI

Department of Applied Organic Chemistry

Associate Professor and Head of Department
Edward Ritchie Cole, MSc Syd., PhD N.S.W., FAIFST

Senior Lecturer
George Crank, MSc Qu., PhD Monash

Lecturers
Norman William Herbert Cheetham, BSc PhD Qld
Peter Thomas Southwell-Keely, BSc Syd., PhD N.S.W.

Department of Inorganic Chemistry

Associate Professor
Harold Andrew Goodwin, BSc PhD Syd., ARACI

Senior Lecturers
James Roy Backhouse, MSc Syd., PhD N.S.W.
Ian Gordon Dance, MSc Syd., PhD Manc., ARACI
David John Phillips, BSc PhD Lond., ARACI

Lecturer
Benjamin Sidney Morris, MSc Syd., ARACI

Department of Nuclear and Radiation Chemistry

Associate Professor and Head of Department
Douglas John Carswell, MSc PhD DipEd Syd., FRACI

Senior Lecturers
Norman Thomas Barker, MSc PhD N.S.W.
Mervyn Allan Long, MSc PhD Auck., ANZIC

Tutor
Anu Mihkelson, MSc N.S.W., PhD Syd.
Department of Organic Chemistry

Associate Professor and Head of Department
Ronald Arthur Eade, MSc Syd., PhD Liv., FRACI

Associate Professors
Peter Steele Clezzy, BSc PhD Tas., ARACI
Robert Jack Louis Martin, MSc Melb., PhD Lond., ARACI
John Johnson Henry Simes, MSc DipEd Syd., PhD Liv., FRACI

Senior Lecturers
John Lawrence Courtney, BSc PhD N.S.W., ASTC, ARACI
William John Dunstan, MSc Syd., ARACI
Michael John Gallagher, MSc Qld., PhD Camb., ARACI
John David Stevens, BSc Tas., PhD N.E., ARACI

Lecturer
George Vernon Baddeley, BSc Manc., DPhil Oxon.

Senior Tutor
Inno Salasoo, BSc PhD N.S.W., ASTC, ARACI

First Year Chemistry

Director of First Year Classes in Chemistry
June Clare Griffith, MSc N.S.W., PhD Syd.

Senior Lecturer
Norman Robert Davies. BSc PhD Lond., FRIC

Lecturers
Roger Bishop, BSc And., PhD Camb.
Clive Reginald Taylor, BSc Syd.

Senior Tutor
Peter See Kien Chia, MSc PhD N.S.W.

Tutors
Victor Chen-Teh Bien, MSc Syd.
Nguyen Quang Minh, BSc PhD N.S.W.

Teaching Fellow
Mohammad Akhtar Malik, MSc Panj.

Department of Physical Chemistry

Associate Professor
John Lyndon Garnett, MSc N.S.W., PhD Chic., ASTC, ARACI

Senior Lecturers
Gregory Stewart Buchanan, MSc Syd., ARACI
Brian Raymond Craven, MSc PhD N.S.W., ASTC
Tristan John Victor Findlay, BSc PhD St. And., ARACI
William David Johnson, BSc Syd., MSc N.E., PhD N.S.W.
Prosper David Lark, BEc Syd., MSc PhD N.S.W., ASTC, ARACI
Brian John Orr, MSc Syd., PhD Brist., ARACI

Lecturers
David Scott Alderdice, MSc Syd., PhD Lond.
Ruby Foon, MSc PhD Melb.
Alan David Rae, MSc PhD Auck., ANZIC

Senior Tutor
Martin Peter Bogaard, BSc PhD Syd.

School of Mathematics

Professor of Theoretical and Applied Mechanics and Head of School
Viliam Teodor Buchwald, BSc Manc., MSc PhD Lond., FIMA

Professor of Applied Mathematics
John Markus Blatt, BA Cinc., PhD Corn. and Prin., FAA, FAPS

Teaching Fellow
Russell Clive Cowell, BSc Syd.
Staff

Professor of Pure Mathematics
Gavin Brown, MA St. And., PhD N’cle.(U.K.)

Professor of Statistics
Abraham Michael Hasofer, BEE Faruk, BEc PhD Tas., MIEAust

Professor of Pure Mathematics
*George Szekeres, DiplChemEng Bud., FAA

Director of First Year Studies
Associate Professor Angus Henry Low, MSc DipEd Syd., PhD N.S.W.

Executive Assistant to Head of School
Douglas Edward Mackenzie, BSc Tas.

Administrative Assistant
Pamela Jean Monk, BSc N.E.

Professional Officer
Loy Tong Yeo, BSc BE N.S.W.

Department of Pure Mathematics

Associate Professor
Alfred Jacobus van der Poorten, BA BSc PhD MBA N.S.W.

Senior Lecturers
Peter Windeyer Donovan, BA BSc Syd., DPhil Oxon.
Jack David Gray, BA Syd., PhD N.S.W.
Ezzat Sami Noussair, BA BSc Cairo, PhD Br.Col.
John Frederick Price, MSc Melb., PhD A.N.U.
John St. Alban Sandiford, MSc Syd.

Lecturers
Charles Dixon Cox, BSc DipEd Qld.
Shaun Anthony Requa Disney, BA Adel., DPhil Oxon.
Mary Ruth Freischl, BA Rand., MA N.S.W.
Michael Gillingham Greening, MA Lond.
David Christopher Hunt, BSc Syd., MSc PhD Warw.
Rodney Kelvin James, BSc PhD Syd.
John Harold Loxton, MSc Melb., PhD Camb.
Ronald William Ramsay, BSc PhD Monash
David Graham Tacon, BSc N’cle.(N.S.W.), PhD A.N.U.

Senior Tutors
Michael David Hirschhorn, BSc Syd., MSc Edin.
Agnes Vilma Nikov, DiplMath DipEd Bud.

Tutors
Gregory Karpilovsky, Dipl Uzhgorod, DiplPhD Kharkov
Richard Nicholas Reddan, BSc Qld.

Honorary Associate
Gregory Maxwell Kelly, BSc Syd., BA PhD Camb., FAA

Department of Applied Mathematics

Associate Professors
Ian Hugh Sloan, BA BSc Melb., MSc Adel., PhD Lond.
William Eric Smith, MSc Syd., BSc Oxon., PhD N.S.W., MInstP

Senior Lecturers
Elvin James Moore, MSc W.Aust., PhD Harv.
Kazuto Okamoto, BS Tokyo, PhD Louisiana State

Lecturers
Michael James Barber, BSc N.S.W., PhD Corn.
Brian James Burn, MSc Otago, PhD Camb.
Alexander Hugh Opie, BSc DipEd Melb., PhD Monash
Kok-Lay Teo, BSc Sing., MASc PhD Ott., MIEEE, AMIEE

Senior Tutors
Mandel Brender, BSc McG.
Felicity Alison Dewar, BSc Qu.

Tutors
Cameron Kidd, BSc Syd.
Jan Dennis Newmarch, BSc Brist.

Department of Statistics

Associate Professor of Mathematical Statistics
James Bartram Douglas, MA BSc DipEd Melb.

*Retired from the University 31 December 1976.
Associate Professor
Clyde Arnold McGilchrist, BSc BEd Qld., MSc PhD N.S.W.

Senior Lecturers
Anthony Gilbert Lewis Elliott, BSc W.Aust.
Marek Kanter, BA Rice, PhD Calif.
Phillip Joseph Staff, BSc DipEd Syd., MSc PhD N.S.W.
Manohar Khanderao Vagholkar, DIC. MSc Bom., PhD Lond.

Lecturers
Peter John Cooke, MSc N.E., MS PhD Stan.
Ronald Bruce Davis, BSc Syd., MSc N.S.W., DipEd N.E.
John Anthony Eccleston, BSc Syd., MSc Man., PhD Corn.

Tutor
Nelson Shik Yin Tsang. BSc N.E.

Professional Officer
Rhonda Gock, BSc N.S.W.

Honorary Associate
Alan John Miller, MSc PhD Manc., FSS

School of Optometry*

Professor of Optometry and Head of School
Josef Lederer, BSc Syd., MSc N.S.W., ASTC, FIO

Associate Professor
George Amigo, BSc(OptSc) PhD N.S.W., ASTC, FIO, FAAO

Senior Lecturers
Brien Anthony Holden, BAppSc Melb., PhD City, LOSc VCO(Melb), FAAO
Maxwell McNeil Lang, BSc PhD N.S.W., ASTC, FIO, FAAO, MAIP

Lecturers
John Andrew Alexander, MSc N.S.W., ASTC, FIO, FAAO
Stephen John Dain, BSc PhD City, FBOA
Graham Leslie Dick, MSc N.S.W., ASTC, FIO

Professional Officer
Angela Kathleen McCarthy, ASTC, FIO

Tutors
David Cecil Pye, BOptom N.S.W.
Bernard Peter Tan, BSc(Optom) Melb., LOSc VCO(Melb)

Instructor
Ian William Robinson

*Established from 1 January 1977. Formerly part of School of Applied Physics and Optometry, whose Head of School and Professor of Applied Physics, Christopher John Milner, MA PhD Camb., FInstP, FAIP, retired from the University 31 December 1976.
School of Physics

Professor of Physics and Head of School
Eric Paul George, BSc PhD Lond., DSc N.S.W., FInstP, FAIP

Professor of Experimental Physics and Head of Department of Applied Physics
Hiroshi Julian Goldsmid, BSc PhD DSc Lond., FInstP, FAIP

Professor of Experimental Physics
Kenneth Norman Robert Taylor, BSc PhD Birm., FInstP

Professor of Theoretical Physics and Head of Department of Theoretical Physics
Heinrich Hora, DipPhys Halle, DrRerNat Gena, FAIP

Professor of Applied Physics
Vacant

Associate Professors
Hans Gerald Leonard Coster, MSc PhD Syd., MInstP, MAIP
Dan Haneman, DSc Syd., PhD R’dg., FAIP
John Charles Kelly, BSc Syd., PhD R’dg., FInstP, MAIP
Jack Foster McConnell, MSc Syd., PhD N.S.W., MInstP, MAIP
Lindsay George Parry, BSc DipEd Syd., MSc PhD N.S.W., MInstP, MAIP

Executive Assistant to Head of School
Kenneth Mann, BSc Qld., MSc N.S.W.

Director of First Year Studies
Dr G. J. Russell

Senior Administrative Officer
Cyril Charles Rosario

Senior Lecturers
Graham James Bowden, BSc DipAdvStudSc PhD Manc.
John Eric Giutronich, BSc Syd., PhD N.S.W., MAIP
Colin Trevor Grainger, BSc DipEd Syd., MSc N.E., PhD N.S.W., MInstP, MAIP
Norman Reginald Hansen, BSc DipEd Syd., MSc N.S.W., MInstP, MAIP
Eric Harting, BSc PhD N.S.W., ASTC
Graeme John Russell, BSc PhD N.S.W., GradInstP, GradAIPE
Raymond Garry Simons, BSc Syd., MSc Tel Aviv, PhD N.S.W.

Lecturers
Peter Russel Elliston, BSc Melb., PhD Monash
Veronica Jean James, BA BSc Qld., PhD N.S.W., MAIP
Kenneth Huile Marsden, BSc Lond., MSc N.S.W., MInstP, MAIP, ARCS
Peter Mitchell, BSc PhD Adel., MAIP
George Lage Paul, MSc Syd., PhD Edin., MAIP
James Martin Pope, MSc Brist., DPhil Sus., AInstP
Andrew Morven Stewart, DIC, MA Camb., AM Harv., EE Col., PhD Lond., MInstP, MIEEE

Senior Tutors
Ian Richard Dunn, BSc BA Melb., MIEEE
Edward Peter Eyland, BSc MPhysics N.S.W., BD Lond.
Martin Desmond Knight, BSc N.S.W.

Tutors
Robert Geoffrey Ashcroft, BSc Syd.
Kenneth Richard Doolan, BSc Syd.
Walter Kelceff, BSc DipEd Syd.
Phillip Andrew Miles, BSc N.S.W.
Paul Michael O’Halloran, BA Macq., GradAIPE
John Dorsett Smith, BSc Indiana S.U.
John Robert Smith, BSc Syd.

Teaching Fellows
Robert Leendert Calvert, BSc S’ton, MSc Qu.
Kevin Charles Fitzsimmons, BSc Syd.
Prem Darkash Narang, MSc Delhi
Ahmed Abdul Rahman, BSc Qld., MSc N.S.W.
Janis Lee Van Doorn, BSc Adel.

Professional Officers
Peter Robert Barker, BSc Monash
Robert Louis Dalgleish, BSc PhD N.S.W.
Fredericus Gerardus Majella Steenbeke, DiplMechEng Arnhem T.H.
Peter Claydon Young, BE N.S.W.I.T., GradIEAust

Honorary Associates
John Stuart Dryden, DIC, MSc Melb., PhD Lond., FAIP
Gordon Hay Godfrey MA BSc Syd., FInstP, FAIP, Hon.FIO
John Lloyd Symonds, BSc Adel., PhD Birm., FInstP, FAIP
Guy Kendall White, MSc Syd., DPhil Oxon., FAA, FInstP, FAIP

Honorary Visiting Fellows
Victor Kastalsky, BSc PhD N.S.W., ASTC, MInstP, MAIP
Department of Applied Physics*

Associate Professors
Brian Ronald Lawn, BSc PhD W.Aust., GradInstP
David Henry Morton, MA Oxon., FInstP, FAIP
Howard Frank Pollard, MSc W.Aust., PhD N.S.W., MInstP, MAAS, MASA, MAIP

Senior Lecturers
John Ian Dunlop, BSc PhD N.S.W., MAIP, MAASATI
John Robert Hanscomb, BSc Qld., MSc PhD N.S.W., MAIP, GradInstP
Leslie Bevan Harris, BSc Lond., BA DipEd Durh., PhD N.S.W., AIM, AInstP
Victor Raymond Howes, BSc PhD Lond.

Lecturers
Kenneth Mann, BSc Qld., MSc N.S.W.

Tutors
Vu Van Hoi, BSc BE N.S.W.

Department of Theoretical Physics

Senior Lecturers
Jaan Oitmaa, BSc PhD N.S.W., MAIP

Lecturers
David Neilson Lowy, BSc Melb., MS PhD N.Y.State
John Richard Shepanski, MSc Syd., MAIP

Teaching Fellow
Ting Hun Ho, BSc H.K.

*Established within the School of Physics from 1 January 1976. Formerly part of School of Applied Physics and Optometry.
Broken Hill Division

Staff

Director
Professor J. E. Andersen

W.S. and L.B. Robinson University College

Director and Head of Department of Science
Professor John Everard Andersen, BE Melb., PhD N.S.W., FIEAust, MAusIMM, ARACI

Head of Department of Mining and Mineral Sciences
Professor Leon John Thomas, BSc PhD Birm., CEng, FIEAust, MAusIMM, MIMinE

Administrative Officer
Peter Francis Hern, AASA

Professional Officer
Boyd Parker Watson, BSc(Tech) N.S.W.

Department of Mining and Mineral Sciences

Mechanical Engineering

Lecturers
Llewellyn Ramsay Jones, BSc N.Z., DipAm MEng Shelf., PhD Wales, MIEAust, MIMechE

Ian Lachlan Maclaine-cross, BE Melb., MIEAust, MAIRAH, MSES
Chakravarti Varadachar Madhusudana, BE Mys., ME B'lore, PhD Monash, MIEAust

Mining Engineering

Lecturer
Venkata Satyanarayana Vutukuri, BSc(Eng) Ban., MS Wis., MMGI, AIME, AMAusIMM

Professional Officer
Kenneth James Murray, BSc Syd., MSc N.S.W., AMAusIMM

Mineral Science

Senior Lecturer
Barenya Kumar Banerji, MSc Patna, PhD Leeds, MAusIMM

Geology

Senior Lecturer
Gerrit Neef, BSc Lond., PhD Well., FGS, AMAusIMM

Lecturers
Ian Rutherford Plimer, BSc N.S.W., PhD Macq., AMAusIMM, AMIMM
Kevin David Tuckwell, BSc PhD N.S.W., AMAusIMM

Tutor
Alaster Carlile Edwards, BSc Melb., GSA, AMAusIMM
Department of Science

Chemistry

Associate Professor
Keith George O'Brien, MSc Syd., PhD N.S.W., FRACI, AMAusIMM

Lecturer
Derek Richard Smith, BSc PhD Wales

Senior Tutor
Robert Edward Byrne, MSc N.S.W., ARACI, AMAusIMM

Mathematics

Lecturers
David Charles Guiney, BSc PhD Adel.
Zdenek Kviz, Dip Phys Brno, CSc RerNatDr Charles, PhD Prague
Dennis William Trenerry, BSc PhD Adel.

Physics

Lecturers
Robert John Stening, MSc Syd., PhD Qld., MAIP
Kenneth Reid Vost, BSc Glas., MSc N.S.W., AMAusIMM

Fowlers Gap Research Station

Officer-in-Charge
Ian Hugh Auldist, BAgSc Melb., MAIAS
Faculty Information

Faculty of Biological Sciences
Enrolment Procedures*

Preliminary Enrolment
BSc Course in Psychology

Each student must obtain his or her personal enrolment form and Personal Program Form P/RE from the School Office, Room 1011, Sciences Building. The forms will be available from 12 October 1976. After notification of the annual examination results the student should indicate the subjects already completed and the proposed program for 1977 on Form P/RE and forward this, together with the enrolment form (completed except for the entry of subjects) to reach the Administrative Officer, School of Psychology, not later than Friday 14 January 1977.

Students who are unable to attend personally should send a representative at the specified time with a letter of authority to collect their form for them.

Enrolment Timetable

School of Psychology

BSc Course in Psychology students must attend for re-enrolment at the School of Psychology, The Sciences Building, as follows:

Year 2 and Year 1 repeats
Tuesday 1 March
10.00 am to 12.00 noon

Year 3 and 4
Tuesday 1 March
2.00 pm to 4.00 pm

Geography Subjects

Students enrolling or re-enrolling in Geography subjects are to attend Hut 7 on one of the following dates:

Monday 28 February
10.00 am to 12.00 noon
2.00 pm to 4.00 pm

Wednesday 2 March
10.00 am to 12.00 noon
2.00 pm to 4.00 pm
6.00 pm to 8.00 pm

Friday 4 March
10.00 am to 12.00 noon
2.00 pm to 4.00 pm

Monday 7 March
10.00 am to 12.00 noon
2.00 pm to 4.00 pm

in order to obtain class admission cards and to be allocated places in tutorials and laboratories.

Enrolment Centre

School of Psychology
Room 1021
The Sciences Building

* As a result of a decision by the Commonwealth Government, no tuition fees are charged in 1977.
Faculty of Science
Enrolment Procedures*

Preliminary Enrolment

Pure and Applied Chemistry Course

Before the end of Session 2 each student must attend the School Office to complete the necessary preliminary enrolment procedures.

Enrolment forms must be completed as far as possible and left with the School Office.

Enrolment Timetable

Pure and Applied Chemistry Course

Students in the course are required to attend Unisearch House in accordance with the following timetable:

1. Full-time Course
   Year 2, & Year 1 repeats  Monday 28 February
   2.00 pm to 4.30 pm
   Year 3  Wednesday 2 March
   9.30 am to 12.30 pm
   Year 4  Friday 4 March
   9.30 am to 11.00 am

2. Part-time Course
   Stage 1 repeats & Stages 2, 3 and 4  Tuesday 1 March
   2.00 pm to 4.00 pm
   6.00 pm to 8.00 pm
   Stages 5, 6 & later  Wednesday 2 March
   2.00 pm to 5.00 pm

3. New Students with Advanced Standing  Wednesday 2 March
   3.30 pm to 5.00 pm

Optometry Course

Students enrolling in Year 2 of the B Optometry course are requested to bring with them a recent passport size photograph with their name and address printed on the back.

All students are required to attend Unisearch House, 221 Anzac Parade (across from Main Campus) in accordance with the following timetable:

Year 2, & Year 1 repeats  Monday 28 February
   2.00 pm to 4.30 pm

Year 3 and Year 4  Tuesday 1 March
   2.00 pm to 4.30 pm

Science and Mathematics Course

See Board of Studies in Science and Mathematics

Geography Subjects

As for Faculty of Biological Sciences. See previous page, column 2.

General Studies

Students enrolling in general studies electives after completing enrolment in their own Faculty and BEFORE GOING TO THE CASHIER, should proceed to the General Studies enrolment centre in Unisearch House where they will obtain places in electives, complete class admission cards and finalize enrolment forms.

Enrolment Centre

Pure and Applied Chemistry  Unisearch House
Optometry  221 Anzac Parade
   (across from Main Campus)

Board of Studies in Science and Mathematics Enrolment Procedures*

Preliminary Enrolment

Science and Mathematics Course

Before the end of Session 2, each student must obtain a 1977 Program Form (Form SC77), 1977 timetables and instruction sheets from the Science and Mathematics Course Office.

After notification of the annual examination results, the student should complete Form SC77 and lodge it at the Science and Mathematics Office not later than 14 January 1977. Students whose Program Forms are not received by 14 January 1977 must re-enrol at a late re-enrolment session.

Enrolment Timetable

Science and Mathematics Course

After fulfilling preliminary enrolment requirements, students should complete their re-enrolment at Unisearch House in accordance with the following timetable:

Year 2, & Year 1 repeats  Monday 28 February
   2.00 pm to 4.30 pm

Year 3 and Year 4  Tuesday 1 March
   2.00 pm to 4.30 pm

* See footnote on previous page.
Full-time Course
Year 2 & Year 1 Repeats
Surnames A to G
Surnames H to M
Surnames N to R
Surnames S to Z
Year 3
Surnames A to J
Surnames K to R
Surnames S to Z
Year 4
All students
New Students with Advanced Standing
Full-time Course
Year 2 & Year 1 Repeats
Surnames A to G
Surnames H to M
Surnames N to R
Surnames S to Z
Year 3
Surnames A to J
Surnames K to R
Surnames S to Z
Year 4
All students
New Students with Advanced Standing
Week 2 March
9.30 am to 12.30 pm
2.00 pm to 4.30 pm
Thursday 3 March
9.30 am to 12.30 pm
2.00 pm to 4.30 pm
Monday 28 February
2.00 pm to 4.30 pm
Tuesday 1 March
9.30 am to 12.30 pm
2.00 pm to 4.30 pm
Friday 4 March
9.30 am to 12.30 pm
2.00 pm to 4.30 pm
Tuesday 1 March
6.00 pm to 8.00 pm
Tuesday 1 March
6.00 pm to 8.00 pm
Thursday 3 March
6.00 pm to 8.00 pm
Thursday 3 March
6.00 pm to 8.00 pm
First Late Enrolment Period
Wednesday 9 March
Second Late Enrolment Period
Wednesday 16 March
The times and locations for late enrolment in the Faculties and Board referred to in this handbook are:
Faculty of Biological Sciences
School of Psychology
Level 10
The Sciences Building
4.00 pm to 6.00 pm
Faculty of Science
Pure and Applied Chemistry Course
The Robert Heffron Building
Room 111, First Floor
5.00 pm to 7.00 pm
Optometry Course
The Newton Building
3rd Floor, Room 327
1.00 pm to 2.00 pm
Board of Studies in Science and Mathematics Course
Room 14 (Conference Room)
Main Building
Wednesday 9 March only
5.00 pm to 7.00 pm
Formal Masters Courses and Graduate Diploma Courses
At Office of appropriate School
The Biomedical Library
This library is situated on Levels 2 and 3 of the Science Building annex. It aims to serve the specialised reference and research needs of staff, graduate students and undergraduate students in the Biological Sciences.
Trained staff are available at all times in the Biomedical Library to assist staff and students in making best use of the library.

Enrolment Centre
Science and Mathematics
Unisearch House
221 Anzac Parade
(across from Main Campus)

Geography Subjects
As for Faculty of Biological Sciences. See two pages earlier, column 2.

General Studies
As for Faculty of Science. See previous page, column 2.

Enrolment Centre
Science and Mathematics
Unisearch House
221 Anzac Parade
(across from Main Campus)
The Physical Sciences Library
This library serves the information needs of senior undergraduate students, graduate students, and members of the academic staff. It contains books, a large collection of journals, guides to the use of the literature such as abstracting and indexing journals in the subject areas of pure and applied science, technology, engineering and architecture. The library also houses a growing map collection and some microform material. All material housed in the library bears the prefix 'P' and is indexed in the library's central catalogue on Level 2. There is also a catalogue in the Physical Sciences Library. The library seats approximately 300 and a number of room carrels and seminar rooms are available for use. Photocopying facilities are provided. Journals may not be borrowed from the collection. Library staff are ready to assist readers with their enquiries.

The Undergraduate Library
This library caters for the library needs of first and second year students and other groups where large numbers require mass teaching.

It provides a reader education programme and reader assistance service aimed at teaching students the basic principles of finding information.

Services of particular interest to undergraduates and academic staff are:

- The Open Reserve Section, housing books and other material which are required reading.
- The Audio-Visual Section, containing cassette tapes, mainly lectures and other spoken word material. The Audio-Visual Section has wired study carrels and cassette players for student use.

Biomedical Librarian  George Franki  
Physical Sciences Librarian  Janine Schmidt  
Undergraduate Librarian  Pat Howard

Statistical Society of Australia: New South Wales Branch

The Branch offers student membership to undergraduates who are following a recognised course of study which includes Statistics. The subscription for a student member is $5 per annum.

The regular general meetings of the Branch are held usually on the second Thursday of each month from March to November. 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.

Applications and requests for further information should be sent to the Hon. Secretary, Dr G. H. Cooney, Department of Mathematical Statistics, University of Sydney 2006.

The Psychology Society

The Psychology Society aims to provide activities both educational and social for students of psychology, and, more generally, to act as an intermediary body between students and staff. While psychology is one of the most popular subjects available, many students have only a vague conception of psychology and are unsure where their courses will lead them.

One of the aims of the Psychology Society is to provide information relevant to these matters. Last year a highly successful careers seminar was held, in which speakers from various areas of psychological practice discussed requirements and opportunities in their respective fields. In a School so large it is difficult to develop a meaningful degree of personal contact between students of different years and students and staff. The Society attempts to provide opportunities for such contact, to foster staff-student relations and to act in the interest of psychology students as a whole. Accordingly, we hope to include such items as staff-student luncheons, informal discussions and theatre parties. On the educational side there are film showings and occasional talks and seminars (eg, on careers, course requirements, etc). An activities fee enables the committee to meet any of the finances needed to support its functions.

Financial Assistance to Students

The scholarships and prizes listed below are available to students whose courses are listed in this handbook.

A similarly oriented list appears in the Faculty Information section of each of the faculty handbooks.

The complete list of University scholarships and prizes appears in the General Information section of the Calendar.
Scholarships

Undergraduate Scholarships

As well as the assistance mentioned earlier in this handbook (see General Information: Financial Assistance to Students), there are a number of scholarships available to students. What follows is an outline only. Full information may be obtained from the Student Employment and Scholarships Unit, 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.

<table>
<thead>
<tr>
<th>Donor</th>
<th>Value</th>
<th>Year/s of Tenure</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bursary Endowment Board*</td>
<td>$300 pa if living at home; $400 pa if living away from home</td>
<td>7 years</td>
<td>Merit in HSC and total family income not exceeding $4000</td>
</tr>
<tr>
<td>Sam Cracknell Memorial</td>
<td>$1000 to $1500 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 either directly or administratively; and financial need</td>
</tr>
<tr>
<td>Air Force Association Memorial Scholarship</td>
<td>$250 pa</td>
<td>1 year renewable for the duration of the course subject to satisfactory progress</td>
<td>Child of member or former member of Royal Australian Air Force undertaking a full-time degree course</td>
</tr>
</tbody>
</table>

Biological Sciences

Biological Technology

| Mauri Brothers & Thomson Ltd               | $1000 pa                                   | 1 year           | Eligibility for admission to the honours year of the full-time degree course in Biological Technology |

Science

| Mathematics                                | $600 pa                                    | 2 years subject to satisfactory progress | Eligibility for admission to third year of the full-time course leading to the degree of Bachelor of Arts or Bachelor of Science majoring in Mathematics or Statistics |

*Apply to The Secretary, Bursary Endowment Board. Box 7077, GPO, Sydney 2001 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>Optometry</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Australian Optometrical Association</td>
<td>$250 pa for 1st year of the course $500 pa for 2nd and later years of the course</td>
<td>1 year renewable for the duration of the course subject to satisfactory progress</td>
<td>Permanent residence in Australia and eligibility for admission to the full-time degree course in Optometry</td>
</tr>
<tr>
<td>The Australian Optometrical Association (NSW Division)</td>
<td>$500 pa</td>
<td></td>
<td>Residents of NSW under the age of 21 who are eligible for admission to the full-time degree course in Optometry</td>
</tr>
<tr>
<td>Gibb &amp; Beeman (Spectacle Makers) Pty Ltd</td>
<td>$500 pa</td>
<td></td>
<td>Permanent residents of NSW intending to practice optometry in NSW who are eligible for admission to the fourth year of the full-time degree course in Optometry</td>
</tr>
<tr>
<td>Optometric Associates Co-operative Limited</td>
<td>$250 pa</td>
<td>1 year</td>
<td></td>
</tr>
</tbody>
</table>

Graduate Scholarships

Applications for scholarships should be made in triPLICATE on the required form, and sent to the Registrar by 31 October. Eligibility depends on such factors as the applicant holding an honours degree or equivalent qualification, or having relevant experience. Students completing the final year of a course may apply. Those under bond should disclose this fact. Awards are tenable for one year, and may be renewed for a maximum of two years for a Masters and 3 to 4 years for a PhD degree. Renewal each year is subject to satisfactory progress. Any exceptions from these requirements are indicated.

Application forms and further information are available from the Student Employment and Scholarships Unit, which is located on the ground floor of the Chancellery. This Unit produces the booklet Graduate Awards, and also provides information on additional scholarships which may become available from time to time, mainly from funds provided by organizations sponsoring research projects.

Where possible, the scholarships are listed in order of schools within the Faculty of Biological Sciences and the Faculty of Science.

<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 Research Awards</td>
<td></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)</td>
</tr>
<tr>
<td>Australian Government (Research Awards)</td>
<td></td>
<td>As above</td>
<td>Applicants must be honours graduates (or equivalent) who will graduate with honours in current academic year, and who are permanent residents of Australia.</td>
</tr>
<tr>
<td>Australian Government (Course Awards)</td>
<td>Living allowance of $4000 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 are permanent residents of Australia, and who have not previously held a Commonwealth Postgraduate Award. Applications to Registrar by 30 September</td>
</tr>
</tbody>
</table>
### 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>Australian American Educational Foundation Travel Grant*</td>
<td>A total of $500/$3200</td>
<td>Up to 1 year</td>
<td>Applicants must be graduates, senior scholars or post-doctoral Fellows. Gradu­ate applications close 31 December. Other applications by mid-November.</td>
</tr>
<tr>
<td>Australian Federation of University Women</td>
<td></td>
<td></td>
<td>Applicants must be female graduates from any accredited Australian or overseas university.</td>
</tr>
<tr>
<td>The British Council Commonwealth University Interchange Scheme</td>
<td>Cost of travel to UK or other Commonwealth country university</td>
<td></td>
<td>Applicants must be:  1. University staff on study leave. Applications close with Registrar by 30 November. For visits to commence during ensuing financial year 1 April to 31 March.  2. Graduate research workers holding research grants. Applications close with Registrar by 28 February for visits to commence during ensuing 1 April to 31 March.</td>
</tr>
<tr>
<td>Canadian Pacific Airlines Award for Travel to Canada for University Graduates</td>
<td>One free economy class return flight a year to Canada</td>
<td></td>
<td>Graduates of an Australian University who are Australian citizens or permanent residents. Candidates must have been accepted by a Canadian University, be able to support themselves on a full-time basis, and intend to return to Australia. Applications close with Registrar by 31 May.</td>
</tr>
<tr>
<td>Commonwealth Scholarship and Fellowship Plan</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>Graduates who are Commonwealth citizens or British Protected Persons, and who are not older than 35 years of age. Applications close with Registrar by 1 October.</td>
</tr>
<tr>
<td>General Motors Holden's Research Fellowship</td>
<td>Living allowance and other allowances</td>
<td>Maximum of 3 years</td>
<td>Graduates qualified to undertake research program for Masters or PhD degree</td>
</tr>
<tr>
<td>Gowrie Graduate Research Travelling Scholarship</td>
<td>Maximum $2000 pa</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 1939-45 War</td>
</tr>
<tr>
<td>Harkness Fellowships of the Commonwealth Fund of New York†</td>
<td>Living and travel allowances, tuition and research expenses, book and equipment and other allowances</td>
<td>Between 12 to 21 months</td>
<td>Candidates must be either: 1. Members of the Commonwealth or a State Public Service or semi-government Authority. 2. 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 and be between 21-30 years of age. Applications close 23 July.</td>
</tr>
</tbody>
</table>

* Application forms are available from: The Secretary, Department of Education, AAEF Travel Grants, PO Box 826, Woden, ACT 2606.
† Application forms must be obtained from the Australian representative of the Fund, Mr L. T. Hinde, Reserve Bank of Australia, Box 3947, GPO, Sydney, N.S.W. 2001. These must be submitted to the Registrar by 24 July.
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>IBM Graduate Scholarship Plan</td>
<td>A maximum of $1200 pa</td>
<td>A maximum of 2 years for a degree of Master and 4 years for a PhD</td>
<td>Graduates must already hold a scholarship, such as an Australian Government Postgraduate Research Award and be studying computer science or its applications. Applications close with Registrar by 30 November.</td>
</tr>
<tr>
<td>Frank Knox Memorial Fellowships at Harvard University</td>
<td>Stipend of $3400 plus tuition fees pa</td>
<td>2 years</td>
<td>Applicants must be British subjects and Australian citizens, who are graduates or near graduates of an Australian University.</td>
</tr>
<tr>
<td>Nuffield Foundation Commonwealth Travelling Fellowships</td>
<td>Approximately £2240 stg pa for married fellow and wife. Approximately £1760 stg pa in other cases plus travelling costs.</td>
<td>1 year</td>
<td>Australian citizens usually between 25 and 35 who are graduates preferably with higher degrees and who have at least a year’s teaching or research experience at a university. Applications close by February.</td>
</tr>
<tr>
<td>The Rhodes Scholarship**</td>
<td>£1650 stg pa</td>
<td>2 years, may be extended for a third year</td>
<td>Unmarried male and female British subjects, between the ages of 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 July each year.</td>
</tr>
<tr>
<td>Rothmans Fellowships Award†</td>
<td>$12,000 pa</td>
<td>Up to 3 years</td>
<td>The field of study is unrestricted. Applications close early September each year.</td>
</tr>
</tbody>
</table>

**Biological Sciences**

<table>
<thead>
<tr>
<th>Donor</th>
<th>Value</th>
<th>Year/s of Tenure</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queen Elizabeth II Postdoctoral Fellowships in the Physical and Biological Sciences§</td>
<td>Stipend of $13158 pa increased to $14190 pa at age 28 years. $500 pa for dependent wife, $200 pa for each dependent child, plus other allowances.</td>
<td>2 years</td>
<td>Applicants must be Australian citizens or citizens of the UK and colonies ordinarily resident in the UK, who have gained a PhD or equivalent qualification in one of the physical or biological sciences. Usually applicants should be under 30 years of age. Applications close at the end of the first weeks in March and September.</td>
</tr>
</tbody>
</table>

† Applications to the Secretary, The Nuffield Foundation Australian Advisory Committee, Chemistry Laboratory, Barry Building, University of Melbourne, Parkville, Victoria 3052.
** Applications to Mr H. McCredie, Secretary of the NSW Committee, University of Sydney, NSW 2006.
† Applications to The Secretary, Rothmans University Endowment Fund, University of Sydney, NSW 2006.
§ Further details may be obtained from the Commissions in Sydney and Melbourne, or from the School of Health Administration.
* Applications obtainable from the Secretary, Queen Elizabeth Fellowships Committee, Department of Education, PO Box 826, Canberra, ACT 2600 or the Official Secretary, Australia House, Strand, London, W.C.2.
Graduate Scholarships (continued)

<table>
<thead>
<tr>
<th>Donor / Name of Prize</th>
<th>Value</th>
<th>Year/s of Tenure</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Science</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Optical Corporation Contact Lens Research Scholarship</td>
<td>$3000 pa</td>
<td>1 year renewable</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. Applications to Registrar by 30 November.</td>
</tr>
<tr>
<td>Contavue Laboratories Contact Lens Graduate Research Scholarship</td>
<td>$1000 pa</td>
<td>1 year renewable</td>
<td></td>
</tr>
<tr>
<td>Hydron Laboratories Contact Lens Research Scholarship</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science Research Scholarship of the Royal Commission for the Exhibition of 1851</td>
<td>£1200 stg pa</td>
<td>2 years. Renewal for further year possible.</td>
<td>To enable graduates under 26 years of age to undertake research in some branch of pure or applied science at an overseas university. Applicants must be British Commonwealth citizens or citizens of the Republic of Ireland or South Africa, who have done at least 3 years of a university Science Course.</td>
</tr>
<tr>
<td>The Rutherford Scholarship</td>
<td>Travel, fees, etc. A stipend which, if held in the UK, is worth £1050-1500 stg pa</td>
<td>3 years</td>
<td>To enable graduates under 26 years of age, or if holding a PhD under 28 years, 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.</td>
</tr>
<tr>
<td>Shell Scholarship in Science and Engineering</td>
<td>£1750 stg pa plus travelling expenses</td>
<td>2 years</td>
<td>Applicants must be unmarried, male, British subjects, under 25 years of age, with at least 5 years’ domicile in Australia and who are graduates with at least 1 year’s research experience. The successful candidate will undertake 2 years’ graduate research leading to the MSc or PhD degree, at a British university.</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.

<table>
<thead>
<tr>
<th>Donor / Name of Prize</th>
<th>Value $</th>
<th>Awarded for</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sydney Technical College Union Award</td>
<td>50.00</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>
</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 Botany</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. O. Tout Memorial</td>
<td>40.00</td>
<td>Best aggregate any five subjects offered by School of Botany</td>
</tr>
<tr>
<td><strong>School of Chemistry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Analytical Chemistry</td>
<td>100.00</td>
<td>2.013D Advanced Analytical Chemistry</td>
</tr>
<tr>
<td>Abbott Laboratories Pty Ltd</td>
<td>50.00</td>
<td>2.003B Organic Chemistry II</td>
</tr>
<tr>
<td>Australian Chemical Holdings Ltd</td>
<td>21.00</td>
<td>2.121 Chemistry 1A and 2.131 Chemistry 1B</td>
</tr>
<tr>
<td>Australian Consolidated Industries Ltd</td>
<td>30.00</td>
<td></td>
</tr>
<tr>
<td>Borden Chemical Co (Aust) Pty Ltd</td>
<td>50.00</td>
<td>Subject selected by Head of School</td>
</tr>
<tr>
<td>Chamber of Manufactures of New South Wales</td>
<td>15.00</td>
<td></td>
</tr>
<tr>
<td>CSR Chemicals Ltd</td>
<td>100.00</td>
<td>Chemistry Honours</td>
</tr>
<tr>
<td>Inglis Hudson Bequest</td>
<td>6.00</td>
<td>2.002B Organic Chemistry I</td>
</tr>
<tr>
<td>Merck, Sharp &amp; Dohme (Aust) Pty Ltd</td>
<td>52.50</td>
<td>Chemistry — Level 2 subjects in the Science Course</td>
</tr>
<tr>
<td></td>
<td>52.50</td>
<td>Chemistry — Level 3 subjects in the Science Course</td>
</tr>
<tr>
<td>The Nestlé Co (Aust) Ltd</td>
<td>50.00</td>
<td></td>
</tr>
<tr>
<td>Parke Pope</td>
<td>20.00</td>
<td>Subject selected by Head of School</td>
</tr>
<tr>
<td>Tooth &amp; Co Ltd</td>
<td>20.00</td>
<td></td>
</tr>
<tr>
<td>Unilever Aust Pty Ltd</td>
<td>21.00</td>
<td>2.003A Physical Chemistry II</td>
</tr>
<tr>
<td>George Wright</td>
<td>20.00</td>
<td>Subject selected by Head of School</td>
</tr>
<tr>
<td><strong>School of Physics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head of School's Prize in Physics</td>
<td>20.00</td>
<td>Area selected by Head of School</td>
</tr>
<tr>
<td>Physics Staff</td>
<td>60.00</td>
<td>Physics III</td>
</tr>
<tr>
<td>Physics Thesis Prize</td>
<td>40.00</td>
<td>Physics IV</td>
</tr>
<tr>
<td>School Prize for Physics II</td>
<td>40.00</td>
<td>Physics II</td>
</tr>
<tr>
<td><strong>Graduate University Prizes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Thistlethwayte Memorial Prize</td>
<td>100.00</td>
<td>Best essay in the field of water — waste water treatment or water quality management, by MEngSc, MAppSc, ME, MSc student</td>
</tr>
</tbody>
</table>
Board of Studies in Science and Mathematics
Board of Studies in Science and Mathematics

Introduction

The Science and Mathematics Course (397) 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 Mathematics I, which is offered in three versions each of which counts as two units: Mathematics I, Higher Mathematics I and Mathematics IT. One only is required, but care must be taken in making the choice. In general, Mathematics IT considerably limits the choice of units in following years.

Some Schools do not offer a full range of Level III units in the evening. The Schools concerned are marked below with ‡.

Students seeking general advice should contact the Board of Studies in Science and Mathematics Office (Room 57, Main Building, map reference K15) and for advice in specific disciplines should contact the representative of the relevant School as listed below:

| First Year Biology Unit | Dr A. E. Wood |
| School of Anatomy       | Dr R. Molnar (2nd Year) |
|                         | Associate Professor C. R. R. Watson (3rd Year) |
|                         | Professor F. W. D. Rost (4th Year) |
| ‡ School of Applied Geology | Dr. G. J. Baldwin |
| ‡ School of Biochemistry | Professor E. O. P. Thompson |
| ‡ School of Biological Technology | Associate Professor Pamela A. D. Rickard |
| ‡ School of Botany      | Associate Professor M. M. Hindmarsh |
| ‡ School of Chemistry   | Mr W. J. Dunstan |
| ‡ School of Community Medicine | Mr A. E. Stark |
| ‡ School of Electrical Engineering | Mr K. A. Robinson |
| (Computer Science)      | Mr N. Lonergan |
| ‡ School of Geography   | Dr J. Saunders |
| School of Mathematics                      | Associate Professor W. E. Smith       |
| School of Mechanical and Industrial       | Mr J. StA. Sandiford                  |
| Engineering                                |                                            |
| † School of Microbiology                   | Associate Professor R. G. Robertson   |
| School of Philosophy                       | Dr Y. M. Barnet                      |
| School of Physics                          | Professor C. L. Hamblyn               |
| ‡ School of Physiology                      | Mr K. Mann                          |
| ‡ School of Psychology                      | Dr P. H. Barry                      |
| ‡ School of Zoology                         | Dr P. J. Cleary                      |
|                                             | Mr T. J. Clulow                      |
|                                             | Mrs Patricia Dixon                   |
Board of Studies in Science and Mathematics: Staff

Staff

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 a number of specific Schools in other faculties contributing to the Science and Mathematics Course.

The Co-Deans, serving alternately, are Professor S. J. Angyal (Dean of the Faculty of Science) and Professor B. J. F. Ralph† (Dean of the Faculty of Biological Sciences).

The Chairman is Professor R. M. Golding (Chairman of the Faculty of Science).

The Director of Studies in Science is Associate Professor L. G. Parry (School of Physics). The Graduate Assistant is Emma S. Rossi (Faculty of Science).

Saw Kin Loo, Dr M. S. Smith, Dr J. Stone, Dr I. J. Tork; Lecturers: Dr Ewa K. Bystrzycka, B. W. Freeman, P. B. Paisley, Dr R. E. Mohar; Senior Tutors: Dr Jean J. Carter, Dr P. Gemmell; Tutors: Karen A. Ginn, Shirley G. Maclean, D. D. Shimeid, Dr R. T. K. Tan, S. V. Vijayakumar, Catherine Willis; Teaching Fellow: G. S. Kesby.

Department of General Studies

Professor and Head of Department of General Studies: Professor R. F. Hall; Senior Lecturer: Dr J. R. E. Waddell; Lecturer: Helen R. Harding.

School of Geography

Professor of Geography and Head of School: Professor J. A. Mabbutt; Associate Professor: E. A. Fitzpatrick; Senior Lecturer: Dr F. C. Bell; Lecturers: Dr A. D. Abrahams, Dr M. R. Melville, Dr H. J. Schneider; Tutors: G. Atkinson, R. K. Murfet.

School of Applied Geology

Professor of Engineering Geology and Head of School: Professor F. C. Beavis; Senior Lecturers: Dr A. N. Carter, Dr P. C. Rickwood, Dr B. L. Wood.

* See Staff, listed earlier in this handbook.
† For 1976-77.
School of Education

Professor of Education and Head of School: Professor L. M. Brown; Professor of Science Education and Director of Science Teachers' Courses: Professor A. A. Hukins.

School of Electrical Engineering

Department of Computer Science

Professor of Computer Science and Head of School: Professor M. W. Allen; Senior Lecturers: Dr A. Dunworth, Dr J. Lions, Dr G. B. McMahon, Dr P. C. Maxwell; Lecturers: Dr P. W. Baker, L. C. Hill, K. A. Robinson.

School of Community Medicine

Professor of Community Medicine and Head of School: Professor I. W. Webster; Senior Lecturer: A. E. Stark.

School of Chemical Technology

Professor of Chemical Technology and Head of School: Professor F. W. Ayscough; Associate Professor: Dr J. K. Haken.

School of Economics

Professor of Economics and Head of the Department of Industrial Relations: Professor J. R. Niland.

School of History and Philosophy of Science

Professor of History and Philosophy of Science and Head of School: Professor J. Ronayne; Senior Lecturer and Acting Head of School: Dr W. H. Leatherdale; Senior Lecturer: Dr R. M. Gascoigne; Lecturers: Dr W. R. Albury, Dr G. A. Freeland, Dr D. R. Oldroyd, Dr J. R. Saunders.

School of Mechanical and Industrial Engineering

Nuffield Professor of Mechanical Engineering, Head of School and of Department of Fluid Mechanics/Thermodynamics: Professor R. A. A. Bryant; Senior Lecturer: R. E. Corbett.

School of Philosophy

Professor of Philosophy and Head of School: Professor C. L. Hamblin; Lecturer: Dr F. Vlach.

School of Physiology and Pharmacology

Professor of Physiology and Head of School: Professor W. E. Glover; Professor of Clinical Pharmacology: Professor D. W. Wade; Senior Lecturer: Dr M. J. Rowe; Lecturer: Dr J. J. Carmody.

School of Surgery

Chairman and Professor of Traumatic and Orthopaedic Surgery and Head of Department: Professor R. L. Huckstep.

School of Sociology

Professor of Sociology and Head of School: Professor S. Encel.

School of Political Science

Professor of Political Science and Head of School: Professor D. M. McCallum.
Board of Studies in Science and Mathematics

397
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 for 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 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 man's material conditions and in widening his imaginative horizons and his understanding of the universe.

9. To provide opportunities for the development of a student's motivation and social maturity, and an awareness of his own capabilities in relation to a choice of career which will be fruitful to himself 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, Level II, Level II/III, Level III, and Level 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 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 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.
- With the approval of the Dean, 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 57 (Main Building, map reference K15).
- The programs listed below 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 corequisites.
- A prerequisite unit is one which must be completed prior to enrolment in the unit for which it is prescribed. A corequisite unit is one which must either be completed successfully before or be studied concurrently with the unit for which it is prescribed. An excluded unit is one which cannot be counted towards the degree qualification together with the unit which excludes it. In exceptional circumstances, on the recommendation of the head of the appropriate school, the Dean may waive or vary a particular prerequisite or corequisite.
- A single major is a program specifying only 4 Level III units in a discipline.
- A double major is a program specifying more than 6 Level III units in a discipline.

The three year program

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

1. at least 23 units at Level I, II, II/III, III as specified in an individual program with the following requirements:
   - A not less than eight nor more than ten units may be from Level I;
   - B two of the Level I units must be 10.001 Mathematics I, 10.011 Higher Mathematics I or 10.021 Mathematics II;
   - C not less than four units from Level III or as specified in individual programs
2. three General Studies electives, usually one in Year 2 and two in Year 3 or as specified in an individual program.
3. In order to graduate a student must pass all the units specified in the program of his 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, II/III, III as specified in an individual program, with the following requirements:
   - A not less than eight nor more than ten units may be from Level I;
   - B two of the Level I units must be 10.001 Mathematics I, 10.011 Higher Mathematics I or 10.021 Mathematics II;
   - C 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;
3. four General Studies electives, usually one in Year 2, two in Year 3 and one in Year 4 or as specified in an individual program.
4. In order to graduate a student must pass all the units specified in the program of his choice.

Rules governing admission to the Science and Mathematics Course with advanced standing for the purpose of obtaining a double degree

1. Undergraduates* of the University of New South Wales who have satisfied the examiners in at least the first two years of a degree course extending over four or more years and ap-

* In Rule 1, the word 'undergraduate' includes graduands, ie a person may be admitted under these rules if he has met all requirements for a first degree which has not yet been conferred on him, and his admission under these rules shall be no bar to the subsequent award for the first degree.
proved by the Board of Studies in Science and Mathematics for the purpose of double degrees, may be admitted to the Science and Mathematics course (397) with advanced standing. Such undergraduates' performance shall have been of a high standard and their admission shall be subject to the approval of the Dean.

2. Students so admitted who have satisfied the examiners in General Studies subjects and/or Science and Mathematics course units shall be given advanced standing in such General Studies subjects and no more than 14 such Science and Mathematics course units.

3. Students so admitted may be granted exemption from two other Level II Science and Mathematics units on the basis of other subjects completed by them.

4. In order to qualify for the award of the degree of BSc, students so admitted with advanced standing 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 Bachelor's degree under these regulations must include at least four Level III units chosen from related disciplines in accordance with the Science and Mathematics course regulations. One of Mathematics 10.021 or 10.001 or 10.011 must be included in the course (each of these is a double unit).

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

1. Graduates of the University of New South Wales may be admitted to the Science and Mathematics course with exemption in all General Studies subjects completed by them and in no more than twelve Science and Mathematics course units completed by them.

2. Undergraduates of the University of New South Wales who transfer from another course to the Science and Mathematics course (397), may be admitted to the Science and Mathematics course with exemption in all General Studies subjects completed by them and in all Science and Mathematics course units completed by them. Further, where an undergraduate has completed a subject which contains the syllabus material of a Science and Mathematics course unit (or units) the Dean, with the agreement of the Head of School offering the Science and Mathematics course unit (or units) may allow the unit (or units) so covered to be counted to a Bachelor of Science degree.

An undergraduate transferring to the Science and Mathematics course must take Mathematics 10.021 or 10.001 or 10.011 during his first year of enrolment in the course unless one of them has previously been completed.

3. Graduates or undergraduates of other universities or of other approved tertiary institutions may be admitted to the Science and Mathematics course with advanced standing.

4. Students admitted under Rule 3. who have satisfied the examiners in units of the same title or subject matter as Science and Mathematics course subjects in the University may, subject to the approval of the appropriate Heads of School, be granted exemption in no more than eleven Science and Mathematics course units but not including Level III Science and Mathematics course units.

5. Notwithstanding the provisions of Rules 1, 2, 3, and 4., the Board of Studies in Science and Mathematics may determine a special program to be completed by a student who wishes to be granted advanced standing for an honours degree of Bachelor of Science in the University.

**Programs**

Each program has an identifying number. The numbers before the decimal point identify the school according to the following table. The number after the decimal point distinguishes different school programs. Where a double number is given (e.g., 41/70) two identified schools are equally concerned in the program. Programs indicated as 68 are the direct responsibility of the Board of Studies in Science and Mathematics.

| 1 Physics | 42 Biological Technology |
| 2 Chemistry | 43 Botany |
| 6 Computer Science | 44 Microbiology |
| 10 Mathematics | 45 Zoology |
| 12 Psychology | 62 History and Philosophy of Science |
| 25 Geology | 68 Board of Studies in Science and Mathematics |
| 27 Geography | 70 Anatomy |
| 41 Biochemistry | 73 Physiology |

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. Some programs are designed as an integrated four year program leading to the award of the honours degree. A few programs are set out as Years 1, 2 and 3 and lead to the pass degree only.

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, namely,

- **Anatomy**  
  see programs 70.1, 70.2, 41/70, 45/70, 62/70, 68/70, 70/73

- **Biochemistry**  
  see programs 41.1, 2/41, 41/42, 41/43, 41/44, 41/45, 41/70, 41/73

- **Biotechnology**  
  see programs 42.1, 2/42, 41/42, 42/44

- **Botany**  
  see programs 43.1, 43.2, 43.3, 43.4, 43.5, 43.6, 27/43, 41/43, 43/44 or 43/45
<table>
<thead>
<tr>
<th>Science</th>
<th>Programs Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>see programs 2.1, 2.2, 2.3, 2/41, 2/42</td>
</tr>
<tr>
<td>Community Medicine</td>
<td>units available in some programs (the identifying number is 79)</td>
</tr>
<tr>
<td>Computer Science</td>
<td>see program 6.1</td>
</tr>
<tr>
<td>Genetics</td>
<td>*</td>
</tr>
<tr>
<td>Geography</td>
<td>see programs 27.1, 27.2, 27.3, 27/25, 27/43</td>
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<tr>
<td>Geology</td>
<td>see programs 25.1, 25.2, 27/25</td>
</tr>
<tr>
<td>History and Philosophy of Science</td>
<td>see programs 62.1, 62/70</td>
</tr>
<tr>
<td>Marine Science</td>
<td>see programs 68.31, 68.32, 68.33, 68.34</td>
</tr>
<tr>
<td>Mathematics</td>
<td>see programs 10.1, 10.1-11, 10.1-12, 10.1-21, 10.1-22, 10.1-31, 10.1-32, 10.1-41, 10.2-12, 10.2-21, 10.2-22, 10.2-31, 10.2-32, 10.2-41, 10.2-42, 10.3, 10.4, 10.5, 10.6</td>
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<tr>
<td>Microbiology</td>
<td>see programs 44.1, 44.2, 44.3, 44.4, 41/44, 42/44, 43/44</td>
</tr>
<tr>
<td>Occupational Therapy</td>
<td>see program 12/68</td>
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<tr>
<td>Philosophy</td>
<td>units available in some programs (the identifying number is 52)</td>
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<tr>
<td>Physics</td>
<td>see programs 1.1, 1.2, 1.3, 1.5</td>
</tr>
<tr>
<td>Physiology</td>
<td>see programs 73.1, 41/73, 70/73</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>see program 68/70</td>
</tr>
<tr>
<td>Psychology</td>
<td>see programs 12.1, 12/68</td>
</tr>
<tr>
<td>Zoology</td>
<td>see programs 45.1, 45.2, 45.3, 45.4, 45.5, 45.6, 45.7, 45.8, 45.9, 45.10, 45.11, 45.12, 45.13, 41/45, 43/45, 45/70</td>
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### Year 1

#### Physics

<table>
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<th>Program</th>
<th>Units Available</th>
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<td>10.001 or 10.011</td>
<td>Choose 2 of 1 General Studies from Level I units</td>
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### Year 2

#### Physics

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<td>1.022*</td>
</tr>
<tr>
<td>1.032</td>
<td>1.011B, 10.211A</td>
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### Year 3

#### Physics

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<td>1.023*</td>
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<tr>
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### Year 4

#### Physics

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<tr>
<td>1.134</td>
<td>1.144</td>
</tr>
</tbody>
</table>

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* Under consideration at time of publication.

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* Students seeking passes with distinction may be required to take additional material.

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### Year 1

#### Physics, Single major†

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<th>Program</th>
<th>Units Available</th>
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### Year 2

#### Physics, Single major†

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<td>1.022*</td>
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<td>1.032</td>
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### Year 3

#### Physics, Single major†

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<th>Program</th>
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<td>1.023*</td>
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<tr>
<td>1.033*</td>
<td>1.043</td>
</tr>
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* See 1.1 footnote.

† Under exceptional circumstances students taking this program may be eligible for transfer into Year 4 of Program 1.1 or 1.3.
### 1.3 Applied Physics

<table>
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<th>Year 3</th>
<th>Year 4</th>
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</thead>
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<td>1.001 or 1.011</td>
<td>1.012*</td>
<td>1.013*</td>
<td>1.314</td>
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<tr>
<td>10.001 or 10.011</td>
<td>1.022*</td>
<td>1.023*</td>
<td>1.324</td>
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<td>1.032</td>
<td>1.033*</td>
<td>1.334</td>
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<tr>
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<td>10.111B</td>
<td>1.043</td>
<td>1.344</td>
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<tr>
<td>2.121</td>
<td>10.211A</td>
<td>2 General Studies</td>
<td>1 General Studies</td>
</tr>
<tr>
<td>2.131</td>
<td>1 General Studies</td>
<td>electives</td>
<td>elective</td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
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<td>Choose 3 units</td>
<td>3 units from:</td>
<td></td>
</tr>
<tr>
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<td>from:</td>
<td></td>
<td></td>
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<tr>
<td>10.041</td>
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<td></td>
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<td>10.111A</td>
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* See 1.1 footnote.

### 1.5 Theoretical Physics

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<th>Year 4</th>
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<td>1.013* or 10.222F</td>
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<tr>
<td>10.011</td>
<td>1.022*</td>
<td>1.023*</td>
<td>1.124</td>
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<tr>
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<td>1.032</td>
<td>1.033*</td>
<td>1.544</td>
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<td>2.111</td>
<td>10.111A</td>
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<td>2.121</td>
<td>10.111B or 10.121B</td>
<td>2 General Studies</td>
<td>elective</td>
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<tr>
<td>2.131</td>
<td>10.211 A</td>
<td>electives</td>
<td>Choose 2 units</td>
</tr>
<tr>
<td>Choose 2 Level I</td>
<td></td>
<td></td>
<td>from:</td>
</tr>
<tr>
<td>units from:</td>
<td>1 General Studies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.030</td>
<td>elective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.041</td>
<td>Choose 1 unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.011</td>
<td>from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.021</td>
<td>6.601A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.011</td>
<td>10.331</td>
<td>10.122B or 10.112B</td>
<td>1.534</td>
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<tr>
<td></td>
<td>10.411A</td>
<td>10.212A</td>
<td>1.524</td>
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<td>10.422A</td>
<td>1.524</td>
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<td></td>
<td></td>
<td>10.1125 and 10.1126</td>
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* See 1.1 footnote.

### 2.1 Chemistry

#### Single major

<table>
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<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.001 or 1.011</td>
<td>2.002A</td>
<td>2 General Studies</td>
<td>2.004</td>
</tr>
<tr>
<td>2.121</td>
<td>2.002B</td>
<td>electives</td>
<td>1 General Studies</td>
</tr>
<tr>
<td>2.131</td>
<td>2.042C</td>
<td>Choose 8 units</td>
<td>elective</td>
</tr>
<tr>
<td>10.001 or 10.011</td>
<td>-2.002D</td>
<td>from Table 1</td>
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</tr>
<tr>
<td>10.011 or 10.021</td>
<td>1 General Studies</td>
<td>including</td>
<td></td>
</tr>
<tr>
<td>Choose 2 Level I</td>
<td>elective</td>
<td>4 Level III</td>
<td>Chemistry units</td>
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<td>units from Table 1</td>
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* See 1.1 footnote.
### 2.2 Chemistry

<table>
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<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
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<td>1.001 or 1.011</td>
<td>2.002A</td>
<td>2 General Studies electives</td>
<td>2.004</td>
</tr>
<tr>
<td>2.121</td>
<td>2.002B</td>
<td>2 General Studies electives</td>
<td>1 General Studies elective</td>
</tr>
<tr>
<td>2.131</td>
<td>2.002C</td>
<td>Choose 8 Level III units from Table 1</td>
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<tr>
<td>10.001 or</td>
<td>2.002D</td>
<td>including only 4 Chemistry units</td>
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</tr>
<tr>
<td>10.011 or</td>
<td>2.002H</td>
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<td></td>
</tr>
<tr>
<td>10.021</td>
<td>2 General Studies electives</td>
<td>1 General Studies elective</td>
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<tr>
<td>Choose 2 Level I</td>
<td>Choose at least 5 units from</td>
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<tr>
<td>units from Table 1</td>
<td>Table 1 including at least one of:</td>
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<tr>
<td>2.042C and 2.002D</td>
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</table>

### 2.3 Chemistry Double major

Students wishing to take 8 or more Level III Chemistry units are required to transfer to the Pure and Applied Chemistry Course (391) before the commencement of Year 2. If Year 2 studied in the Science and Mathematics course is similar to Year 2 of Course 391, the transfer may still be made before the commencement of Year 3.

The Pure and Applied Chemistry Course is described in detail later in this handbook (Faculty of Science) and enables specialization in Chemistry.

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
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</thead>
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<td>2.121</td>
<td>2.002B</td>
<td>2.003C</td>
<td>1 General Studies elective</td>
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<tr>
<td>2.131</td>
<td>2.042C</td>
<td>2.003D</td>
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<td>10.001 or</td>
<td>2.002D</td>
<td>2.013A</td>
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<td>10.011 or</td>
<td>2.002H</td>
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<td>Choose 4 other Chemistry Level III units</td>
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<td>Choose 2 units from Table 1</td>
<td>electives from Table 1</td>
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<tr>
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### 2/41 Chemistry/Biochemistry

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<th>Year 4</th>
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<td>2.002B</td>
<td>2 General Studies electives</td>
<td>41.103 or 2.004</td>
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<td>2.131</td>
<td>2.042C</td>
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<tr>
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<td>or both</td>
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<td>10.011 or</td>
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### 2/42 Chemistry/Biotechnology

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<td>17.021</td>
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### 6.1 Computer Science

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<td>6.606</td>
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### 10.1 Mathematics

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</thead>
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<td>10.111A or 10.121A</td>
<td>Choose 4 Level III§ mathematics units from Table 1</td>
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<tr>
<td>Choose 6 units from:</td>
<td>10.111B or 10.121B</td>
<td>(or choose 5 if only 3 Level II mathematics units taken)</td>
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<td>10.211A or 10.221A</td>
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<tr>
<td>&amp;/or 2. The BA course*†</td>
<td>1 General Studies elective</td>
<td>Choose 3 (or 2) units from:</td>
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<td>&amp;/or 3. Table 2† for program 10.1</td>
<td>Choose 5 units from:</td>
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</tr>
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<td>1. Table 1</td>
<td>&amp;/or 2. The BA course*†</td>
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<td>&amp;/or 3. Table 2† for program 10.1</td>
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* The program may include up to 8 units from the BA course offered by the following Schools: Drama, Economics, English, French, German, History, Philosophy, Political Science, Russian, Sociology, Spanish and Latin American Studies. Each Upper Level unit so offered by these Schools shall count as 1 1/2-units. Upper Level units from the School of Economics are restricted to all those in Economic History plus 15.062, 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 Head of the School of Mathematics.

§ Not to include more than one Level II/III unit.

### 10.1-11 Pure Mathematics

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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<tr>
<td>10.001 or 10.011</td>
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<td>Choose 4 units from:</td>
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<td>10.112C</td>
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<tr>
<td>&amp;/or 3. Table 2† for program 10.1</td>
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<td>2 General Studies electives</td>
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<td>If only 3 Level II Mathematics units taken in year 2 choose 1 further Level II or Level III Mathematics unit:</td>
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<td>Choose 3 (or 2) units from:</td>
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*† See 10.1 footnotes.
### 10.1-12
**Pure Mathematics Honours**

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<th>Year 3</th>
<th>Year 4</th>
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*† See 10.1 footnotes.

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### 10.1-21
**Applied Mathematics**

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<th>Year 3</th>
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<td>10.212A or 10.222A</td>
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<td>10.212B or 10.222B</td>
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<td>10.111B or 10.121B</td>
<td>10.212M or 10.222M</td>
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<td>10.211D or 10.221D‡</td>
<td>One unit from the Theory of Statistics Level III units or from the Theoretical Mechanics Level III units</td>
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<td>2 General Studies electives</td>
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</table>

Choose 4 units from:

1. Table 1
2. The BA course*†
3. Table 2† for program 10.1

Choose 3 units from:

1. Table 1
2. The BA course*†
3. Table 2† for program 10.1

*† See 10.1 footnotes.

† This unit is strongly recommended but not essential. If not taken, one additional Mathematics unit at Level II or Level III must be taken in either Year 2 or Year 3.
### 10.1-22 Applied Mathematics Honours

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*†† See 10.1 footnotes.

### 10.1-31 Statistics

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<td>10.312C or 10.322C</td>
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<td>10.312D or 10.322D</td>
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*† See 10.1 footnotes.

### 10.1-32 Statistics Honours

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<td>10.121B or 10.111B</td>
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*†† See 10.1 footnotes.
### Year 1

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<th>Course</th>
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| 10.001 or 10.111 | Theoretical Mechanics
| 1.001 or 1.011 | Theoretical Mechanics Honours

Choose 4 units from:

1. Table 1
2. The BA course†
3. Table 2† for program 10.1

### Year 2

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<th>Course</th>
<th>Description</th>
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</table>
| 10.111A or 10.121A | Theoretical Mechanics
| 10.111B or 10.121B | Theoretical Mechanics Honours
| 10.211A or 10.221A | Theoretical Mechanics
| 10.411A or 10.421A | Theoretical Mechanics Honours
| 10.411B or 10.421B | Theoretical Mechanics

1 General Studies elective

Choose 3 units from:

1. Table 1
2. The BA course†
3. Table 2† for program 10.1

### Year 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
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</table>
| 10.412A or 10.422A | Theoretical Mechanics
| 10.412B or 10.422B | Theoretical Mechanics Honours
| 10.412D or 10.422D | Theoretical Mechanics

Choose 1 unit from:

1.125 and 10.126 or 10.126

2 General Studies electives

Choose 3 units from:

1. Table 1
2. The BA course†
3. Table 2† for program 10.1

### Year 4

<table>
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<th>Course</th>
<th>Description</th>
</tr>
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</table>
| 10.423 | Theoretical Mechanics

1 General Studies elective

Choose 2 units from:

1. 10.412A
2. 10.412B or 10.212A
3. 10.422M or 10.222M
4. 10.422D or 10.212D
5. 0.422E or (10.1125 and 10.1126)

Choose 1 unit from:

1. Table 1
2. The BA course†
3. Table 2† for program 10.1

†† See 10.1 footnotes.
### 10.1-5
#### Applied Mathematics and Theoretical Mechanics

**Year 1**
- 10.001 or 10.011
- Choose 4 units from:
  1. Table 1
  &/or 2. The BA course*†
  &/or 3. Table 2† for program 10.1

**Year 2**
- 10.11A or 10.121A
- 10.11B or 10.121B
- Choose 4 units from:
  1. Table 1
  &/or 2. The BA course*†
  &/or 3. Table 2† for program 10.1

**Year 3**
- 10.412A or 10.422A
- 10.412B or 10.422B
- Choose 2 units from:
  1. Table 1
  &/or 2. The BA course*†
  &/or 3. Table 2† for program 10.1

*† See 10.1 footnotes.

### 10.2
#### Mathematics and Liberal Studies

**Year 1**
- 10.001 or 10.011
- Choose 6 units* from:
  1. Table 1†
  &/or 2. The BA course§
  &/or 3. Table 2 for program 10.2

**Year 2**
- 10.11A or 10.121A
- 10.11B or 10.121B
- Choose 5 units from:
  1. Table 1†
  &/or 2. The BA course§
  &/or 3. Table 2 for program 10.2

**Year 3**
- Choose 4 Level III†
- Mathematics units from Table 1 (or)
- Choose 5 if only 3
- Level II Mathematics units taken
- Choose 5 (or 4)
- units from:
  1. Table 1†
  &/or 2. The BA course§
  &/or 3. Table 2 for program 10.2

*† See 10.2 footnotes.

---

**Note:** The program shall consist of at least 25 units; there is no General Studies requirement.

* Except for mathematics units, not more than 2 Level I units may be taken in one subject.
† Units in Geography, History and Philosophy of Science, and Philosophy shall be those from the BA course.
§ The program shall include at least 6 units from the BA course offered by the following Schools: Drama, Economics, English, French, Geography, German, History, History and Philosophy of Science, Philosophy, Political Science, Russian, Sociology, Spanish and Latin American Studies. Each Upper Level unit so offered by these schools shall count as 1½ units. Upper Level units from the School of Economics are restricted to all those in Economic History plus 15.062, 15.072, 15.263 and 15.273.
‡ Not to include more than one Level II/III unit.
### 10.2-11

**Pure Mathematics and Liberal Studies**

**Year 1**
- Choose 6 units* from:
  - 1. Table 1†
  - /&/or 2. The BA course§
  - /&/or 3. Table 2 for program 10.2

**Year 2**
- Choose 5 units from:
  - 1. Table 1†
  - /&/or 2. The BA course§
  - /&/or 3. Table 2 for program 10.2

**Year 3**
- Choose 4 units from:
  - 10.1111, 10.1112, 10.1121, 10.1122, 10.1123, 10.1124, 10.1125, 10.1126, 10.1127, 10.1128, 10.1129, 10.112A, 10.121A, 10.121B, 10.122A, 10.122B, 10.122C

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**Note:** The program shall consist of at least 25 units; there is no General Studies requirement.

*†§ See 10.2 footnotes.

---

### 10.2-12

**Pure Mathematics Honours and Liberal Studies**

**Year 1**
- Choose 6 units* from:
  - 1. Table 1†
  - /&/or 2. The BA course§
  - /&/or 3. Table 2 for program 10.2

**Year 2**
- Choose 4 units from:
  - 1. Table 1†
  - /&/or 2. The BA course§
  - /&/or 3. Table 2 for program 10.2

**Year 3**
- Choose 5 units from:
  - 1. Table 1†
  - /&/or 2. The BA course§
  - /&/or 3. Table 2 for program 10.2

**Year 4**
- 10.122A
- 10.122B
- 10.122C
- 10.122D
- 10.123

---

**Note:** The first three years of the program shall consist of at least 25 units; there is no General Studies requirement.

*†§ See 10.2 footnotes.
### 10.2-21

**Applied Mathematics and Liberal Studies**

<table>
<thead>
<tr>
<th>Year 1</th>
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<th>Year 3</th>
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<td>10.212A or 10.222A</td>
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<td>Choose 6 units* from:</td>
<td>10.111B or 10.121B</td>
<td>10.212L or 10.222L</td>
</tr>
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<td>&amp;/or 2. The BA course§</td>
<td>10.211A or 10.221A</td>
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<tr>
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<td>1. Table 1†</td>
</tr>
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<td>&amp;/or 2. The BA course§</td>
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</tbody>
</table>

**Note:** The program shall consist of at least 25 units; there is no General Studies requirement.

*†‡ See 10.2 footnotes.

† This unit is strongly recommended but not essential. If not taken one additional Mathematics unit at Level II or Level III must be taken in either year 2 or year 3.

### 10.2-22

**Applied Mathematics Honours and Liberal Studies**

<table>
<thead>
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<th>Year 4</th>
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<td>10.221D</td>
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</table>

**Note:** The first three years of the program shall consist of at least 25 units; there is no General Studies requirement.

*†‡‡ See 10.2 footnotes.
10.2-31
Statistics and Liberal Studies

Year 1
Choose 6 units* from:
1. Table 1† &/or 2. The BA course§ &/or 3. Table 2 for program 10.2

Year 2
Choose 2 units from:
1. Table 1† &/or 2. The BA course§ &/or 3. Table 2 for program 10.2

Year 3
Choose 4 units from:
10.312A or 10.322A 10.312B or 10.322B 10.312C or 10.322C 10.312D or 10.322D 10.312E or 10.322E
Choose 3 Level III Mathematics or Computer Science units from Table 1
Choose 2 units from:
1. Table 1† &/or 2. The BA course§ &/or 3. Table 2 for program 10.2

Note: The program shall consist of at least 25 units; there is no General Studies requirement.
†§ See 10.2 footnotes.

10.2-32
Statistics Honours and Liberal Studies

Year 1
Choose 6 units* from:
1. Table 1† &/or 2. The BA course§ &/or 3. Table 2 for program 10.2

Year 2
Choose 2 units from:
1. Table 1† &/or 2. The BA course§ &/or 3. Table 2 for program 10.2

Year 3
Choose 4 units from
Choose 3 Level III Mathematics or Computer Science units from Table 1
Choose 2 units from:
1. Table 1† &/or 2. The BA course§ &/or 3. Table 2 for program 10.2

Year 4
10.323

Note: The first three years of the program shall consist of at least 25 units; there is no General Studies requirement.
†§ See 10.2 footnotes.
### 10.2-41 Theoretical Mechanics and Liberal Studies

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**Note:** The three year program shall consist of at least 25 units; there is no General Studies requirement.

*†† See 10.2 footnotes.

### 10.2-42 Theoretical Mechanics Honours and Liberal Studies

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<th>Year 1</th>
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<th>Year 3</th>
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**Note:** The first three years of the program shall consist of at least 25 units; there is no General Studies requirement.

*†† See 10.2 footnotes.
Sciences

**10.3 Applied Mathematics (Economic Optimization)**

**Year 1**
- 10.001 or 10.011
- Choose 4 units from:
  - 1. Table 1
  - /or 2. The BA course
  - /or 3. Table 2 for program 10.3

**Year 2**
- 10.111A or 10.121A
- 10.111B or 10.121B
- 10.211A or 10.221A
- 10.211D or 10.221D
- 10.002
- 15.002
- 15.042
- 1 General Studies elective

Choose either 10.331 and 1 unit from:
- 1. Table 1
- /or 2. The BA course
- /or 3. Table 2 for program 10.3

or
Choose both:
- 10.311A
- 10.311B

**Year 3**
- 10.212L or 10.222L
- 10.212M or 10.222M
- 15.003
- 15.413
- 15.423
- 1 General Studies elective
- Choose 2 Level III* Mathematics units

Note: Only 2 General Studies electives are required in this program. Each of 14.601, 15.601 and 15.611 (Table 2) may be substituted for a General Studies elective but may not then count as a qualifying unit.

* The two half units 10.1125 and 10.1126 are recommended.

---

**10.4 Applied Mathematics Honours (Economic Optimization)**

**Year 1**
- 10.011
- 15.001
- 15.011

Choose 4 units from:
- 1. Table 1
- /or 2. The BA course
- /or 3. Table 2 for program 10.4

**Year 2**
- 10.121A or 10.111A
- 10.121B
- 10.221A
- 10.221D or 10.331
- 10.311A or 10.311B

or
- 1 General Studies elective

**Year 3**
- 10.222A
- 10.222L
- 10.222M
- 15.034
- 15.013
- 15.033
- 15.413
- 15.423

**Year 4**
- 10.233
- 15.024
- 15.034
- 15.423

Notes: 1. Only 2 General Studies electives are required in this program. Each of 14.601, 15.601 and 15.611 (Table 2) may be substituted for a General Studies elective but may not then count as a qualifying unit.

2. Where higher units are specified in years 1 and 2, exceptional grades in suitable ordinary units may, at the discretion of the Head of School of Mathematics, be accepted as equivalent in the case of students seeking transfer into the program.
### 10.5 Mathematics of Management

#### Year 1
- 10.001 or 10.011
- 14.501
- 14.511
- 15.001
- 15.011

Choose 2 units from:
1. Table 1
2. Table 2 for program 10.5

#### Year 2
- 10.111A or 10.121A
- 10.111B or 10.121B
- 10.211A or 10.221A
- 10.211D or 10.221D
- 10.311A or 10.321A
- 14.522
- 14.602

1 General Studies elective

Choose at least one of:
- 14.542
- 14.603
- 14.613
- 15.042

#### Year 3
1 General Studies elective
- 14.583

Choose at least 4 Level III mathematics units from Table 1, of which at least 2 shall be selected from:
- 10.212A or 10.222A
- 10.412D or 10.422D
- 10.212L or 10.222L
- 10.212M or 10.222M
- 10.311B or 10.321B
- 10.312A or 10.322A

Choose at least one unit from:
- 14.604
- 14.608
- 14.614
- 14.615

Choose any remaining units from:
1. Table 1
2. Table 2 for program 10.5

Note: Only 2 General Studies electives are required in this program. Each of 14.601, 15.601 and 15.611 (Table 2) may be substituted for a General Studies elective but may not then count as a qualifying unit.

### 10.6 Mathematics of Management Honours Program

#### Year 1
- 10.011
- 14.501
- 14.511
- 15.001
- 15.011

Choose 2 units from:
1. Table 1
2. Table 2 for program 10.6

#### Year 2
- 10.121A or 10.111A
- 10.121B
- 10.221A
- 10.221D
- 10.331*
- 14.532
- 14.552

1 General Studies elective

Choose either
- 15.062 and 15.072
- 15.042 and 15.002

#### Year 3
1 General Studies elective
- 14.593

Choose 1 Level III unit from:
1. Table 1

#### Year 4
- 10.222A
- 10.222L
- 10.222M
- 10.122B
- 14.573
- 14.593

#### Notes:
1. Only 2 General Studies electives are required in this program. Each of 14.601, 15.601 and 15.611 (Table 2) may be substituted for a General Studies elective but may not then count as a qualifying unit.
2. Where higher units are specified in Years 1 and 2, exceptional grades in suitable ordinary units may, at the discretion of the Head of the School of Mathematics, be accepted as equivalent in the case of students seeking transfer into the program.
* May be taken in third year.
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<th>Year 3</th>
<th>Year 4</th>
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<td>and 12.014 or 12.044 in Year 4 and</td>
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<td>1.001 or 1.011</td>
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<td>Choose 4 units from Table 1</td>
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25/27 Science Geography/Geology

See 27/25
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<th>Year 4</th>
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| **27.1**  
Science  
Geography  
with Botany | | | |
| 10.001 or 10.011 or 10.021 27.801 27.802 | 27.811 27.812 27.813 | 2 General Studies electives  
Choose 8 units including at least 4 Level III units from Table 1 including at least 3 units from: 27.103 27.203 27.413 27.423 or 27.863 27.872 | 27.604 1 General Studies elective |
| Choose 4 Level I units from Table 1 | Choose 4 units from Table 1 including not more than 2 Level I units. | | |
| **27.2**  
Science  
Geography  
with Botany | | | |
| 10.001 or 10.011 or 10.021 17.011 17.021 27.801 27.802 | 1.001 27.811 27.812 27.813 43.101 43.111 | 2 General Studies electives  
Choose 4 units from: 27.023 27.413 27.423 27.840 27.862 43.112 43.162 | 27.604 1 General Studies elective |
| Choose 2 units from: 2.111 2.121 2.131 | | | |
| **27.3**  
Science  
Geography  
with Geology | | | |
| 2.121 2.131 10.001 or 10.011 or 10.021 25.011 27.801 27.802 | 1.001 25.012 25.022 27.811 27.812 27.813 | 2 General Studies electives  
Choose 3 units from: 25.1333 27.023 27.103 27.203 27.840 27.862 | 27.604 1 General Studies elective |
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## 41/2
Biochemistry/Chemistry

See 2/41

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## 41/42
Biochemistry/Biotechnology

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## 41/43
Biochemistry/Botany

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## 41/44
Biochemistry

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## Notes
- Choose 2 Level I units from Table 1.
- Choose at least 1 unit from Table 1.
- Choose either 41.102B or both 41.102C and 41.102D.
- Choose 10 units including either: 44.563 or 44.573 or 44.583.
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Choose 1 unit from:
- 2.002A
- 2.002D
- 2.042C
- 17.012
- 43.101

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1 General Studies elective

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Choose 2 units from Table 1

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Choose 1 unit from:
- 2.002A
- 2.002D
- 2.042C
- 17.012
- 70.011B

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Choose 2 Level I units from Table 1

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Choose 1 unit from:
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- 2.002D
- 2.042C

### Year 3

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### Year 4

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### Year 1
- **42.1 Biotechnology (General)**
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  - 2.131
  - 10.001 or 10.011 or 10.021
  - 17.011
  - 17.021
- **42/2 Biotechnology/Chemistry**
- **42/41 Biotechnology/Biochemistry**
- **42/44 Biotechnology/Microbiology**
  - 1.001 or 1.011
  - 2.121
  - 2.131
  - 10.001 or 10.011 or 10.021
  - 17.011
  - 17.021

### Year 2
- 2.002A
- 2.002B
- 41.101
- 41.111
- 42.101
- 44.101
- 1 General Studies elective
- Choose 2 Level units from Table 1

### Year 3
- 42.102A
- 42.102B
- 41.101
- 41.111
- 42.101
- 44.101
- 2 General Studies electives
- Choose 6 Level III units from Table 1

### Year 4
- 42.103
- 1 General Studies elective
- 42.103 or Choose 10 units including either:
  - 44.563
  - 44.573
  - 44.583 and
  - 44.513
  - 44.523
  - 44.533
  - 44.543
  - 44.553
### 43.1 Systematic Botany

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### 43.2 Mycology — Plant Pathology

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### 43.3 Botany — Cellular Plant Physiology

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73
### 43/27
Science Geography/Botany

See 27/43

### 43/41
Botany/Biochemistry

See 41/43

### 43/44
Botany/Microbiology

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<td>and from:</td>
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### 43/45
Plant Pathology/Entomology

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### 44.1 Microbiology

**Year 1**
- 2.121
- 2.131
- 10.001 or 10.011 or 10.021
- 17.011 or 17.021

Choose 2 Level I units from Table 1

**Year 2**
- 2.002B
- 17.012
- 41.101
- 44.101

1 General Studies elective

**Year 3**
- 41.102A
- 44.102
- 44.112
- 44.132

2 General Studies electives

**Year 4**
- 1 General Studies elective
- Choose 10 units including either:
  - 44.563 or 44.573 or 44.583
- and from:
  - 44.513
  - 44.523
  - 44.533
  - 44.543
  - 44.553

### 44.2 Microbiology (Immunology)

**Year 1**
- 2.121
- 2.131
- 10.001 or 10.011 or 10.021
- 17.011 or 17.021

Choose 2 Level I units from Table 1

**Year 2**
- 2.002B
- 41.101
- 44.101
- 70.011A

1 General Studies elective

**Year 3**
- 41.102A
- 44.102
- 44.112
- 44.122

2 General Studies electives

**Year 4**
- 1 General Studies elective
- Choose 10 units including either:
  - 44.563 or 44.573 or 44.583
- and from:
  - 44.513
  - 44.523
  - 44.533
  - 44.543
  - 44.553

### 44.3 Microbiology (Ecology)

**Year 1**
- 2.121
- 2.131
- 10.001 or 10.011 or 10.021
- 17.011 or 17.021

Choose 2 Level I units from Table 1

**Year 2**
- 17.012
- 41.101
- 43.111
- 43.131
- 44.101
- 45.201

1 General Studies elective

**Year 3**
- 43.132
- 43.142
- 43.172
- 44.102
- 44.112
- 45.112

2 General Studies electives

**Year 4**
- 1 General Studies elective
- Choose 10 units including either:
  - 44.563 or 44.573 or 44.583
- and from:
  - 44.513
  - 44.523
  - 44.533
  - 44.543
  - 44.553

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44/41 Microbiology/Biochemistry

See 41/44

44/42 Microbiology/Biotechnology

See 42/44

44/43 Microbiology/Botany

See 43/44
### Year 1

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<th>45.3 Zoology with Botany</th>
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### Year 2

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### Year 3

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### General Studies Electives

- **Zoology, Botany, Microbiology, Mathematics or 79.201**

### Level III Zoology Units

- Choose at least 4 units from:
  - 45.101
  - 43.111
  - 43.121
  - 45.101
  - 45.201
  - 45.301
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<td>17.021</td>
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### Year 1

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### Year 2

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<td>Choose either 45.201 or 45.402</td>
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### Year 3

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### Sciences

#### Year 1

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</table>

Choose 2 Level I units from Table 1

#### Year 2

| 41.101                                  |
| 43.111                                  |
| 43.121                                  |
| 45.101                                  |
| 45.102 (1 General Studies elective)     |
| 43.422                                  |

Choose 3 units from Botany, Zoology or Biochemistry

#### Year 3

| 43.122                                  |
| 43.182                                  |
| 45.402                                  |
| 45.412                                  |
| 45.422                                  |

Choose either:

- 43.112 or
- 43.162

Choose 1 unit from Botany or Zoology

#### Year 4

| 45.103 (1 General Studies elective)   |

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### Year 1

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<tr>
<td>1.001 or</td>
</tr>
<tr>
<td>1.011</td>
</tr>
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<td>2.131</td>
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<tr>
<td>10.001 or</td>
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<td>10.011 or</td>
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<tr>
<td>10.021</td>
</tr>
<tr>
<td>17.011</td>
</tr>
<tr>
<td>17.021</td>
</tr>
</tbody>
</table>

Choose 2 Level I units from Table 1

#### Year 2

| 41.101                                  |
| 43.111                                  |
| 43.102                                  |
| 45.121                                  |
| 45.412                                  |

Choose either:

- 43.112 or
- 43.162

Choose 1 unit from Botany or Zoology

#### Year 3

| 79.201                                  |
| 79.302                                  |

Choose 2 units from:

- 43.102
- 43.112
- 43.162

#### Year 4

| 45.103 (1 General Studies elective)   |

---

### Year 1

<table>
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<tr>
<th>45.12 Entomology and Ecology</th>
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<td>2.131</td>
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<td>10.001 or</td>
</tr>
<tr>
<td>10.011 or</td>
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<tr>
<td>10.021</td>
</tr>
<tr>
<td>17.011</td>
</tr>
<tr>
<td>17.021</td>
</tr>
</tbody>
</table>

Choose 2 Level I units from Table 1

#### Year 2

| 43.101                                  |
| 43.102                                  |
| 45.201                                  |
| 45.402                                  |

Choose 3 Level II Units from Table 1

#### Year 3

| 17.012                                  |
| 45.422                                  |

Choose 2 units from:

- 43.102
- 43.112
- 43.162

#### Year 4

| 45.103 (1 General Studies elective)   |

---
### 45.13 Entomology and Plant Pathology

<table>
<thead>
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<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
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<td>45.103</td>
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<td>2.131</td>
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<tr>
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<td>45.422</td>
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<td>10.021</td>
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<td>44.101</td>
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<td>45.402</td>
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<td>Choose 2 Level I units from Table 1</td>
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<tr>
<td>Choose 2 units from:</td>
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<td></td>
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<tr>
<td>45.201</td>
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<tr>
<td>45.301</td>
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</table>

- **General Studies**: 17.011
- **Pathology**: 1 General Studies elective
- **Zoology or Botany**: Choose 2 units from: units

### 45/41 Zoology/Biochemistry

See 41/45

### 45/43 Plant Pathology — Entomology

See 43/45

### 45/70 Zoology/Anatomy

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
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<tr>
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<td>70.012A</td>
<td>1 General Studies elective</td>
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<td>2.131</td>
<td>45.301</td>
<td>2 General Studies electives</td>
<td></td>
</tr>
<tr>
<td>10.001 or 10.011</td>
<td>70.011A</td>
<td></td>
<td>45.103 or 70.013</td>
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<td>10.021</td>
<td>70.011C</td>
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<td>17.011</td>
<td>1 General Studies elective</td>
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<td>17.021</td>
<td>Choose 3 units from Table 1 including</td>
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<td>2 units from Biochemistry, Chemistry, Geology, Mathematics or Physics</td>
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<td>70.304</td>
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<td>Choose 4 Level III units</td>
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<td>70.303</td>
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<td>70.012B</td>
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<td>70.012C</td>
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<tr>
<td>70.013C</td>
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</table>

- **General Studies**: 17.021
- **Pathology**: Choose 2 units from: units
- **Zoology units from Table 1**: 70.304
- **Chemistry units from Table 1**: 70.303
- **Geology units from Table 1**: 70.304
## 62.1 History and Philosophy of Science

<table>
<thead>
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<th>Year 3</th>
<th>Year 4</th>
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</thead>
<tbody>
<tr>
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<td>2 General Studies electives</td>
<td>62.014</td>
</tr>
<tr>
<td>Choose at least 6 Level I units from Table 1</td>
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<td>Choose 8 units from Table 1 including 4 units from:</td>
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<td>62.032</td>
<td>62.013</td>
<td>62.014 or 70.013</td>
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<td>62.014 or 70.013</td>
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<td>62.014 or 70.013</td>
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<td>62.063</td>
<td>62.014 or 70.013</td>
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<td>62.073</td>
<td>62.014 or 70.013</td>
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<td>62.014 or 70.013</td>
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<td></td>
<td>62.093</td>
<td>62.014 or 70.013</td>
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## 62/70 History and Philosophy of Science/Anatomy

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<th>Year 3</th>
<th>Year 4</th>
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<td>2.121</td>
<td>62.012</td>
<td>70.012A</td>
<td>1 General Studies elective</td>
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<td>2.131</td>
<td>62.022</td>
<td>1 General Studies elective</td>
<td>62.014</td>
</tr>
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<td>Choose 4 units from:</td>
<td>1 General Studies elective</td>
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<tr>
<td>17.011</td>
<td>70.011A</td>
<td>62.013</td>
<td>62.014 or 70.013</td>
</tr>
<tr>
<td>17.021</td>
<td>70.011B</td>
<td>62.023</td>
<td>62.014 or 70.013</td>
</tr>
<tr>
<td>Choose 2 Level I units from Table 1</td>
<td>70.011C</td>
<td>62.033</td>
<td>62.014 or 70.013</td>
</tr>
<tr>
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<td>62.014 or 70.013</td>
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<td>70.011B</td>
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<td>70.012C</td>
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## 68.31 Marine Science (Physical Oceanography)

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<td>1.913</td>
</tr>
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<td>10.001 or 10.011</td>
<td>1.012 or 10.411A</td>
<td>10.411A</td>
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<td>Choose 4 units from two of the groups 1., 2. and 3.</td>
<td>1 General Studies elective</td>
<td>10.412A</td>
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<td>1. 17.011</td>
<td>43.111</td>
<td>2 General Studies electives</td>
</tr>
<tr>
<td>17.021</td>
<td>45.201</td>
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</tr>
<tr>
<td>2. 25.011</td>
<td>17.012</td>
<td>Choose 5 units from Table 1 which may include units from 2 of the groups 1., 2. and 3. chosen in Year 1:</td>
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<tr>
<td>27.801</td>
<td>43.111</td>
<td>1. At least 1 unit from</td>
</tr>
<tr>
<td>27.802</td>
<td>45.201</td>
<td>1. 43.172</td>
</tr>
<tr>
<td>2. 25.633A and 27.413A</td>
<td>3. 2.043A</td>
<td></td>
</tr>
<tr>
<td>3. 2.121</td>
<td>2.002A</td>
<td>2. none</td>
</tr>
<tr>
<td>2.131</td>
<td>2.002D</td>
<td>3. 2.043A</td>
</tr>
</tbody>
</table>

82
<table>
<thead>
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<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.001 or 10.011 17.011 17.021</td>
<td>68.302 43.111 44.101 45.201</td>
<td>43.172 45.112</td>
<td>68.004 1 General Studies elective</td>
</tr>
</tbody>
</table>
| Choose 4 units from 2 of the groups 1., 2. and 3.  
1. 1.001 or 1.011  
2. 25.011 or 27.801 and 27.802  
3. 2.121 2.131 | Choose at least 1 General Studies elective  
Choose at least 1 unit from:  
10.331 17.012 41.101 | Choose at least 6 units from Table 1 which may include units from 2 of the groups 1., 2. and 3. chosen in Year 1:  
1. 10.031  
2. 25.633A and 27.413A  
3. 2.002A 2.002D | 1 General Studies elective |

---

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.001 or 10.011 25.011</td>
<td>68.302 25.022 27.801 27.802</td>
<td>25.613 25.623 25.633A and 27.413A</td>
<td>68.004 1 General Studies elective</td>
</tr>
</tbody>
</table>
| Choose 4 units from 2 of the groups 1., 2. and 3.  
1. 1.001 or 1.011  
2. 17.011 17.021  
3. 2.121 2.131 | Choose at least 3 units from Table 1 including the units required from 2 of the groups 1., 2. and 3. chosen in Year 1:  
1. 10.031  
2. at least 1 unit from:  
17.012 43.111 45.201 2.002A 2.002D | Choose 4 units from Table 1 which may include units from 2 of the groups 1., 2. and 3. chosen in Year 1:  
1. 10.032  
2. none 3. 2.043A | 2 General Studies electives |
<table>
<thead>
<tr>
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<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
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<td>68.302</td>
<td>2.043</td>
<td>68.004</td>
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<td>2.131</td>
<td>2.002A</td>
<td>2.003D</td>
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<td>(Environmental Chemistry)</td>
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<td>2 General Studies</td>
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<td>Choose 4 Units from 2 of the groups 1., 2. and 3.</td>
<td>elective</td>
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<tr>
<td>1.</td>
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<td>Choose at least 4 units from Table 1 including the units required from 2 of the chosen in Year 1:</td>
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<td>1.001</td>
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<td>1.0.031</td>
<td>1. 10.032</td>
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<td>2.</td>
<td>17.011</td>
<td>2. At least 1 unit from:</td>
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<td>3.</td>
<td>25.601</td>
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</table>

**68/12 Occupational Therapy Graduate Diploma/Psychology**

See 12/68

<table>
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<tr>
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<th>Year 1</th>
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<th>Year 3</th>
<th>Year 4</th>
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<td>2 General Studies</td>
<td>70.013 or 70.013 in Year 4</td>
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<td>2.131</td>
<td>70.011B</td>
<td>and Graduate</td>
<td>and Graduate Diploma at</td>
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<td>Diploma/</td>
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<td>70.011C</td>
<td>from Table 1</td>
<td>Cumberland College of</td>
</tr>
<tr>
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<td>73.011A</td>
<td>including at</td>
<td>Health Sciences in Year</td>
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<td>5.</td>
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<td>from:</td>
<td>from:</td>
<td>or</td>
</tr>
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<td>70.012B</td>
<td>Graduate Diploma at</td>
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<td>Table 1</td>
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<td>Health Sciences in Year</td>
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<td>1 General Studies</td>
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<td>10.011 or 10.021</td>
<td>1 General Studies</td>
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<td>elective</td>
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<td>17.021</td>
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<td>70.304</td>
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</table>
### Year 1
*10.001 or 10.011 or 10.021 or 17.011 or 17.021*  
Choose 4 Level I units from Table 1

### Year 2
*70.011A or 70.011C*

**1 General Studies elective**

Choose at least 5 units from Table 1

### Year 3
*70.012A*

**2 General Studies electives**

Choose 7 units from Table 1 including at least 3 units from:  
*70.011B, 70.012B, 70.012C, 70.303, 70.304*

### Year 4
*70.013*

**1 General Studies elective**

---

### 70/41 Anatomy/Biochemistry

See 41/70

### 70/45 Anatomy/Zoology

See 45/70

### 70/62 Anatomy/History and Philosophy of Science

See 62/70

### 70/68 Anatomy/Physiotherapy Graduate Diploma

See 68/70
### Year 1
- 70/73 Anatomy/Physiology
  - 2.121
  - 2.131
  - 10.001 or 10.011 or 10.021
  - 17.011
  - 17.021
  - Choose 2 Level I units from Table 1

### Year 2
- 70/73 Anatomy/Physiology
  - 41.101
  - 41.111
  - 70.011A or 70.011C
  - 73.011A
  - 1 General Studies elective
  - Choose 2 Level I units from Table 1

### Year 3
- 70/73 Anatomy/Physiology
  - 70.012A
  - 70.012B
  - 70.012C
  - 70.011B
  - 70.011C
  - 70.303
  - 70.304

### Year 4
- 70/73 Anatomy/Physiology
  - 1 General Studies elective
  - 73.013 or 73.012

### Year 1
- 73/41 Physiology/Biochemistry
  - 2.121
  - 2.131
  - 10.001 or 10.011 or 10.021
  - 17.011
  - 17.021
  - Choose 2 Level I units from Table 1

### Year 2
- 73/41 Physiology/Biochemistry
  - 41.101
  - 41.111
  - 70.011A
  - 73.011A
  - 1 General Studies elective
  - Choose 1 unit from Table 1

### Year 3
- 73/41 Physiology/Biochemistry
  - 73.012
  - 2 General Studies electives
  - Choose 4 units from Table 1

### Year 4
- 73/41 Physiology/Biochemistry
  - 73.013
  - 1 General Studies elective

### 73/41 Physiology/Biochemistry
See 41/73

### Year 1
- 73/70 Physiology/Anatomy
  - 2.121
  - 2.131
  - 10.001 or 10.011 or 10.021
  - 17.011
  - 17.021
  - Choose 2 Level I units from Table 1

### Year 2
- 73/70 Physiology/Anatomy
  - 41.101
  - 41.111
  - 70.011A
  - 73.011A
  - 1 General Studies elective
  - Choose 3 units from Table 1

### Year 3
- 73/70 Physiology/Anatomy
  - 70.012A
  - 70.012B
  - 70.012C
  - 70.303
  - 70.304

### Year 4
- 73/70 Physiology/Anatomy
  - 1 General Studies elective
  - 73.013

### 73/70 Physiology/Anatomy
See 70/73
### Table 1: Board of Studies in Science and Mathematics (Units offered)

#### Tabular 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).

#### School of Physics

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<th>No.</th>
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<th>Co-requisites</th>
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*For footnotes, see overleaf*
### Sciences

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### Physics Level III Supplementary Units

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*The School of Physics has introduced new and revised Level II and Level III units. The School realises that some students presently enrolled will not have completed either all of the old Level II units, or all of the old Level III units. Some of the new units are sufficiently compatible to permit substitution of a new unit in a program requiring an old unit. Where this is not possible the old unit, indicated by an asterisk in the table above, will be provided to those students wishing to complete a set of Level II or Level III units.

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## School of Chemistry

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For footnotes, see overleaf
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<tr>
<td>2.043L</td>
<td>Chemistry and Enzymology of Foods†</td>
<td>III</td>
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<td>2.053A</td>
<td>Chemical Kinetics and Reaction Mechanisms</td>
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Table 1: Board of Studies in Science and Mathematics (Units offered)

School of Chemistry (continued)

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<th>Level</th>
<th>Unit Value</th>
<th>When Offered</th>
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<td>2.053L</td>
<td>Biological and Agricultural Chemistry†</td>
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<td>2.063A</td>
<td>Advanced Molecular Spectroscopy</td>
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</table>

* These courses may be offered either Full year, one session, or both.
† Only one of these double units may be chosen.
‡ A student who has passed 2.121 may not subsequently enrol in 2.111.

School of Mechanical and Industrial Engineering

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<th>Unit Value</th>
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<td>5.010</td>
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<td>I</td>
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<td>6</td>
<td>2 unit Science (incl. Physics) (at HSC Exam Grade 1, 2 or 3) or 4 unit Science (incl. Physics) (at HSC Exam Grade 1, 2, 3 or 4) or 2 unit Industrial Arts (at HSC Exam Grade 1, 2 or 3) or 3 unit Industrial Arts (at HSC Exam Grade 1, 2, 3 or 4)</td>
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<td>Students who wish to enrol in this subject can make up for the lack of the prerequisite by work taken in Physics in the first half of first year.</td>
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School of Electrical Engineering

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<td>Assembler Programming II and Non-numeric Computing</td>
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For footnotes, see overleaf
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<td>Compiling Techniques</td>
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* Offered only in the evening.

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#### Pure Mathematics

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<th>Co-requisites</th>
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<td>Linear Algebra</td>
<td>II</td>
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<td>Analysis</td>
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<td>10.1111</td>
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<td>II/III</td>
<td>½</td>
<td>S1</td>
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<td>10.111A, 10.111B, 10.121A</td>
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<td>Geometry</td>
<td>II/III</td>
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<td>S2</td>
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#### Higher Pure Mathematics Level II†

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<th>Co-requisites</th>
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<td>10.121B</td>
<td>Real and Complex Analysis</td>
<td>II</td>
<td>1</td>
<td>F</td>
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<td>10.011</td>
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<td>10.121C</td>
<td>Number Theory and Geometry</td>
<td>II/III</td>
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<td>F</td>
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<td>10.011</td>
<td>10.1112, 10.221A or 10.1121</td>
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</table>
# School of Mathematics (continued)

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**Pure Mathematics Level III***

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<td>Real Analysis</td>
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<td>10.122B</td>
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**Higher Pure Mathematics Level III**

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<td>10.122B</td>
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<td>10.122C</td>
<td>Topology and Differential Geometry</td>
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<td>Complex Analysis and Differential Equations</td>
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</table>

†† For any listed unit an appropriate higher unit may be substituted.
* † If a unit in this column is counted the corresponding unit in the first column may not be counted.
** For footnotes, see overleaf

1. Admission to Higher Pure Mathematics II normally requires completion of 10.011 Higher Mathematics I; students who gain a superior pass in 10.001 Mathematics I, subject to the approval of the Head of the School of Mathematics, be permitted to proceed to 10.011 Higher Pure Mathematics II units.
2. Students majoring in Physics who wish to take Higher Pure Mathematics II should attempt 10.121A, 10.121B and either 10.221A or 10.211A.
3. Students aiming at Honours in Pure Mathematics must take 10.121A, B and C and either 10.221A or 10.211A.
‡ Mathematics 10.032 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, Applied Mathematics or Theoretical Mechanics are taken, 10.032 Mathematics will not be counted.
** Students wishing to attempt Higher Level III units should consult with the School of Mathematics prior to enrolment. Pre- and co-requisites may be varied in special circumstances with the permission of the Head of the School.
*** Students will not normally be permitted to attempt a Level III Pure Mathematics unit unless they have completed at least one Level II unit from 10.111A, 10.111B and 10.211A and are concurrently attempting the remaining units of these three units.
†† May not be offered in 1977.

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## Applied Mathematics

### Applied Mathematics Level II

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### Higher Applied Mathematics Level II

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School of Mathematics (continued)

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†† For any listed unit an appropriate higher unit may be substituted.
** If a unit in this column is counted the corresponding unit in the first column may not be counted.
* With the permission of the Head of the Department a sufficiently good grading may be substituted.
† Effective from 1978 only. Students enrolling in 10.212L (10.222L) in 1977 should not enrol in 10.211D (10.221D)

Statistics

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* If a unit in this column is counted, the corresponding unit in the first column may not be counted.
† Plus any two Level III Pure Mathematics, or Applied Mathematics or Theoretical Mechanics units. It is sufficient to take 10.312B (10.322B) in the same year.
** For a student taking four of the units 10.312A, 10.312B, 10.312C, 10.312D, 10.312E (or the corresponding Higher units) a project is required as part of either 10.312C (10.322C) or 10.312E (10.322E).
†† For any listed unit an appropriate higher unit may be substituted.

---

### Theoretical and Applied Mechanics

#### Theoretical Mechanics Level II

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#### Higher Theoretical Mechanics Level II

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*For footnotes, see overleaf*
### School of Mathematics (continued)

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†† For any listed unit an appropriate higher unit may be substituted.

** If a unit in this column is counted the corresponding unit in the first column may not be counted.

† The evening course for 10.411B runs at 2 hours per week throughout the year.

* With the permission of the Head of the Department a sufficiently good grading may be substituted.

‡ It is recommended that one of the following be taken concurrently: 10.411A or 1.012 or 1.913

### School of Psychology

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12.052, 12.062 and 12.152 are prerequisites for any Level III unit

12.623

12.402 (Psych BSc)
Table 1: Board of Studies in Science and Mathematics (Units offered)

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* Reserved for approved potential Psychology IV candidates. Applicants must have completed 12.001, 12.052, 12.062 and 12.152 at an average level of Credit or better.

**Notes:**
1. A major in Psychology in the science and mathematics course is minimally satisfied by the completion of 9 units value of Psychology units which have included 12.001, 12.052, 12.062, 12.152 and four Level III units.
2. A double major in Psychology in the science and mathematics course adds an additional four Level III units to the four required for single major. The double major is available to students in the three year program and the four year program.
3. Not all Level III units will necessarily be offered in each year.

### General Biology

<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>
<th>Excluded</th>
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<tbody>
<tr>
<td>17.011</td>
<td>Biology of Mankind</td>
<td>I</td>
<td>1</td>
<td>S1</td>
<td>6</td>
<td>Science 2 or 4 units (at HSC Exam Grade 1, 2 or 3)</td>
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<tr>
<td>17.021</td>
<td>Comparative Functional Biology</td>
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<td>S2</td>
<td>6</td>
<td>17.011†</td>
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<tr>
<td>17.012</td>
<td>General Ecology</td>
<td>II</td>
<td>1</td>
<td>S1</td>
<td>6</td>
<td>17.011 and 17.021</td>
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</table>

† Terminating pass acceptable.
### School of Applied Geology

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<th>No.</th>
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<th>When Offered</th>
<th>Hpw</th>
<th>Prerequisites</th>
<th>Co-requisites</th>
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<tbody>
<tr>
<td>25.011*</td>
<td>Geology I</td>
<td>I</td>
<td>2</td>
<td>F</td>
<td>6</td>
<td>2 unit Science (any strands) (at HSC Exam Grade 1, 2 or 3) or 4 unit Science (any strands) (at HSC Exam Grade 1, 2 or 3)</td>
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<td>25.012**</td>
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<td>1</td>
<td>F</td>
<td>3</td>
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<td>25.023***</td>
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<td>III</td>
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<td>F</td>
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<td>25.012 and 25.022</td>
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<td>25.033***</td>
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<td>III</td>
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<td>F</td>
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<td>25.013 and 25.023</td>
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<tr>
<td>25.613†</td>
<td>Geogical Oceanography</td>
<td>III</td>
<td>1</td>
<td>S1</td>
<td>6</td>
<td>25.011 and 25.022</td>
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* Three field tutorials, up to five days in all, are an essential part of the course. Attendance is compulsory.
** Field work of up to six days in each case is a compulsory part of this course.
*** A geological survey camp of 10 days’ duration is a compulsory part of this course.
**** Field tutorials constitute an essential part of this course.
† Compulsory field work to be arranged.

### School of Geography

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Level</th>
<th>Unit</th>
<th>When Offered</th>
<th>Hpw</th>
<th>Prerequisites</th>
<th>Co-requisites</th>
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<td>27.801</td>
<td>Introduction to Physical Geography</td>
<td>I</td>
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<td>4½</td>
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<tr>
<td>27.802</td>
<td>Introduction to Human Geography</td>
<td>I</td>
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<tr>
<td>27.811</td>
<td>Physical Geography</td>
<td>II</td>
<td>1</td>
<td>S2</td>
<td>4½</td>
<td>27.801, 27.802, 27.813</td>
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<tr>
<td>27.812</td>
<td>Human Geography</td>
<td>II</td>
<td>1</td>
<td>S2</td>
<td>4½</td>
<td>27.813</td>
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<tr>
<td>27.813</td>
<td>Geographic Methods</td>
<td>II</td>
<td>1</td>
<td>S1</td>
<td>4</td>
<td>27.801, 27.802</td>
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<td>27.103</td>
<td>Climatology</td>
<td>II/III</td>
<td>1</td>
<td>S2</td>
<td>5</td>
<td>1.001, 27.801 and 27.813</td>
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<td>27.813 or 25.011</td>
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<tr>
<td>27.203</td>
<td>Biogeography</td>
<td>II/III</td>
<td>1</td>
<td>S1</td>
<td>5</td>
<td>27.801 and 27.813, or 17.011 and 17.021</td>
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<td>27.813 and 25.011, or 27.801 and 27.802</td>
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<tr>
<td>27.423</td>
<td>Pedology</td>
<td>II/III</td>
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<td>S2</td>
<td>5</td>
<td>Any Two (2) of: 2.111, 2.121, 2.131 and 27.813, and either 27.811 or 27.801 and 25.012 or 25.022</td>
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<td>27.823</td>
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<td>27.812, 27.813</td>
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<td>27.840</td>
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<td>S2</td>
<td>5</td>
<td>27.812 and 27.813, or 15.603 or 53.204 or 51.542</td>
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<tr>
<td>27.841</td>
<td>Population Geography</td>
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<td>S1</td>
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<td>27.812, 27.813, or 53.204</td>
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<td>27.860</td>
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### School of Geography (continued)

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<th>Hpw</th>
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<th>Co-requisites</th>
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<tbody>
<tr>
<td>27.862</td>
<td>Australian Environment and Land Resources</td>
<td>II/III</td>
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<td>S2</td>
<td>5</td>
<td>27.811 and 27.813 or 25.011</td>
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<tr>
<td>27.863</td>
<td>Soil, the Ecosystem and Man</td>
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<td>S1</td>
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<tr>
<td>27.833</td>
<td>Urban Geography (Advanced)</td>
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<td>27.850</td>
<td>Agricultural Geography (Advanced)</td>
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<td>27.812 (Cr), 27.813 (Cr)</td>
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<tr>
<td>27.851</td>
<td>Population Geography (Advanced)</td>
<td>III</td>
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<td>27.811 (Cr), 27.813 (Cr)</td>
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<td>27.872</td>
<td>Australian Environment and Land Resources</td>
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<td>S2</td>
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<td>27.811 (Cr), 27.813 (Cr)</td>
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<td>27.880</td>
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<td>S1</td>
<td>6</td>
<td>27.813 (Cr) and 27.811 (Cr) or 27.812 (Cr)</td>
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### School of Biochemistry‡

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<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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<tbody>
<tr>
<td>41.101</td>
<td>Introductory Biochemistry</td>
<td>II</td>
<td>2</td>
<td>S1</td>
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<td>Biochemical Control</td>
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<td>S2</td>
<td>6</td>
<td>41.101</td>
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<tr>
<td>41.102A</td>
<td>Biochemistry of Macromolecules</td>
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<td>S1</td>
<td>12</td>
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<td>41.102B</td>
<td>Physiological Biochemistry</td>
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<td>41.102C</td>
<td>Plant Biochemistry</td>
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<td>S2</td>
<td>6</td>
<td>41.101 and 2.002B</td>
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<tr>
<td>41.102D</td>
<td>Biosynthesis of Plant Metabolites</td>
<td>III</td>
<td>1</td>
<td>S2</td>
<td>6</td>
<td>41.101 and 2.002B</td>
<td>41.102C</td>
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</tr>
</tbody>
</table>

‡ Level III units available only during the daytime.
* In exceptional circumstances a student may apply to the Head of School for variation of the prerequisite.
† Terminating pass not acceptable.

### School of Biological Technology

<table>
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<tr>
<th>No.</th>
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<th>Level</th>
<th>Unit Value</th>
<th>When Offered</th>
<th>Hpw</th>
<th>Prerequisites*</th>
<th>Co-requisites</th>
<th>Excluded</th>
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<tbody>
<tr>
<td>42.101</td>
<td>Introduction to Biotechnology</td>
<td>II</td>
<td>1</td>
<td>S2</td>
<td>6</td>
<td>2.121, 2.131, 17.021, 10.001 or 10.01 or 10.021</td>
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<tr>
<td>42.102A</td>
<td>Biotechnology A</td>
<td>III</td>
<td>1</td>
<td>S1</td>
<td>6</td>
<td>41.101 and 42.101 or 44.101</td>
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<td>42.102B</td>
<td>Biotechnology B</td>
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<td>6</td>
<td>42.101</td>
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* In exceptional circumstances a student may apply to the Head of School for variation of the prerequisite.
### School of Microbiology

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<th>When</th>
<th>Value</th>
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<tr>
<td>44.132</td>
<td>Virology</td>
<td>II</td>
<td>S1</td>
<td>6</td>
<td>17.011 and 17.021</td>
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<tr>
<td>44.101</td>
<td>Introductory Microbiology</td>
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<td>S2</td>
<td>6</td>
<td>17.011 and 17.021</td>
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<td>44.111</td>
<td>General Microbiology</td>
<td>II</td>
<td>S2</td>
<td>6</td>
<td>17.011 and 17.021</td>
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<td>44.102</td>
<td>Applied Microbiology</td>
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<td>S2</td>
<td>6</td>
<td>17.011 and 17.021</td>
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<td>44.112</td>
<td>General Microbiology</td>
<td>II</td>
<td>S2</td>
<td>6</td>
<td>17.011 and 17.021</td>
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</table>

**Notes:**
- **All units available only during the daytime.**
- For students not interested in Major in Microbiology and not taking Level II Biochemistry. This unit is not acceptable as a prerequisite for Level III Microbiology.
- In exceptional circumstances, a student may apply to the Head of School for variation of the prerequisite.

---

Note: A student not admitted to Level III Botany units, without special permission of the Head of School, must take at least two Level II units in Biochemistry, or Chemistry, or Physics.

---

All units available only during the daytime except on the recommendation of the Head of School.
### Table 1: Board of Studies in Science and Mathematics (Units offered)

#### School of Zoology

<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>
<th>Excluded</th>
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<td>S1</td>
<td>6</td>
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<td>10.311A, 10.321A, 10.331</td>
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<td>45.201</td>
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<td>1</td>
<td>S2</td>
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<td>17.011, 17.021</td>
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<td>45.301</td>
<td>Vertebrate Zoology</td>
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<td>1</td>
<td>S2</td>
<td>6</td>
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<td>S1</td>
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<td>45.121</td>
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<td>S1</td>
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<td>S1</td>
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<td>45.101, 45.201, 45.301</td>
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<td>S2</td>
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<td>S2</td>
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<td>45.201, 45.301</td>
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<td>45.201</td>
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<td>S2</td>
<td>6</td>
<td>45.301</td>
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<td>45.122 or 45.132 or 45.142</td>
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<td>45.402</td>
<td>Insect Structure and Classification</td>
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<td>S1</td>
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<td>17.011, 17.021</td>
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<td>45.101†</td>
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<td>S2</td>
<td>6</td>
<td>45.412</td>
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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 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 of Biochemistry, or Chemistry, or Physics, or Mathematics, or Geology.

† Level III courses conducted by the School of Zoology are available only during the daytime to part-time students enrolling for the first time in 1973 or later.

* Students intending to enroll in this unit should register with the School of Zoology for the February field trip by 7 January.

† One of: 10.311A, 10.321A, 10.331 may be substituted for 45.101 with special permission of the Head of School.

### School of Philosophy

<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>
<th>Excluded</th>
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<tbody>
<tr>
<td>52.151</td>
<td>Plato</td>
<td>I</td>
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<td>2</td>
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<td>52.161</td>
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<td>½</td>
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<td>Nil</td>
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<td>Hume</td>
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N.B. 52.162, 52.172 and 52.182 will be timetabled at the same time.

* 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 two Level I Philosophy half-units in the same session. This prerequisite may be waived in certain cases by the School.
## School of History and Philosophy of Science

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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.

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## Table 2: Course 397—units available in specific programs

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† Compulsory field work to be arranged.
* Field tutorials are an essential part of this unit.
‡ Unit 1.913 may not be counted as a qualifying unit with 25.643
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.

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Table 3: Level IV units offered by the Board of Studies in Science and Mathematics

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Level</th>
<th>Unit Value</th>
<th>When offered</th>
<th>Prerequisites Years 1, 2 and 3 in</th>
<th>Number of Level III Units Required</th>
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</thead>
<tbody>
<tr>
<td>15.024</td>
<td>Geology IV</td>
<td>IV</td>
<td>2</td>
<td>F</td>
<td>See program 10.4</td>
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<tr>
<td>15.034</td>
<td>Geology IV</td>
<td>IV</td>
<td>2</td>
<td>F</td>
<td>See program 10.4</td>
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<tr>
<td>25.004</td>
<td>Geology IV</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 25.1, 25.2 or 27/25</td>
<td>8</td>
</tr>
<tr>
<td>27.604</td>
<td>Geography IV</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 27.1, 27.2, 27.3, 27/25</td>
<td>8</td>
</tr>
<tr>
<td>41.103</td>
<td>Biochemistry IV</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 41.1, 41.2, 2/41, 41/42,</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>41/44, 41/45, 41/70 or 41/73</td>
<td></td>
</tr>
<tr>
<td>42.103</td>
<td>Biotechnology IV</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 42.1, 42.2, 2/41, 41/42,</td>
<td>7</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>42/44</td>
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</tr>
<tr>
<td>43.103</td>
<td>Botany IV</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 43.1, 43.2, 43.3,</td>
<td></td>
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<tr>
<td>43.113</td>
<td>Botany project A</td>
<td>IV</td>
<td>8</td>
<td>F</td>
<td>43.4, 43.5, 43.6, 27/43, 41/43,</td>
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</tr>
<tr>
<td>43.123</td>
<td>Botany project B</td>
<td>IV</td>
<td>6</td>
<td>F</td>
<td>43/44 or 43/45</td>
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</tr>
<tr>
<td>43.133</td>
<td>Botany project C</td>
<td>IV</td>
<td>4</td>
<td>F</td>
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<td></td>
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<tr>
<td>43.143</td>
<td>Botany project D</td>
<td>IV</td>
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<td>F</td>
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<tr>
<td>44.513</td>
<td>General Microbiology</td>
<td>IV</td>
<td>2</td>
<td>S1</td>
<td>Program 44.1, 44.2, 44.3, 44.4,</td>
<td>8</td>
</tr>
<tr>
<td>44.523</td>
<td>Applied Microbiology</td>
<td>IV</td>
<td>2</td>
<td>S1</td>
<td>41/44, 42/44 or 43/44</td>
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<tr>
<td>44.533</td>
<td>Immunology</td>
<td>IV</td>
<td>2</td>
<td>S1</td>
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<tr>
<td>44.543</td>
<td>Virology</td>
<td>IV</td>
<td>2</td>
<td>S1</td>
<td>Program 44.1, 44.2, 44.3, 44.4,</td>
<td>8</td>
</tr>
<tr>
<td>44.553</td>
<td>Electron Microscopy</td>
<td>IV</td>
<td>2</td>
<td>F</td>
<td>41/44, 42/44 or 43/44</td>
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</tr>
<tr>
<td>44.563</td>
<td>Microbiology Project I</td>
<td>IV</td>
<td>2</td>
<td>F</td>
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<tr>
<td>44.573</td>
<td>Microbiology Project II</td>
<td>IV</td>
<td>4</td>
<td>F</td>
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<tr>
<td>44.583</td>
<td>Microbiology Project III</td>
<td>IV</td>
<td>6</td>
<td>F</td>
<td></td>
<td></td>
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<tr>
<td>45.103</td>
<td>Zoology IV</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 45.1, 45.2, 45.3, 45.4,</td>
<td>8</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>45.5, 45.6, 45.7, 45.8, 45.9, 45.10,</td>
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<td></td>
<td></td>
<td>45.11, 45.12, 45.13, 41/45</td>
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<tr>
<td>62.014</td>
<td>History and Philosophy of Science</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 62.1, 62/70</td>
<td>8</td>
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<tr>
<td>68.004</td>
<td>Marine Science IV</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 68.32, 68.33 or 68.34</td>
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<tr>
<td>70.013</td>
<td>Anatomy IV</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 70/68, 70.1, 70.2, 41/70,</td>
<td>8</td>
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<td>70/73</td>
<td></td>
</tr>
<tr>
<td>73.013</td>
<td>Physiology IV</td>
<td>IV</td>
<td>10</td>
<td>F</td>
<td>Program 73.1, 41/73 or 70/73</td>
<td>8</td>
</tr>
</tbody>
</table>

* Higher level units of Mathematics must be included in Year 1, 2 and 3 in order to comply with the prerequisites for admission to Level IV Mathematics. Since entry to fourth year is only with approval of the Head of School, students should discuss their third year program with a Professor of the Department concerned. In special circumstances additional prerequisites may be required, or some of those listed may be waived.

§ Students are required to complete the prerequisite program with better than passing grades in the relevant studied subjects. In all cases a student considering proceeding to Level IV studies should seek the guidance of the Head of the appropriate School at an early stage of study to ensure that the program being followed is best suited to lead into the Level IV units and that special prerequisites are complied with.
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 (397) and the Faculty supervises the undergraduate course in Psychology (343). The Schools of the Faculty also offer facilities for students to proceed to the award of masters degrees and the degree of Doctor of Philosophy.

Students requiring advice about the undergraduate course should contact
School of Psychology                Dr P. J. Cleary
                                      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 343

343 Psychology Degree Course
Full-time course
Bachelor of Science
BSc

The four year course in Psychology, which leads to the award of the degree of Bachelor of Science, 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 selected from the School’s advanced electives. Electives are offered in the major areas of general psychology and in a number of applied fields, eg clinical, social, industrial and human factors. In addition, each student must complete a research thesis or project.

Details of the qualifications required for admission to the Psychology Course leading to the award of BSc, the course requirements for Pass and Honours at graduation and rules governing admission with advanced standing are given below. Hours of attendance for the main subjects available in the course are shown in the Schedule of Course Subjects, together with some recommended course patterns.

Rules governing the Psychology Course

1. Applicants for admission to the Course must be matriculated to this University; and also have either satisfied the entrance requirements for 10.001 Mathematics I or 10.021 Mathematics IT or 17.011 Biology of Mankind and 17.021 Comparative Functional Biology.

2. A. In order to qualify for admission to the award of degree of BSc in Psychology under these regulations a candidate must attend classes and satisfy the examiners in the following subjects:

   1. Each of:
      12.001 Psychology I
      12.042 Psychology IIA
      12.052 Basic Psychological Processes II
      12.062 Complex Psychological Processes II
      12.152 Research Methods II
      12.153 Research Methods IIA
      12.163 Research Methods IIIA
      12.163 Research Methods IIIB
      and

   A total value of 6 Level III units of Psychology
   (In special cases, the Head of the School of Psychology or his representative may approve of the substitution of any other appropriate course or equivalent units), and
   12.004 Psychology IV.

* Any student who enrolled in the former BSc in Applied Psychology Course prior to 1973 on a part-time basis may continue enrolling on that basis, provided that the course of study is completed within the minimum time plus two years.
2. **Five other subjects** (or their equivalent in units) selected to meet the following requirements:

A that they shall include at least one of:

(a) 10.011 Higher Mathematics I, or 10.001 Mathematics I or 10.021 Mathematics IT 

or

(b) 17.011 Biology of Mankind and 17.021 Comparative Functional Biology. 

[They may include both (a) and (b).]

B that they shall include at least one of:

53.103 Introduction to Contemporary Industrial Society and 53.104 Introduction to Social Theory or 15.001 Economics IA and 15.011 Economics IB or 54.901 Australian Politics A or Australian Politics B, and either 54.902 Comparative Politics or 54.903 Some Major Political Theories or Four of 52.151 Plato, 52.161 Informal Logic, 52.171 Philosophy of Religion, 52.152 Hume, 52.162 Formal Logic and 52.182 Political Philosophy.

or with the approval of the Head of the School of Psychology, one other Arts I subject or two General Studies electives.

C that they shall include at least one subject which together with the subject meeting the requirements of A or B immediately above constitutes a recognized sequence of two courses.

Recognized sequences are:

(a) 10.001 Mathematics I, followed by three Mathematics Level II units (10.111A, 10.111B, 10.211A) or by both of 10.311A Probability and Random Variables and 10.311B Statistical Inference;

(b) 17.011 Biology of Mankind and 17.021 Comparative Functional Biology followed by 12.402 Physiological Psychology, or by the equivalent of one subject (three Level II units are equivalent to one Level II subject) chosen from the following units according to the regulations of the Board of Studies in Science and Mathematics:

- 41.101 Principles of Biochemistry (equivalent to 2 units)
- 41.111 Biochemical Control
- 43.101 Genetics
- 45.101 Biometry
- 45.301 Vertebrate Zoology
- 73.011A Principles of Physiology (equivalent to 2 units)

(c) Sociology followed by two units value of Sociology Upper Level units

Economics IA and Economics IB followed by two units value of Economics Upper Level units

Two of Political Science Level I followed by two units value of Political Science Upper Level units

Four of Philosophy Level I followed by two units value of Philosophy Upper Level units.

B 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 will fit in with the timetable.

C 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 co-requisites 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 or to the Calendar for a statement of subject prerequisites and/or co-requisites.

4. The award of the degree of BSc in Psychology at graduation shall be 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 with exemptions from no more than five subjects or their unit equivalents completed by them. No more than two Psychology subjects may be included in the subjects exempted.

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. Some supporting studies in mathematics and/or biology, of which a minimum of one course is compulsory;
3. Some supporting studies in the social sciences, of which a minimum of one course is compulsory; and

4. The special needs, interests and academic or vocational background of individual students when the balance of the five supporting subjects (or their equivalents in units) is selected, in consultation with the Head of School or his representative.

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 patterns of supporting subjects in consultation with the Head of the School or his representative before completing enrolment. For such students, some examples of patterns, based on supporting subject variants, are suggested below:

<table>
<thead>
<tr>
<th>Compulsory Psychology Subjects for all Courses</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsory Psychology</td>
<td>12.001</td>
<td>12.052, 12.062, 12.152 and 12.153, 12.163, and 6 other</td>
<td>12.153, 12.163, and 6 other</td>
<td>12.004</td>
</tr>
<tr>
<td>Courses</td>
<td></td>
<td>Psychology Level III units</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main Supporting Subject:</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pure Mathematics</td>
<td>10.001</td>
<td>10.111A, 10.111B and 10.211A</td>
<td>An approved Level I or II Subject*</td>
</tr>
<tr>
<td>Social Science Subject I*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any approved Level I Subject*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statistics</td>
<td>10.001</td>
<td>10.111A unit, 10.111B unit, 10.211A unit</td>
<td>4 Pure Mathematics Level III unit value</td>
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<tr>
<td>A Social Science Subject I*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any approved Level I Subject*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biochemistry</td>
<td>17.011 and 17.021, 2.121 and 2.131, 10.001 or 10.021</td>
<td>41.101</td>
<td>A Social Science Subject I*</td>
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<tr>
<td>Zoology</td>
<td>17.011 and 17.021, 2.121 and 2.131, 10.001 or 10.021</td>
<td>45.301</td>
<td>A Social Science Subject I*</td>
</tr>
<tr>
<td>Physiology</td>
<td>17.011 and 17.021, 2.121 and 2.131, 10.001 or 10.021</td>
<td>73.011A</td>
<td>A Social Science Subject I*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>43.101 or 45.101</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>A Social Science Subject I*</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Any approved Level I or II Subject*</td>
<td></td>
</tr>
<tr>
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<td></td>
<td>Any approved Level I or II Subject*</td>
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<tr>
<td></td>
<td>17.011 and 17.021, 2.121 and 2.131, 10.001 or 10.021</td>
<td>73.011A</td>
<td>A Social Science Subject I*</td>
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<td></td>
<td></td>
<td>10.331</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>or A Pure Maths II unit</td>
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</tr>
<tr>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
<td>Year 4</td>
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<tr>
<td><strong>Social Science</strong> Subject</td>
<td>Social Science Subject (A) I*</td>
<td>Social Science Subject (A) II*</td>
<td>Social Science Subject (A) III*</td>
</tr>
<tr>
<td>2 Yrs A Social Science Subject (A) I*</td>
<td>10.001 or 10.001 or 10.021 or 17.011 and 17.021 Any approved Level I Subject*</td>
<td>Social Science Subject (A) II*</td>
<td>An approved Level I or II Subject*</td>
</tr>
<tr>
<td>*<em>3 Yrs A Social Science Subject (A) I</em></td>
<td>10.001 or 10.001 or 10.021 or 17.011 and 17.021 Any approved Level I Subject*</td>
<td>Social Science Subject (A) III*</td>
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</tr>
<tr>
<td><strong>General</strong> Social Science Subject (A) I*</td>
<td>Social Science Subject (A) II*</td>
<td>Social Science Subject (A) II*</td>
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</tr>
<tr>
<td>3 Yrs A Social Science Subject (A) I*</td>
<td>10.001 or 10.001 or 10.021 or 17.011 and 17.021 Any approved Level I Subject*</td>
<td>Social Science Subject (B) I*</td>
<td>Any approved Level I or II Subject*</td>
</tr>
<tr>
<td><strong>General</strong> Social Science Subject (A) I*</td>
<td>17.011 and 17.021</td>
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<td>10.001 or 10.021</td>
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</table>

* Or equivalent units.

---

**Schedule: Main Psychology Course Subjects**

Key: S1 (Session 1); S2 (Session 2); F (Full year); U (Upper)

<table>
<thead>
<tr>
<th>No.</th>
<th>Subject or Unit</th>
<th>Level</th>
<th>Hpw</th>
<th>When Offered</th>
<th>Prerequisites</th>
<th>Co-requisites</th>
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<tbody>
<tr>
<td>12.001</td>
<td>Psychology I</td>
<td>I</td>
<td>5</td>
<td>F</td>
<td>12.001</td>
<td>12.052, 12.062 and 12.152</td>
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<tr>
<td>12.042</td>
<td>Psychology II A</td>
<td>II</td>
<td>4</td>
<td>F</td>
<td>12.001</td>
<td>12.052, 12.062 and 12.152</td>
</tr>
<tr>
<td>12.052</td>
<td>Basic Psychological Processes II</td>
<td>II</td>
<td>4</td>
<td>S1</td>
<td>12.001</td>
<td>12.152</td>
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<tr>
<td>12.062</td>
<td>Complex Psychological Processes II</td>
<td>II</td>
<td>4</td>
<td>S2</td>
<td>12.001</td>
<td>12.152</td>
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<td>12.152</td>
<td>Research Methods II</td>
<td>II</td>
<td>3</td>
<td>F</td>
<td>12.001</td>
<td>12.052 and 12.062</td>
</tr>
<tr>
<td>12.153</td>
<td>Research Methods III A</td>
<td>III</td>
<td>4</td>
<td>S1</td>
<td>12.052, 12.062 and 12.152</td>
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</tr>
<tr>
<td>12.163</td>
<td>Research Methods III B 6 Psychology units</td>
<td>III</td>
<td>12</td>
<td>F</td>
<td>12.052, 12.062 and 12.152</td>
<td></td>
</tr>
<tr>
<td>12.004</td>
<td>Psychology IV</td>
<td>IV</td>
<td>15</td>
<td>F</td>
<td>All other Course requirements</td>
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<tr>
<td>12.402</td>
<td>Physiological Psychology</td>
<td>II</td>
<td>4</td>
<td>F</td>
<td>12.001, 17.011 and 17.021</td>
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</table>

Continued overleaf
### Schedule: Main Psychology Course Subjects (continued)

<table>
<thead>
<tr>
<th>No.</th>
<th>Subject Code</th>
<th>Subject Title</th>
<th>Level</th>
<th>Hrs</th>
<th>When Offered</th>
<th>Prerequisites</th>
<th>Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.001</td>
<td>Mathematics I</td>
<td>I</td>
<td>6</td>
<td>F</td>
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<tr>
<td>10.011</td>
<td>Higher Mathematics I</td>
<td>I</td>
<td>6</td>
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<td></td>
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<tr>
<td>10.021</td>
<td>Mathematics II</td>
<td>I</td>
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<td>F</td>
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<tr>
<td>10.111A</td>
<td>Pure Mathematics II</td>
<td>II</td>
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<td>F</td>
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<td>10.001 or 10.011</td>
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<tr>
<td>10.111B</td>
<td>Applied Mathematics II</td>
<td>II</td>
<td>6</td>
<td>F</td>
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<tr>
<td>10.211A</td>
<td>Theory of Statistics II</td>
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<td>10.001 or 10.011</td>
<td>or 10.021 Cr.</td>
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<td>10.311A</td>
<td>Higher Theory of Statistics II</td>
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<td>10.001 or 10.011</td>
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<td>10.321B</td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

| Human Biology | 17.011 | Biology of Mankind                  | I      | 6   | S1 | 17.011 and 17.021 |
|              | 17.021 | Comparative Functional Biology      | I      | 6   | S2 | 41.101 |

| Biochemistry Units§ | 41.101 | Principles of Biochemistry | II | 12 | S1 | 10.001 or 10.011 or 10.021 |
|                     | 41.111 | Biochemical Control         | II | 6  | S2 | 41.101 |

| Zoology Units§ | 43.101 | Genetics                   | II | 6  | S2 | 17.011 and 17.012 |
|                | 45.101 | Biometry                   | II | 6  | S1 | Choose 2 of 2.111, 2.121 or 2.131 |
|                | 45.301 | Vertebrate Zoology         | II | 6  | S2 | 10.001 or 10.011 or 10.021 |

| Physiology Units§ | 73.011A | Principles of Physiology (Equiv. Unit Value = 2) | II | 6 | F | 17.011 and 17.021 |
|                   |         |                                                      |     |   |   | 2.121 or 2.131 |
|                   |         |                                                      |     |   |   | 10.001 or 10.011 or 10.021 |

| Economics†        | 2 units | Economics     | I |   |   |                     |               |
|                   | 2 units | Economics U   |   |   |   |                     |               |

| Philosophy†       | 2 units | Philosophy    | I |   |   |                     |               |
|                   | 2 units | Philosophy U  |   |   |   |                     |               |

| Sociology†        | 2 units | Sociology     | I |   |   |                     |               |
|                   | 2 units | Sociology U   |   |   |   |                     |               |

| Political Science†| 2 units | Political Science | I |   |   |                     |               |
|                  | 2 units | Political Science U | | | | | |

§ For details of Level II and Level III Science and Mathematics units, including pre- and co-requisites, refer to Science and Mathematics Course details. If units are taken, three Level II units are equivalent to one Level II subject; four Level III units are equivalent to one Level III subject.

† For details of Arts units, refer to the Faculty of Arts Handbook.
Faculty of Science

Introduction

The Schools of the Faculty of Science contribute programs to the Science and Mathematics Course (397) and the Faculty supervises undergraduate courses in Pure and Applied Chemistry (391) and Optometry (395) and the Graduate Diploma courses Food and Drug Analysis (551) and Current Science (552). The Schools of the Faculty also offer facilities for students to proceed to Masters Degrees in Chemistry (877), Mathematics (874), Optometry (876), Physics (873) and Statistics (875), 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 courses should contact the representative of the appropriate School:

School of Chemistry ... Mr W. J. Dunstan
School of Optometry ... Professor J. Lederer

Students requiring information about the postgraduate studies which are available should seek advice from:

Graduate Diploma in Current Science ... Associate Professor D. H. Morton
Graduate Diploma in Food and Drug Analysis ... Associate Professor E. R. Cole

or

in the case of Masters and Doctors degrees from:
School of Chemistry ... Professor G. W. K. Cavill
School of Mathematics ... Associate Professor I. H. Sloan
School of Physics ... Professor H. J. Goldsmid
Course Outlines

391
Pure and Applied Chemistry Course

Specialization in Chemistry

While some students will wish to include a small number of chemistry units in courses leading to major studies in other disciplines, there will be others who wish to specialize in chemistry to varying degrees.

1. Major in Chemistry in the Science and Mathematics Course. For purposes of graduation Science course regulations require students to study a minimum of four Level III units in related disciplines, such a combination being regarded as major study in that discipline or group of disciplines.

When studies in chemistry are required to be regarded as being major studies at least seven units of chemistry must be included after completing Chemistry I and these must include at least three of the four Level II units.

Students wishing to take 8 or more Level III Chemistry units are required to transfer to the Pure and Applied Chemistry Course (391) before the commencement of Year 2. If Year 2 studied in the Science and Mathematics course is similar to Year 2 of Course 391, the transfer may still be made before the commencement of Year 3.

2. Pure and Applied Chemistry Course. This course which allows intensive specialization in chemistry according to a prescribed pattern, leads to the award of the Bachelor of Science degree, and is administered by the Faculty of Science. It may be taken at pass or honours standard. The pass course requires full-time attendance at the University for three years. An additional year is required for the honours degree. The program may also be taken on a part-time basis over six years for the pass degree.

A total of 23 units is required for graduation at the pass level. First year is similar to the Science and Mathematics Course and covers 8 units. Of the remaining 15 units at least 12 must be chemistry units and must include the following:

2.002A, 2.002B, 2.002D, 2.003A, 2.003B, 2.003C, 2.003D, 2.003H, 2.013A, 2.042C

The remaining 3 units may be chosen from any of the Science and Mathematics course topics, but no more than 2 may be at Level I.

In all cases prerequisites, co-requisites and exclusions are similar to those prescribed for the units in the Science and Mathematics course.

Electives offered by the School of Chemistry

<table>
<thead>
<tr>
<th>Level</th>
<th>No.</th>
<th>Title</th>
<th>Prerequisites</th>
<th>Co-requisites</th>
<th>Excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>II/III</td>
<td>2.003E</td>
<td>Nuclear and Radiation</td>
<td>2.121 and 2.131</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemistry</td>
<td>10.001 or</td>
<td>10.011 or</td>
<td>10.021</td>
</tr>
</tbody>
</table>
### Faculty of Science: Course Outlines: 391

<table>
<thead>
<tr>
<th>Level</th>
<th>No.</th>
<th>Title</th>
<th>Prerequisites</th>
<th>Co-requisites</th>
<th>Excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>II/III</td>
<td>2.003H</td>
<td>Molecular Spectroscopy and Structure</td>
<td>2.121 and 2.131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II/III</td>
<td>2.003J</td>
<td>Fundamentals of Biological Chemistry</td>
<td>2.121 and 2.131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II/III</td>
<td>2.003K</td>
<td>Solid State Chemistry</td>
<td>2.131 and 10.001 or 10.011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II/III</td>
<td>2.013A</td>
<td>Introductory Quantum Chemistry</td>
<td>1.001 or 1.011 and 2.121 and 2.131</td>
<td>10.001 or 10.011 or 10.021</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.003A</td>
<td>Physical Chemistry</td>
<td>2.002A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.003B</td>
<td>Organic Chemistry</td>
<td>2.002B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.003C</td>
<td>Inorganic Chemistry</td>
<td>2.042C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.003D</td>
<td>Instrumental Analysis</td>
<td>2.002D and 2.002A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.003L</td>
<td>Applied Organic Chemistry</td>
<td>2.002B 2.033L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.003M</td>
<td>Organometallic Chemistry</td>
<td>2.002B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.013B</td>
<td>Synthetic Organic Chemistry</td>
<td>2.003B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.013C</td>
<td>Advanced Inorganic Chemistry</td>
<td>2.042C 2.003C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.013D</td>
<td>Advanced Inorganic Chemistry</td>
<td>2.002D 2.003D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.013L</td>
<td>Chemistry and Enzymology of Foods</td>
<td>2.002B 2.043L</td>
<td>2.023L, 2.023L, 2.035L</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.013M</td>
<td>Thermo-Chemistry</td>
<td>2.002A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.023A</td>
<td>Chemical Physics</td>
<td>2.002A and 10.211A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.023B</td>
<td>Natural Product Chemistry</td>
<td>2.003B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.023L</td>
<td>Biological and Agricultural Chemistry</td>
<td>2.002B 2.053L, 2.013L, 2.043L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.033A</td>
<td>Physical Chemistry of Macromolecules</td>
<td>2.003J or 2.003B and 2.002B and 2.002C or 1.112C or 2.002A</td>
<td>2.002A</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.033L</td>
<td>Applied Organic Chemistry (double unit)†</td>
<td>2.002B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>2.043A</td>
<td>Environmental Chemistry</td>
<td>2.002A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

† Only one of these double units may be chosen.

### 391

**Pure and Applied Chemistry**

**Full-time Course**

**Bachelor of Science**

**BSc**

**Year 1**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.011 Higher Physics I or 1.001 Physics I</td>
<td>6</td>
</tr>
<tr>
<td>2.121 Chemistry IA and 2.131 Chemistry IB</td>
<td>6</td>
</tr>
<tr>
<td>10.001 Higher Mathematics I or 10.011 Mathematics I</td>
<td>6</td>
</tr>
<tr>
<td>10.021 Mathematics IT</td>
<td></td>
</tr>
</tbody>
</table>

**Plus one of**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.010 Engineering A and 5.020 Engineering B</td>
<td>6</td>
</tr>
<tr>
<td>5.030 Engineering C or 17.011 Biology of Mankind and 17.021 Comparative Functional Biology</td>
<td>6</td>
</tr>
<tr>
<td>25.011 Geology I* or 25.151 Geoscience IA or 27.801 Introduction to Physical Geography and 27.802 Introduction to Human Geography</td>
<td>6</td>
</tr>
</tbody>
</table>

* Three field excursions, up to five days in all, are an essential part of the course.
Year 2
2.002A Physical Chemistry 3
2.002B Organic Chemistry 3
2.002D Analytical Chemistry 3
2.003H Molecular Spectroscopy and Structure 3
2.042C Inorganic Chemistry 3
Science Electives* (2 units) 6
Two General Studies Electives 3

24

* To be chosen from units in the Science and Mathematics course in accordance with Science course requirements. The following are recommended.

Mathematics
10.031 Mathematics 2
10.331 Statistics SS 2
10.111A Mathematics II 6
10.211A

Physics
Choose 2 of
1.912 Geometric Optics 3
1.922 Electronics
1.932 Introduction to Solids

Biological Sciences
17.011 Biology of Mankind 6
17.021 Comparative Functional Biology
41.101 Introductory Biochemistry
44.101 Principles of Physiology 6
73.011A Biological Studies Elective

Year 3
2.003B Organic Chemistry 3
2.003C Inorganic Chemistry 3
2.003D Analytical Chemistry 3
2.013A Introductory Quantum Chemistry 3
Advanced Electives* (4 units) 12
One General Studies Elective 1½

25½

* Chosen from Level II/III or Level III units offered by the School of Chemistry in the Science and Mathematics course and in accordance with Science and Mathematics course regulations.

Year 4 Honours
As prescribed by the School.

Part-time Course
The part-time course in Pure and Applied Chemistry is equivalent to the full-time course and extends over six part-time years, leading to the award of the degree of Bachelor of Science. Honours may be awarded on the completion of an additional year of full-time study or, in special circumstances, an additional two years of part-time study.

The part-time course has been designed for students employed in the chemical industry but employment in this industry is not obligatory for entrance to the course.

391
Pure and Applied Chemistry
Part-time course
Bachelor of Science
BSc

Stages 1 and 2
Two of the following subjects are taken in the first year and the other two in the second year (as directed).

<table>
<thead>
<tr>
<th>Hours per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.011 Higher Physics I or 6</td>
</tr>
<tr>
<td>1.001 Mathematics I 6</td>
</tr>
<tr>
<td>2.121 Chemistry IA and 6</td>
</tr>
<tr>
<td>2.131 Chemistry IB</td>
</tr>
<tr>
<td>10.001 Mathematics I or 6</td>
</tr>
<tr>
<td>10.021 Mathematics IT</td>
</tr>
<tr>
<td>5.010 Engineering A and 6</td>
</tr>
<tr>
<td>5.020 Engineering B or</td>
</tr>
<tr>
<td>5.030 Engineering C or</td>
</tr>
<tr>
<td>17.011 Biology of Mankind and 6</td>
</tr>
<tr>
<td>17.021 Comparative Functional Biology or</td>
</tr>
<tr>
<td>25.011 Geology I* 6</td>
</tr>
<tr>
<td>25.151 Geoscience IA or</td>
</tr>
<tr>
<td>27.801 Introduction to Physical Geography** and 6</td>
</tr>
<tr>
<td>27.802 Introduction to Human Geography**</td>
</tr>
</tbody>
</table>

* Three field excursions, up to five days in all, are an essential part of the course.
** Field work (to be arranged by the School of Geography) is a compulsory component of each unit.

Stage 3
2.002A Physical Chemistry 3
2.042C Inorganic Chemistry 3
Science Electives* (two units) 6

12

Stage 4
2.002B Organic Chemistry 3
2.002D Analytical Chemistry 3
2.003H Molecular Spectroscopy and Structure 3
General Studies Electives 6

12
Stage 5
2.003B Organic Chemistry 3
2.003C Inorganic Chemistry 3
2.003D Instrumental Analysis 3
2.013A Introductory Quantum Chemistry 3
General Studies Elective 1½
13½

Stage 6
Advanced Electives* (4 units) 12
* See footnote under Year 3 full-time course.

Honours
The requirements for admission to the honours course are the same as for the full-time course. A student wishing to do honours on a part-time basis may complete the honours year over two part-time years. Students are, however, advised to make every effort to do the honours year full time.

395 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 qualified 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.

395 Optometry—Full-time course
Bachelor of Optometry
BOptom

Year 1
1.001 Physics I 6
2.121 Chemistry IA 6
2.131 Chemistry IB 6
10.001 Mathematics I or
10.011 Higher Mathematics I or
10.021 Mathematics IT
17.011 Biology of Mankind and
17.021 Comparative Functional Biology

Year 2
31.811 Optometry I 8
31.821 Special Anatomy and Physiology 6
73.011A Principles of Physiology
General Studies Elective 1½
21½

Year 3
12.001 Psychology I 5
31.812 Optometry II 15
31.831 Diseases of the Eye 3
Two General Studies Electives 3
26

Year 4
12.741 Psychology 2 2
31.813 Optometry III 6 6
31.841 Clinical Optometry 15 14
74.001 Indication for Medical Referral 0 1
General Studies Elective 1½ 1½
24½ 24½

Conditions for the award of the double degree 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 double degree 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 and Mathematics 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, ie a person may be admitted under these rules if he has met all requirements for a first degree which has not yet been conferred on him, and his admission under these rules shall be no bar to the subsequent award of the first degree.
Graduate Study
Conditions for the Award of Higher Degree
Subject Descriptions and Textbooks

Sciences
Enrolment Procedures

Graduate Study

Higher Degree Research Programs

New Students
Students seeking admission to Higher Degree (Research) must make application on the appropriate form which should be submitted to the Registrar. Successful applicants will be advised by letter concerning the method of enrolment.

Re-enrolling Students
Candidates registered for Higher Degrees (Research) are required to re-enrol at the commencement of each academic year. Unless advised to the contrary candidates should obtain re-enrolment forms and advice on procedure and fees from the office of the appropriate School after 1 January 1977. Each candidate must complete a re-enrolment form and submit it to the Cashier. (See Enrolment Procedures earlier in this handbook).

A candidate who has completed all the work for a graduate degree except for the submission of a thesis is required to re-enrol as above unless the thesis is submitted by 18 March 1977 in which case the candidate is not required to re-enrol.

Masters Degree and Graduate Diploma Courses

New Students
Students seeking admission to formal masters courses and graduate diploma courses are required to apply on the appropriate form and by the closing date specified for the particular course. Unless advised to the contrary successful applicants are required to attend for enrolment at the appropriate time and place as listed below. The letter offering a place must be taken to the enrolment centre.

Re-enrolling Students
Candidates continuing formal graduate courses including those who have completed their formal examination but have not submitted their project report are required to attend for re-enrolment at the appropriate time and place as listed below:

Faculty of Biological Sciences
Master of Science (Biotechnology)
Biochemical Engineering (GradDip)
Room L112, Biological Sciences Building
Friday 4 March
2.00 pm to 5.00 pm
6.00 pm to 8.00 pm

Master of Psychology (MPsychol)
New Students
School of Psychology
Room 924
The Sciences Building
Monday 7 March
10.00 am to 12.00 noon

Continuing Students
School of Psychology
Room 828
The Sciences Building
Thursday 3 March
2.00 pm to 5.00 pm

Note: All formal masters degree courses and graduate diploma students must lodge an authorized enrolment form with the Cashier on the day the enrolling office signs the form. (See Enrolment Procedures earlier in this handbook.)
### Faculty of Science

**Current Science (GradDip)**

Room W/G12  
Newton Building  
(Applied Physics)  
Friday 4 March  
2.00 pm to 5.00 pm  
6.00 pm to 8.00 pm  
or by arrangement with the School

**Food and Drug Analysis (DipFDA)**

Room 422  
Robert Heffron Building  
(Chemistry)  
Friday 4 March  
2.00 pm to 5.00 pm  
6.00 pm to 8.00 pm  
or by arrangement with the School

**Master of Chemistry (MChem)**

Unisearch House  
Friday 4 March  
2.00 pm to 5.00 pm

**Master of Mathematics (MMath)**

Room 1519  
Sciences Building  
Tuesday 1 March  
4.00 pm

**Master of Optometry (MOptom)**

Unisearch House  
Tuesday 1 March  
2.00 pm to 5.00 pm

**Master of Physics (MPhysics)**

Graduate Office  
Room 61  
Main Building  
Friday 4 March  
2.00 pm to 5.00 pm  
6.00 pm to 7.30 pm

**Master of Statistics (MStats)**

Room 1205  
Sciences Building  
Tuesday 1 March  
4.00 pm

### Qualifying Programs

(for admission to Higher Degree Candidature)

Students may enrol in such programs after approval has been obtained from the relevant Higher Degree Committee.

Unless advised to the contrary successful applicants are required to attend for enrolment at the appropriate time and place as listed below. The letter offering a place must be taken to the enrolment centre.

Candidates who are continuing a qualifying program are required to attend for re-enrolment at the appropriate time and place as listed below.

Note: All qualifying students must lodge an authorised enrolment form with the Cashier on the day the enrolling officer signs the form. (See Enrolment Procedures earlier in this handbook.)
Faculty of Biological Sciences and
Faculty of Science

Graduate Study

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 Biological Technology offers a graduate diploma course in Biochemical Engineering and a Master’s course in Biotechnology by formal study, and the School of Psychology offers a Master of Psychology course with specializations in Experimental Clinical and Psychodynamic Clinical Psychology.

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.

Candidates enrolled in the Alternative Qualifying Program are exempt from student service fees.

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 Biological Technology Honours
43.103 Botany Honours
44.103 Microbiology Honours
12.014 Psychology IV (Research)
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 may be admitted as external qualifying students to a program equivalent to a standard Honours year. The following are the alternative qualifying subjects:

41.999G Biochemistry
42.999G Biological Technology
43.999G Botany
44.999G Microbiology
12.999G Psychology
45.999G Zoology

The results in alternative qualifying subjects are graded Pass or Fail only.
Biological Technology

532 Biochemical Engineering Graduate Diploma Course GradDip

The School of Biological Technology, conjointly with the School of Chemical Engineering, 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.

Hours per week

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours S1</th>
<th>Hours S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.481G</td>
<td>Mass Heat and Momentum Transfer</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>3.482G</td>
<td>Thermodynamics</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>3.483G</td>
<td>Process Dynamics and Biochemical Engineering Design</td>
<td>0 8</td>
<td></td>
</tr>
<tr>
<td>42.211G</td>
<td>Principles of Biology</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>42.212G</td>
<td>Principles of Biochemistry</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>42.213G</td>
<td>Biochemical Methods</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>42.214G</td>
<td>Biotechnology</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>44.111G</td>
<td>Microbiology</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>17</td>
<td>17</td>
</tr>
</tbody>
</table>

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.

826 Master of Science (Biotechnology) MSc(Biotech)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours S1</th>
<th>Hours S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>42.301G</td>
<td>Microorganism Productivity</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>42.302G</td>
<td>Enzyme Technology</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>42.303G</td>
<td>Microbial Process Control</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>42.304G</td>
<td>Biodeterioration and Biodegradation</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>42.305G</td>
<td>Case Studies</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>42.306G</td>
<td>Project</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>17</td>
<td>19</td>
</tr>
</tbody>
</table>

Psychology

The School of Psychology offers graduate training at the Master’s level (Master of Psychology).

Master of Psychology

The course is designed to provide professional training at an advanced level for honours graduates.

The normal entrance requirements are: 1. A degree of Bachelor with Honours Class I or Class II in Psychology; and 2. 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. Prerequisite courses may vary according to the specialization being undertaken for the award of the Master’s degree.

A student who does not satisfy the above requirements may be permitted to undertake a qualifying course prescribed by the Head of the School, satisfactory completion of which will be accepted as meeting entrance requirements.

Selection of students will be based on academic qualifications and suitability for the course. It may be necessary to limit the number of new enrolments in any year. Intending students are referred to conditions for the award of graduate degrees set out later in this handbook.

The course consists of lectures, seminars, demonstrations, practical work, supervised clinical and community work, and a research thesis. The minimum period of registration before the award of the degree is three 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.
In each of the first two sessions, full-time students must undertake 10 units of study (a unit is defined as two hours of course work per week extending over the whole of the session). Four units of study must be selected from Section I. At least three of the Section I units must be taken from one of 12.221G, 12.232G or 12.235G. The remainder of the four units required must be selected in consultation with the Head of the School. Two units of study must be selected from Section II, but, in special circumstances, an approved program of study may be substituted for all or part of Section II. All four units in Section III are compulsory.

In addition, a total of 250 hours of professional practice must be completed in the first year of the course. The content of the practical work must be related to the choice of units from Section I.

In Year 2, five units of study must be undertaken. Two units must be selected from Section I, and the whole of Section II must be included. In addition, a further 200 hours of professional practice must be completed.

Part-time students normally will be expected to take half the full-time program in any one session.

825 Master of Psychology
MPsychol

Year 1
Sessions 1 and 2

Section I (at least 4 units are to be taken)

| Unit Value |  
|------------|---|
| 12.221G Experimental Analysis and Modification of Problem Behaviour | 4 |
| 12.232G Theory and Practice of Psychodynamic Therapy | 4 |
| 12.235G Community Psychology | 4 |

Section II (usually 2 units are to be taken)

| Unit Value |  
|------------|---|
| 12.236G Community Health | 1 |
| 16.904G Australian Health Care System | 1 |
| 12.233G Psychodiagnosis and Clinical Assessment | 1 |
| 12.238G Group Techniques | 1 |

Section III (compulsory)

| Unit Value |  
|------------|---|
| 12.239G Research Methods in Clinical and Community Psychology | 1 |
| 12.228G Research Project | 1 |
| 12.240G Graduate Seminar | 1 |
| 12.241G Graduate Colloquium | 1 |
| 12.231G Professional Practice (250 hours) | 2 |

Year 2
Session 1

Section I (2 units are to be taken)

| Unit Value |  
|------------|---|
| 12.221G Experimental Analysis and Modification of Problem Behaviour | 2 |
| 12.232G Theory and Practice of Psychodynamic Therapy | 2 |
| 12.235G Community Psychology | 2 |

Section II (compulsory)

| UV |  
|---------------------------------|---|
| 12.240G Graduate Seminar | 1 |
| 12.228G Research Project | 2 |
| 12.231G Professional Practice (200 hours) | 2 |

Faculty of Science

Facilities are available in each of the Schools for research leading to 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 Graduate Diploma in Current Science
- School of History and Philosophy of Science Master of Science and Society
- School of Optometry Master of Optometry
- School of Chemistry Master of Chemistry Graduate Diploma in Food and Drug Analysis
- School of Mathematics* Master of Mathematics Master of Statistics
- School of Physics Master 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.

*The School of Mathematics also offers the pass degree of MA (see the Faculty of Arts Handbook).
The Faculty of Science offers to graduates and professional workers in science and science-based disciplines a course designed to enable them to renew their acquaintance with basic aspects of their subject and to learn of the latest developments in that area or in some other area or areas of science that have become of importance to their current work.

552 Graduate Diploma Course in Current Science Grad Dip

In order to qualify for the award, a candidate must pursue a program of studies selected from the current list of the subjects offered in the Graduate Diploma course, and approved by the Higher Degree Committee of the Faculty on the recommendation of the Coordinator of Studies. A candidate must complete the approved course, comprising at least 12 units of study, within 2 years. The unit values of the subjects offered are stated in the table below. A unit comprises approximately 28 hours of tuition in the case of subjects not involving laboratory or similar exercises, or approximately 42 hours if laboratory, computing or other work is involved.

An approved course normally extends over two years, but in special cases approval may be given to a course that would satisfy requirements for the award of the Graduate Diploma in one year of full-time study.

The subjects offered are in general designed so that any practising scientist (or engineer, etc.) can pursue any of them effectively and profitably. Dependent upon an adequate number of candidates in each, the subjects offered are:

<table>
<thead>
<tr>
<th>Unit value</th>
<th>Subject Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.119G</td>
<td>Basic Solid-State Physics</td>
</tr>
<tr>
<td>1.129G</td>
<td>Solid-State Device Physics</td>
</tr>
<tr>
<td>1.139G</td>
<td>Biophysics</td>
</tr>
<tr>
<td>1.149G</td>
<td>Physical and Applied Acoustics</td>
</tr>
<tr>
<td>1.319G</td>
<td>Measurement and Data-Handling</td>
</tr>
<tr>
<td>1.329G</td>
<td>The Physics of Strong Materials</td>
</tr>
<tr>
<td>1.519G</td>
<td>Laser Physics and Applications</td>
</tr>
<tr>
<td>2.150G</td>
<td>Chemistry of Natural and Synthetic High Polymers</td>
</tr>
<tr>
<td>2.251G</td>
<td>Toxicology, Occupational and Public Health</td>
</tr>
<tr>
<td>2.153G</td>
<td>Recent Advances in Chemistry</td>
</tr>
<tr>
<td>2.154G</td>
<td>Advanced Analytical Chemistry</td>
</tr>
<tr>
<td>2.155G</td>
<td>and Chemical Instrumentation,</td>
</tr>
<tr>
<td>2.156G</td>
<td>Units A, B &amp; C</td>
</tr>
<tr>
<td>4.261G</td>
<td>Modern Microscopy of Materials</td>
</tr>
<tr>
<td>10.372G</td>
<td>Statistics and Experimental Design</td>
</tr>
<tr>
<td>10.373G</td>
<td>Advanced Mathematical Analysis of Data</td>
</tr>
<tr>
<td>10.401G</td>
<td>Seiches and Tides</td>
</tr>
<tr>
<td>97.010G</td>
<td>Basic FORTRAN IV Programming I &amp; II</td>
</tr>
<tr>
<td>42.211G</td>
<td>Principles of Biology</td>
</tr>
<tr>
<td>42.212G</td>
<td>Principles of Biochemistry</td>
</tr>
<tr>
<td>42.401G</td>
<td>Chemical Transformations in the Environment</td>
</tr>
<tr>
<td>44.111</td>
<td>Microbiology</td>
</tr>
<tr>
<td>97.0049</td>
<td>Psychology of Communication</td>
</tr>
<tr>
<td>97.0329</td>
<td>Basic Information Theory</td>
</tr>
</tbody>
</table>

To maintain the current nature of the Graduate Diploma course the Faculty from time to time may at short notice incorporate new or modified units offered by this or other Faculties and may delete existing units.

877 Master of Chemistry MChem

The Master of Chemistry Course should be of interest to chemistry graduates who are involved in the practice or teaching of analytical chemistry. The program consists of a number of lecture courses (examinable). In addition, each student undertakes a critical literature survey or review or a short research project. Laboratory instruction (experience) and visits to laboratories are also included in the course. The course is full-time. In future the course may also be extended to part-time students. Details of the program are:

1. 2.581G Advanced Analytical Chemistry Lecture Courses

Students are required to take all of the following nine core courses of lectures:

A Analytical flame spectroscopy;
B Advanced electrochemical analysis;
C Chromatography;
D Analytical chemistry of pollutants;
E Emission, IR, Mass and XRF spectroscopy;
F Calculations and statistics in analytical chemistry;
G Chemical analysis of organic and biological materials;
H Operations and applications of minicomputers in chemistry;
I Chemical microscopy.

The lecture time for the whole course is a minimum of 140 hours in a full year.

2. Laboratory Instruction (Experience) and Visits to Laboratories

An additional minimum of 150 hours is spent by students in one full year in selected areas of laboratory practice, instruction and visits to laboratories.

3. Research Project or Critical Literature Survey

A short research project (with report) of approximately 4 months duration full-time (400 hours laboratory work) may be selected in relation to the combined interests of the student and his supervisor. If the student requires more varied experi-
ence, a series of shorter projects may be carried out in two or three areas of analytical chemistry. Alternatively, each student may undertake a survey of the literature in a field of interest to himself and present a critical review in the form of a report.

Assessment
Each lecture course is examined separately. Each report is assessed by two examiners. The students may also be required to undergo an oral examination.

551
Food and Drug Analysis Graduate Diploma GradDip

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 practise as public analysts. 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.

<table>
<thead>
<tr>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part-time</strong></td>
</tr>
<tr>
<td>2.231G Foods and Drugs I</td>
</tr>
<tr>
<td>2.371G Treatment of Analytical Data</td>
</tr>
<tr>
<td>2.281G Instrumental Techniques in Food and Drug Analysis</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.242G Food and Drugs II</td>
</tr>
<tr>
<td>Pharmacognosy and Microscopy of Crude Drugs</td>
</tr>
<tr>
<td>2.251G Toxicology, Occupational and Public Health</td>
</tr>
<tr>
<td>44.111 Microbiology</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

* 5 hours per week for 8 weeks in latter part of year.
† For 20 weeks.

878
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 class-work and additional private study.

The following 4 core units are common to the programs of all candidates:
62.701G Philosophy and Methodology of Science
62.702G Logic and Strategy of Scientific Progress
26.567G Interdisciplinary Seminars and Project*

Candidates may select 4 further units from the following groupings initially offered from 1977:

A 62.703G Technology and Society in the Twentieth Century
62.704G Science, Technology and Social Responsibility
B 53.306G Science and Government I
53.307G Science and Government II
C 15.715G Science, Society and Institutions
15.716G Science, Technology and Economic Development
D 62.705G Science and the Military-Industrial Complex I
62.706G Science and the Military-Industrial Complex II

Students may undertake a third-year MScSoc honours program of advanced study which includes a dissertation based on supervised research into particular aspects of the relationships between science and technology and science and its institutions.

* 2 units.

Mathematics

The School of Mathematics offers graduate courses leading to the award of the degrees of Master of Mathematics (MMath) and Master of Statistics (MStats). (The School also offers the pass degree of MA. For further details see the Faculty of Arts Handbook.)
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 persons specializing in the teaching of mathematics in tertiary institutions. In addition an appropriate program may provide training for those employed or seeking employment in the area of industrial mathematics.

The program consists of seven lecture courses, the duration of each being two hours per week for one session. With the approval of the Head of the School of Mathematics a student may substitute for one or more of these lecture courses a reading course supervised by a member of staff. Again with this approval a student may substitute for at most two of these courses graduate courses offered either within or outside the School of Mathematics. Students are also required to participate in relevant departmental seminars. In addition, students are required to undertake a project supervised by a staff member, consisting of either a critical review of the literature in a specific field of mathematics, or a short research project. It is anticipated that students will spend three hours per week for two sessions on their project. Each candidate's proposed program of study requires the approval of the Head of the School of Mathematics.

The conditions for the award of the degree are set out later in this handbook.

The Master of Statistics Course covers a wide range of statistical theory and practice and provides advanced training for practising statisticians. The course may be completed in two years of full-time or four years of part-time study, and it is available to graduates with a pass degree in statistics or an honours degree in a related field (commonly mathematics) with supporting study in statistics. Honours graduates in statistics may be exempted from a maximum of half the course. The conditions for the award of the degree are set out 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.

<table>
<thead>
<tr>
<th>Compulsory Subjects</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.381G Experimental Design I</td>
<td>2</td>
</tr>
<tr>
<td>10.383G Stochastic Processes</td>
<td>2</td>
</tr>
<tr>
<td>10.385G Multivariate Analysis I</td>
<td>2</td>
</tr>
<tr>
<td>10.390G Statistical Inference</td>
<td>2</td>
</tr>
<tr>
<td>10.392G Project</td>
<td>2</td>
</tr>
</tbody>
</table>

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.
Elective Graduate Subjects

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hpw</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.702G</td>
<td>Advanced Physiological Optics</td>
<td>4</td>
</tr>
<tr>
<td>31.703G</td>
<td>Pleorhoptics and Binocular Vision</td>
<td>4</td>
</tr>
<tr>
<td>31.704G</td>
<td>Advanced Contact Lens Studies</td>
<td>4</td>
</tr>
<tr>
<td>31.705G</td>
<td>Advanced Contact Lens Practice</td>
<td>4</td>
</tr>
<tr>
<td>31.706G</td>
<td>Occupational Optometry</td>
<td>4</td>
</tr>
<tr>
<td>31.707G</td>
<td>Clinical Photography</td>
<td>4</td>
</tr>
</tbody>
</table>

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:

**Specialization Graduate Subjects**

**Contact Lenses**
1. (a) Advanced Contact Lens Studies
2. Advanced Contact Lens Practice
3. Clinical Photography
4. Advanced Physiological Optics

**Occupational Optometry**
1. Occupational Optometry
2. Pleorhoptics and Binocular Vision
3. Advanced Physiological Optics

**Orthoptics**
1. Pleorhoptics and Binocular Vision
2. Clinical Photography

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**Physics**

The School of Physics offers a graduate course leading to the award of the Master of Physics degree (MPhysics). The course is intended for honours graduates, but others may be admitted after completing a qualifying course. It may be completed in one year of full-time study or two years of part-time study. The conditions for the award are set out later in this handbook.

The course consists of two core subjects, six elective subjects and either a short research project or a critical literature survey in a specified field of physics. The core subjects each occupy two hours per week for two sessions and are treated primarily by formal lectures. The elective subjects each occupy the equivalent of one hour per week for two sessions and are treated in seminars. The critical literature survey or research project occupies a total of approximately 250 hours. All core and elective subjects are examined and, in addition, students are required to submit a report on their research project or literature survey.
Conditions for the Award of Higher Degrees

**First Degrees**  
Rules, regulations and conditions for the award of first degrees are set out in the appropriate Faculty Handbooks.

For the list of undergraduate courses and degrees offered see Disciplines of the University: Faculty Table (Undergraduate Study) in the Calendar.

**Higher Degrees**  
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: Faculty Table (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.

<table>
<thead>
<tr>
<th>Title</th>
<th>Abbreviation</th>
<th>Calendar/Handbook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor of Science</td>
<td>DSc</td>
<td>Calendar</td>
</tr>
<tr>
<td>Doctor of Letters</td>
<td>DLitt</td>
<td>Calendar</td>
</tr>
<tr>
<td>Doctor of Laws</td>
<td>LLD</td>
<td>Calendar</td>
</tr>
<tr>
<td>Doctor of Medicine in the Faculty of Medicine</td>
<td>MD</td>
<td>Calendar, Medicine</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>PhD</td>
<td>Calendar, and all faculties</td>
</tr>
<tr>
<td>Master of Applied Science</td>
<td>MAppSc</td>
<td>Applied Science</td>
</tr>
<tr>
<td>Master of Architecture</td>
<td>MArch</td>
<td>Architecture</td>
</tr>
<tr>
<td>Master of Arts</td>
<td>MA(Hons)</td>
<td>Arts, Military Studies, Arts</td>
</tr>
<tr>
<td></td>
<td>MA</td>
<td>Military Studies</td>
</tr>
</tbody>
</table>

* Not including General Studies Handbook.
<table>
<thead>
<tr>
<th>Title</th>
<th>Abbreviation</th>
<th>Calendar/Handbook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Building</td>
<td>MBuild</td>
<td>Architecture</td>
</tr>
<tr>
<td>Master of Business Administration</td>
<td>MBA</td>
<td>Commerce**</td>
</tr>
<tr>
<td>Master of Business Administration</td>
<td>MBA</td>
<td>AGSM</td>
</tr>
<tr>
<td>Master of Chemistry by Formal Course Work</td>
<td>MChem</td>
<td>Sciences*</td>
</tr>
<tr>
<td>Master of Commerce (Honours)</td>
<td>MCom(Hons)</td>
<td>Commerce</td>
</tr>
<tr>
<td>Master of Commerce by Formal Course Work</td>
<td>MCom</td>
<td>Commerce</td>
</tr>
<tr>
<td>Master of Education</td>
<td>MEd</td>
<td>Professional Studies</td>
</tr>
<tr>
<td>Master of Engineering</td>
<td>ME</td>
<td>Applied Science</td>
</tr>
<tr>
<td>Master of Engineering without Supervision</td>
<td></td>
<td>Engineering</td>
</tr>
<tr>
<td>Master of Engineering Science</td>
<td>MEngSc</td>
<td>Engineering</td>
</tr>
<tr>
<td>Master of General Studies</td>
<td>MGenStud</td>
<td>General Studies</td>
</tr>
<tr>
<td>Master of Health Administration</td>
<td>MHA</td>
<td>Professional Studies</td>
</tr>
<tr>
<td>Master of Health Personnel Education</td>
<td>MHP</td>
<td>Calendar†</td>
</tr>
<tr>
<td>Master of Health Planning</td>
<td>MHP</td>
<td>Professional Studies</td>
</tr>
<tr>
<td>Master of Landscape Architecture</td>
<td>MLArch</td>
<td>Architecture</td>
</tr>
<tr>
<td>Master of Laws by Research</td>
<td>LLM</td>
<td>Law</td>
</tr>
<tr>
<td>Master of Librarianship by Formal Course Work</td>
<td>MLib</td>
<td>Professional Studies</td>
</tr>
<tr>
<td>Master of Librarianship by Research</td>
<td></td>
<td>Sciences*</td>
</tr>
<tr>
<td>Master of Mathematics</td>
<td>MMath</td>
<td>Sciences*</td>
</tr>
<tr>
<td>Master of Optometry</td>
<td>MOptom</td>
<td>Sciences*</td>
</tr>
<tr>
<td>Master of Physics</td>
<td>MPhysics</td>
<td>Sciences*</td>
</tr>
<tr>
<td>Master of Psychology</td>
<td>MPsychol</td>
<td>Sciences‡</td>
</tr>
<tr>
<td>Master of Public Administration</td>
<td>MPA</td>
<td>AGSM</td>
</tr>
<tr>
<td>Master of Science</td>
<td>MSc</td>
<td>Applied Science</td>
</tr>
<tr>
<td>Master of Science without Supervision</td>
<td></td>
<td>Engineering</td>
</tr>
<tr>
<td>Master of Science (Acoustics)</td>
<td>MSc(Acoustics)</td>
<td>Architecture</td>
</tr>
<tr>
<td>Master of Science and Society by Formal Course Work</td>
<td>MScSoc</td>
<td>Sciences*</td>
</tr>
<tr>
<td>Master of Science (Biototechnology)</td>
<td>MSc(Biotech)</td>
<td>Sciences‡</td>
</tr>
<tr>
<td>Master of Science (Building)</td>
<td>MSc(Building)</td>
<td>Architecture</td>
</tr>
<tr>
<td>Master of Science (Building Services)</td>
<td>MSc(Building Services)</td>
<td>Architecture</td>
</tr>
<tr>
<td>Master of Social Work by Research</td>
<td>MSW</td>
<td>Professional Studies</td>
</tr>
<tr>
<td>Master of Social Work by Formal Course Work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master of Statistics</td>
<td>MStats</td>
<td>Sciences*</td>
</tr>
<tr>
<td>Master of Surgery</td>
<td>MS</td>
<td>Medicine</td>
</tr>
<tr>
<td>Master of Surveying</td>
<td>MSurv</td>
<td>Engineering</td>
</tr>
<tr>
<td>Master of Surveying without Supervision</td>
<td>MSurvSc</td>
<td>Engineering</td>
</tr>
<tr>
<td>Master of Surveying Science</td>
<td></td>
<td>Architecture</td>
</tr>
<tr>
<td>Master of Town Planning</td>
<td>MTP</td>
<td>Architecture</td>
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Graduate Diplomas

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** Course withdrawn at end of 1977.
* Faculty of Science.
† Professorial Board.
‡ Faculty of Biological Sciences.

Doctor of Philosophy (PhD)

1. The degree of Doctor of Philosophy may be granted by the Council on the recommendation of the Professorial Board to a candidate who has made an original and significant contribution to knowledge and who has satisfied the following requirements:

Qualifications

2. A candidate for registration for the degree of Doctor of Philosophy shall:

A hold an honours degree from the University of New South Wales; or

B hold an honours degree of equivalent standing from another approved university; or

C if he holds a degree without honours from the University of New South Wales or other approved university, has achieved by subsequent work and study a standard recognised by the appropriate Faculty or Board of Studies as equivalent to honours; or

D in exceptional cases, submit such other evidence of general and professional qualifications as may be approved by the Professorial Board on the recommendation of the Faculty or Board of Studies.

3. When the Faculty or Board of Studies is not satisfied with the qualifications submitted by a candidate, the Faculty or Board of Studies may require him, before he is permitted to register, to undergo such examination or carry out such work as the Faculty or Board of Studies may prescribe.

Registration

4. A candidate for registration for a course of study leading to the degree of Doctor of Philosophy shall:

A apply to the Registrar on the prescribed form at least one calendar month before the commencement of the session in which he desires to register; and

B submit with his application a certificate from the head of the University school in which he proposes to study stating that the candidate is a fit person to undertake a course of study and research leading to the degree of Doctor of Philosophy and that the school is willing to undertake the responsibility of supervising the work of the candidate and of reporting to the Faculty or Board of Studies at the end of the course on the merits of the candidate's performance in the prescribed course.
5. Subsequent to registration the candidate shall pursue a program of advanced study and research for at least six academic sessions, save that:

A a candidate fully engaged in advanced study and research for his degree, who before registration was engaged upon research to the satisfaction of the Faculty or Board of Studies, may be exempted from not more than two academic sessions;

B in special circumstances the Faculty or Board of Studies may grant permission for the candidate to spend not more than one calendar year of his program in advanced study and research at another institution provided that his work can be supervised in a manner satisfactory to the Faculty or Board of Studies;

C in exceptional cases, the Professorial Board on the recommendation of the Faculty or Board of Studies may grant permission for a candidate to be exempted from not more than two academic sessions.

6. A candidate who is fully engaged in research for the degree shall present himself for examination not later than ten academic sessions from the date of his registration. A candidate not fully engaged in research shall present himself for examination not later than twelve academic sessions from the date of his registration. In special cases an extension of these times may be granted by the Faculty or Board of Studies.

7. The candidate shall be required to devote his whole time to advanced study and research, save that:

A the Faculty or Board of Studies may permit a candidate on application to undertake a limited amount of University teaching or outside work which in its judgment will not interfere with the continuous pursuit of the proposed course of advanced study and research;

B a member of the full-time staff of the University may be accepted as a part-time candidate for the degree, in which case the Faculty or Board of Studies shall prescribe a minimum period for the duration of the program;

C in special circumstances, the Faculty or Board of Studies may, with the concurrence of the Professorial Board, accept as a part-time candidate for the degree a person who is not a member of the full-time staff of the University and is engaged in an occupation which, in its opinion, leaves the candidate substantially free to pursue his program in a school of the University. In such a case the Faculty or Board of Studies shall prescribe for the duration of his program a minimum period which, in its opinion, having regard to the proportion of his time which he is able to devote to the program in the appropriate University school is equivalent to the six sessions ordinarily required.

8. Every candidate shall pursue his program under the direction of a supervisor appointed by the Faculty or Board of Studies from the full-time members of the University staff. The work, other than field work, shall be carried out in a School of the University save that in special cases the Faculty or Board of Studies may permit candidates to conduct their work at other places where special facilities not possessed by the University may be available. Such permission will be granted only if the direction of the work remains wholly under the control of the supervisor.

9. Not later than two academic sessions after registration the candidate shall submit the topic of his research for approval by the Faculty or Board of Studies. After the topic has been approved it may not be changed except with the permission of the Faculty or Board of Studies.

10. A candidate may be required by the Faculty or Board of Studies to attend a formal course of study appropriate to his work.

11. On completing his course of study every candidate must submit a thesis which complies with the following requirements:

A the greater proportion of the work described must have been completed subsequent to registration for the PhD degree;
B it must be an original and significant contribution to the knowledge of the subject;

C it must be written in English except that a candidate in the Faculty of Arts may be required by the faculty on the recommendation of the supervisor to write the thesis in an appropriate foreign language;

D it must reach a satisfactory standard of expression and presentation.

12. The thesis must present the candidate's own account of his research. In special cases work done conjointly with other persons may be accepted, provided the Faculty or Board of Studies is satisfied on the candidate's part in the joint research.

13. Every candidate shall be required to submit with his thesis a short abstract of the thesis comprising not more than 600 words.

The abstract shall indicate:

A the problem investigated;
B the procedures followed;
C the general results obtained;
D the major conclusions reached;

but shall not contain any illustrative matter, such as tables, graphs or charts.

14. A candidate may not submit as the main content of his thesis any work or material which he has previously submitted for a university degree or other similar award.

15. The candidate shall give in writing two months' notice of his intention to submit his thesis and such notice shall be accompanied by the appropriate fee.

16. Four copies of the thesis shall be submitted together with a certificate from the supervisor that the candidate has completed the course of study prescribed in his case. The 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 higher degree theses.* The candidate may also submit any work he has published whether or not such work is related to the thesis.

17. 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.

18. There shall normally be three examiners of the thesis, appointed by the Professorial Board on the recommendation of the Faculty or Board of Studies, at least one of whom shall be an external examiner.

19. After examining the thesis the examiners may:

A decide that the thesis reaches a satisfactory standard; or
B recommend that the candidate be required to re-submit his thesis in revised form after a further period of study and/or research; or
C recommend without further test that the candidate be not awarded the degree of Doctor of Philosophy.

20. If the thesis reaches the required standard, the examiners shall arrange for the candidate to be examined orally, and, at their discretion, by written papers and/or practical examinations on the subject of the thesis and/or subjects relevant thereto, save that on the recommendation of the examiners the Faculty or Board of Studies may dispense with the oral examination.

* See Conditions for the Award of Degrees in the Calendar.
21. If the thesis is of satisfactory standard but the candidate fails to satisfy the examiners at the oral or other examinations, the examiners may recommend the University to permit the candidate to represent the same thesis and submit to a further oral, practical or written examination within a period specified by them but not exceeding eighteen months.

22. At the conclusion of the examination, the examiners will submit to the Faculty or Board of Studies a concise report on the merits of the thesis and on the examination results, and the Faculty or Board of Studies shall recommend whether or not the candidate may be admitted to the degree.

23. A candidate shall be required to pay such fees as may be determined from time to time by the Council.

1. An application to register for the degree of Master of Chemistry by formal course work shall be made on the prescribed form which shall be lodged with the Registrar at least six weeks before the commencement of the term in which the candidate desires to register.

2. A An applicant for registration shall hold an approved degree of Bachelor with Class I or Class II honours in Chemistry.

B An applicant for registration with an approved degree at a standard below honours Class II may be accepted following satisfactory performance at a qualifying examination approved by the Faculty of Science.

C In special circumstances a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainments as may be approved by the Faculty of Science on the recommendation of its Higher Degree Committee.

3. A candidate for the degree shall be required to undertake the appropriate course of study and pass the prescribed examinations. Under the supervision of a member of the academic staff, a candidate shall be required to write a critical review of the literature or present a report on a short research project (approximately 400 hours laboratory work) to be assessed by two examiners.

4. Three copies of the report shall be submitted by the candidate and shall be retained by the University. The University shall be free to allow the report to be consulted or borrowed and, subject to the provisions of the Copyright Act, 1968 the University may issue the report in whole or in part, in photostat or microfilm or other copying medium.

5. An approved applicant shall register as either a full-time or part-time student and shall pay such fees as may be determined from time to time by the Council.

6. A candidate shall not be considered for the award of the degree until the lapse of one academic year from the date of registration in the case of a full-time candidate or two academic years from the date of registration in the case of a part-time candidate.

1. The degree of Master of Engineering may be granted by the Council on the recommendation of the Professorial Board to a candidate who has demonstrated ability to carry out research by the submission of a thesis embodying the results of an original investigation.

2. An application to register as a candidate for the degree of Master of Engineering shall be made on the prescribed form which shall be lodged with the Registrar at least one full calendar month before the commencement of the session in which the candidate desires to register.
3. A An applicant for registration for the degree shall have been admitted to the degree of Bachelor in the University of New South Wales, or other approved University, in an appropriate school.

B In exceptional cases a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainment as may be approved by the Professorial Board on the recommendation of the appropriate Faculty (hereinafter referred to as 'the Faculty').

4. Notwithstanding any other provisions of these conditions, the Faculty may require an applicant to demonstrate fitness for registration by carrying out such work and sitting for such examinations as the Faculty may determine.

5. In every case, before permitting an applicant to register as a candidate, the Faculty shall be satisfied that adequate supervision and facilities are available.

6. An approved applicant shall register in one of the following categories:
   A student in full-time attendance at the University;
   B student in part-time attendance at the University;
   C student working externally to the University;

and shall pay such fees as may be determined from time to time by the Council.

7. Every candidate for the degree shall be required to carry out a program of advanced study, to take such examinations and perform such other work as may be prescribed by the Faculty. The program shall include the preparation and submission of a thesis embodying the results of an original investigation, three copies of which shall be presented in a form which complies with the requirements of the University for the preparation and submission of higher degree theses.* The candidate may submit any work he has published whether or not such work is related to the thesis.

8. 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.

9. The investigation and other work as provided in paragraph 7, shall be carried out under the direction of a supervisor appointed by the Faculty or under such conditions as the Faculty may determine.

10. No candidate shall be considered for the award of the degree until the lapse of four complete sessions from the date from which registration becomes effective save that, in the case of a candidate who obtained the degree of Bachelor with Honours or who has had previous research experience, this period may, with the approval of the Faculty, be reduced by up to two sessions.

11. For each candidate there shall be at least two examiners appointed by the Professorial Board, on the recommendation of the Faculty, one of whom shall, if possible, be an external examiner.

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Master of Mathematics (MMath)

1. An application to register for the degree of Master of Mathematics by formal course work shall be made on the prescribed form which shall be lodged with the Registrar at least six weeks before the commencement of the session in which the candidate desires to register.

2. A An applicant for registration shall hold an approved degree of Bachelor with Class I or Class II honours in Mathematics.

* See Conditions for the Award of Degrees in the Calendar.
B An applicant for registration, with an approved degree at a standard below honours Class II may be accepted following satisfactory performance at a qualifying examination approved by the Faculty of Science.

C In special circumstances a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainments as may be approved by the Faculty of Science on the recommendation of its Higher Degree Committee.

3. A candidate for the degree shall be required to undertake the appropriate course of study and pass the prescribed examinations. Under the supervision of a member of the academic staff, a candidate shall be required to submit a report consisting of a critical review of the literature in an approved branch of Mathematics or a report on a short research project. In either case the report will be assessed by two examiners, and the candidate may be required to attend an oral examination. The report is to be presented in a form approved by the Head of the School of Mathematics.

4. An approved applicant shall register as either a full-time or part-time student and shall pay such fees as may be determined from time to time by the Council.

5. A candidate shall not be considered for the award of the degree until the lapse of one academic year from the date of registration in the case of a full-time candidate or two academic years from the date of registration in the case of a part-time candidate.
In special circumstances a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainments as may be approved by the Faculty of Science on the recommendation of its Higher Degree Committee.

3. A candidate for the degree shall be required to undertake the appropriate course of study and pass the prescribed examinations. Under the supervision of a member of the academic staff, a candidate shall be required to submit a report consisting of a critical review of the literature in an approved branch of Physics or a report on a short research project. In either case the report will be assessed by two examiners, and the candidate may be required to attend an oral examination. The report is to be presented in a form approved by the Head of the School of Physics.

4. An approved applicant shall register as either a full-time or part-time student and shall pay such fees as may be determined from time to time by the Council.

5. A candidate shall not be considered for the award of the degree until the lapse of one academic year from the date of registration in the case of a full-time candidate or two academic years from the date of registration in the case of a part-time candidate.

Master of Psychology (MPsychol)

1. An application to register for the degree of Master of Psychology shall be made on the prescribed form which shall be lodged with the Registrar at least six weeks before the commencement of the academic year.

2. An applicant for registration shall hold an approved degree of Bachelor with Honours Class I or Class II in Psychology.

B An applicant for registration, with an approved degree at a standard below Honours Class II, may be accepted following satisfactory completion of a qualifying course and examination approved by the Faculty of Biological Sciences.

C In special cases a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainments as may be approved by the Faculty of Biological Sciences on the recommendation of its Higher Degree Committee.

3. Notwithstanding any other provisions of these conditions, the Faculty of Biological Sciences may require an applicant to demonstrate fitness for registration by carrying out such work and sitting for such examinations as the Faculty may determine.

4. A candidate for the degree shall be required to undertake the specified courses of advanced study and pass the prescribed examinations. Under the supervision of a member of the academic staff, a candidate shall be required to undertake a specified research project, the satisfactory completion of which shall be regarded as part of the examinations.

5. An approved applicant shall register as a student in full-time or part-time attendance at the University.

6. The minimum period of registration before the award of the degree shall be three sessions for full-time students, and six sessions for part-time students.

7. 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.

8. An approved candidate shall pay such fees as may be determined from time to time by the Council.
1. The degree of Master of Science may be granted by the Council on the recommendation of the Professorial Board to a candidate who has demonstrated ability to undertake research by the submission of a thesis embodying the results of an original investigation.

2. An application to register as a candidate for the degree of Master of Science shall be made on the prescribed form which shall be lodged with the Registrar at least one full calendar month before the commencement of the session in which the candidate desires to register.

3. A An applicant for registration for the degree shall have been admitted to the degree of Bachelor of Science in the University of New South Wales, or other approved University, in an appropriate School or Department.

B In exceptional cases a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainments as may be approved by the Professorial Board on the recommendation of the appropriate Faculty or Board of Studies.

4. Notwithstanding any other provisions of these conditions the Faculty or Board of Studies may require an applicant to demonstrate fitness for registration by carrying out such work and sitting for such examinations as the Faculty or Board of Studies may determine.

5. In every case before permitting an applicant to register as a candidate the Faculty or Board of Studies shall be satisfied that adequate supervision and facilities are available.

6. An approved applicant shall register in one of the following categories:

A student in full-time attendance at the University;

B student in part-time attendance at the University;

C student working externally to the University;

and shall pay such fees as may be determined from time to time by the Council.

7. Every candidate for the degree shall be required to submit three copies of a thesis embodying the results of an original investigation or design, to take such examinations and to perform such other work as may be prescribed by the Faculty or Board of Studies. 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. The candidate may submit also for examination any work he has published whether or not such work is related to the thesis.

8. 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.

9. The investigation, design and other work as provided in paragraph 7, shall be carried out under the direction of a supervisor appointed by the Faculty or Board of Studies or under such conditions as the Faculty or Board of Studies may determine.

At least once a year and at any other time that the Higher Degree Committee sees fit, the candidate’s supervisor shall present to the Head of School in which the candidate is registered a report on the progress of the candidate. The Committee shall review the report and as a result of its review may cancel registration or take such other action as it considers appropriate.

10. Unless otherwise recommended by the Committee, no candidate shall be awarded the degree until the lapse of four complete sessions from the date of registration, save that in the case of a candidate who obtained the degree of Bachelor with Honours or who has had previous research experience, this period may be reduced by up to two sessions with the approval of the Committee. A candidate who is fully engaged in research for the degree shall present himself for examination not later than six academic sessions from the date

*See Conditions for the Award of Degrees in the Calendar.
of registration. A candidate not fully engaged in research shall present himself for examination not later than twelve academic sessions from the date of his registration. In special cases an extension of these times may be granted by the Committee.

11. A A candidate shall give in writing to the Registrar two months’ notice of his intention to submit his thesis.

B For each candidate there shall be at least two examiners, appointed by the Professorial Board on the recommendation of the Committee, one of whom, if possible, shall be external to the University.

C After examining the thesis an examiner may:

1. recommend that the candidate be awarded the degree without further examination

or

2. recommend that the candidate be awarded the degree subject to minor corrections as listed being made to the satisfaction of the Head of School

or

3. recommend that the candidate be not awarded the degree but be permitted to resubmit his thesis in a revised form after a further period of study and/or research

or

4. recommend that the candidate be not awarded the degree and be not permitted to resubmit his thesis.

D In considering a recommendation made in terms of clause 3. of sub-condition C of this condition the Committee may specify the period within which the thesis is to be resubmitted.

E Having considered the examiners’ reports the Committee shall recommend to the Professorial Board whether or not the candidate should be admitted to the degree.

1. An application to register for the degree of Master of Science (Biotechnology) shall be made on the prescribed form which shall be lodged with the Registrar at least six weeks before the commencement of the academic year.

2. A An applicant for registration shall hold an approved degree of Bachelor with Honours Class I or Class II in Biological Technology or other relevant discipline.

B An applicant for registration with an approved degree at a standard below Honours Class II may be accepted following satisfactory completion of a qualifying course of not less than one year and examination approved by the Faculty of Biological Sciences.

C In special cases, a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainments as may be approved by the Faculty of Biological Sciences on the recommendation of its Higher Degree Committee.

3. Notwithstanding any other provisions of these conditions, the Faculty of Biological Sciences may require an applicant to demonstrate fitness for registration by carrying out such work and sitting such examinations as the Faculty may determine.

4. A candidate for the degree shall be required to undertake the specified course of advanced study and pass the prescribed examinations. Under the supervision of a member of the academic staff, a candidate shall be required to undertake a specified project, the satisfactory completion of which shall be regarded as part of the examinations.
5. An approved applicant shall register as a student in full-time or part-time attendance at the University.

6. The minimum period of registration before the award of the degree shall be two sessions for full-time students and four sessions for part-time students.

7. An approved candidate shall pay such fees as may be determined by the Council from time to time.

1. The Degree of Master of Science and Society may be awarded at honours or pass level by the Council on the recommendation of the Professorial Board to a candidate who has satisfactorily completed the approved course, comprising at least eight units which normally will be taken over four sessions and, in the case of honours candidates, an additional two session program of advanced study including a dissertation based on research approved by the Higher Degree Committee of the Faculty of Science (hereinafter referred to as ‘the Committee’) on the recommendation of the School of History and Philosophy of Science.

2. A An applicant for registration for the degree shall have been admitted to a degree of Bachelor in the University of New South Wales or other approved university or tertiary education institution of acceptable standing, at a level approved by the Committee. Normally an honours degree or equivalent in science, applied science/technology, a social science or other relevant discipline, or a pass degree together with suitable professional experience would be deemed an appropriate qualification.

B In exceptional cases an applicant may be registered as a candidate for the degree if he submits evidence of such academic and professional attainment as may be approved by the Committee.

C Notwithstanding any other provisions of these conditions the Committee may require an applicant to demonstrate fitness for registration by carrying out such work and sitting for such examinations as it may determine.

3. A An application to register as a candidate for the degree of Master shall be made on the prescribed form which should be lodged with the Registrar at least four (4) weeks before the commencement of the course.

B An approved applicant shall register as a student in part-time attendance at the University.

C No candidate shall be considered for the award of the degree until the lapse of four sessions in the case of a pass candidate or six sessions in the case of an honours candidate.

D The progress of a candidate shall be reviewed annually by the Committee and as a result of such review the Committee may terminate the candidature or take such other action as it considers appropriate.

4. Consequent upon consideration of the candidate’s results in the course assessment, the Committee shall recommend to the Professorial Board whether the candidate may be admitted to the degree.

5. An approved candidate shall pay such fees as may be determined by the Council from time to time.
Master of Statistics (MStats)

1. An application to register for the degree of Master of Statistics shall be made on the prescribed form which shall be lodged with the Registrar at least one full calendar month before the commencement of the session in which the candidate desires to register.

2. A An applicant for registration for the degree 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.

B In special circumstances a person may be permitted to register as a candidate for the degree if he submits evidence of such academic and professional attainments as may be approved by the Faculty on the recommendation of its Higher Degree Committee.

3. Notwithstanding any other provisions of these conditions the Faculty may require an applicant to demonstrate fitness for registration by carrying out such work and sitting for such examinations as Faculty may determine.

4. A candidate for the degree shall be required to undertake the appropriate course of study and pass the prescribed annual examinations. Under the supervision of a member of the academic staff a candidate shall be required to undertake a specified project, the satisfactory completion of which shall be regarded as part of the annual examinations.

5. No candidate shall be considered for the award of the degree until a lapse of four complete sessions from the date of registration, save that in the case of a candidate who obtained the degree of Bachelor with Honours in Statistics this period may, with the approval of the Faculty, be reduced by up to two sessions by exemption from appropriate specified courses of study.

6. An approved applicant shall pay such fees as may be determined from time to time by the Council.

Graduate Diplomas

Graduate Diploma (GradDip)

1. An application for admission to a graduate diploma course shall be made on the prescribed form which should be lodged with the Registrar at least two full calendar months before the commencement of the course.

2. An applicant for admission to a graduate diploma course shall be:

A a graduate of the University of New South Wales or other approved university,

B a person with other qualifications as may be approved by Faculty.

3. Notwithstanding clause 2. above, Faculty may require an applicant to take such other prerequisite or concurrent studies and/or examinations as it may prescribe.

4. Every candidate for a graduate diploma shall be required to undertake the appropriate course of study, to pass any prescribed examinations, and if so laid down in the course, to complete a project or assignment specified by the Head of the School. The format of the report on such project or assignment shall accord with the instructions laid down by the Head of School.

5. An approved applicant shall be required to pay the fee for the course in which he desires to register. Fees shall be paid in advance.
Subject Descriptions and Textbooks

Identification of Subjects by Numbers

Each of the subjects taught in the University is identifiable both by number and by name. This is a fail-safe measure at the points of enrolment and examination against a student nominating a subject other than the one intended. Subject numbers are allocated by the Assistant Registrar, Examinations and Student Records, and the system of allocation is:

1. The School offering a subject is indicated by the number before the decimal point;

2. If a subject is offered by a Department within a School, the first number after the decimal point identifies that Department;

3. The position of a subject in a sequence is indicated by the third number after the decimal point. For example, 2 would indicate that the subject is the second in a sequence of subjects;

4. Graduate subjects are indicated by the suffix G.

As indicated above, a subject number is required to identify each subject in which a student is to be enrolled and for which a result is to be returned. Where students may take electives within a subject, they should desirably be enrolled initially in the particular elective, and the subject numbers allotted should clearly indicate the elective. Where it is not possible for a student to decide on an elective when enrolling or re-enrolling, and separate examinations are to be held in the electives, Schools should provide to the Examinations and Student Record Section in April (Session 1) and August (Session 2) the names of students taking each elective. Details of the actual dates in April and August are set out in the Calendar of Dates earlier in this volume.

Those subjects taught in each Faculty are listed in full in the handbook of that Faculty, together with the subject description and the required textbook list, in the section entitled Subject Descriptions and Textbooks.

The identifying numbers for each School are set out below.

Reference book lists are not published here, but are available from the various Schools.

For General Studies subjects see the Board of Studies in General Education Handbook, which is available free of charge.

Information Key

The following is the key to the information supplied about each subject listed below: 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, ie which session taught not known at time of publication); L (Lecture, followed by hours per week); T (Laboratory/Tutorial, followed by hours per week).

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<td>18 Department of Industrial Engineering</td>
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<td>25 School of Applied Geology*</td>
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<td>26 Department of General Studies*</td>
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<td>27 School of Geography*</td>
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<td>28 School of Marketing</td>
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<td>30 Department of Behavioural Science</td>
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<td>31 School of Optometry</td>
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<td>33 Graduate School of Business</td>
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<td>62 School of History and Philosophy of Science*</td>
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<td>63 School of Social Work</td>
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<td>64 School of German</td>
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<td>65 School of Spanish and Latin American Studies</td>
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<td>66 Subjects Available from Other Universities</td>
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<td>68 Board of Studies in Science and Mathematics</td>
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<td>85 Australian Graduate School of Management</td>
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<td>90 Faculty of Law</td>
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<td>97 Division of Postgraduate Extension Studies</td>
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* Subjects also offered for courses in this handbook.
Physics

Undergraduate Study

Physics Level I Units

1.001 Physics I F L3T3

Prerequisite: HSC Exam Grade Required
2 unit Mathematics or 1 or 2
3 unit Mathematics or 1, 2 or 3
4 unit Mathematics and 1, 2, 3, 4 or 5 (Grade 5 at a standard acceptable to the Professorial Board)
2 unit Science (incl. Physics and /or Chem.) 1, 2 or 3
or
4 unit Science (incl. Physics and/or Chem.) 1, 2 or 3

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.

A molecular approach to energy transfer, kinetic theory, gas laws and calorimetry. 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. Interaction of radiation with matter, photoelectric effect, Compton effect, spectroscopy. Resolution of the wave particle paradox by means of wave mechanics and the uncertainty principle.

Textbook
Weidner R. T. & Sells R. L. Elementary Physics, Classical and Modern Allyn & Bacon

1.011 Higher Physics I F L3T3

For students of all Faculties except Medicine and Architecture who have a good secondary school record and who wish to do a more challenging course.

As for 1.001 with additional topics: space physics, mechanical properties of real materials, rotational dynamics, physics of biological systems, AC and charged particle dynamics, physics of energy resources and conversion.

Textbooks
Russell G. J. & Mann K. Alternating Current Circuit Theory NSWUP
Weidner R. T. & Sells R. L. Elementary Physics, Classical and Modern Allyn & Bacon

Physics Level II Units

1.012 Mechanics and Thermal Physics S1 L3T2

Prerequisites: 1.001 or 1.011, 10.001. Co-requisite: 10.211A. Excluded: 1.112C, 1.122C.

Properties of solids and liquids, elasticity, hydrostatics, hydrodynamics, damped and forced vibrations, resonance, coupled systems, normal modes, Fourier analysis, waves, group velocity, reflection and transmission at a boundary.

Kinetic theory, Maxwell velocity distribution, transport coefficients, first and second laws of thermodynamics, thermodynamic functions, simple applications, microscopic approach to thermodynamics, Boltzmann probability.

Additional material is studied for the award of Distinction/High Distinction.

Textbooks
French A. P. Vibrations and Waves Nelson
Mandl F. Statistical Physics Wiley

1.022 Electromagnetism and Modern Physics S2 L3T2


Electrostatics in vacuum and in dielectrics, Gauss’ law, current density, magnetostatics in vacuum and in magnetic materials, electromagnetic induction, displacement current, Maxwell’s equations, simple solutions, applications.

Special theory of relativity, Lorentz transformation, simultaneity relativistic mass, momentum and energy, formalism of wave mechanics, Schrodinger’s equation, simple solutions, hydrogen atom, spectra, electron spin, selection rules, exclusion principle, Zeeman effect, molecules.

Additional material is studied for the award of Distinction/High Distinction.

Textbooks
Armstrong R. L. & King J. D. The Electromagnetic Interaction Prentice-Hall
Arya A. P. Elementary Modern Physics Addison-Wesley

For students intending to proceed to Level III physics:

Arya A. P. Fundamentals of Atomic Physics Allyn & Bacon

1.032 Laboratory F T3

Prerequisites: 1.001 or 1.011, 10.001. Excluded: 1.112A, 1.122A, 1.112B, 1.122B, 1.212B, 1.922.

Alternating current circuits, complex impedance, resonance, mutual inductance, introductory electronics, diode 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.

Textbooks
No set texts.

1.112A Electromagnetism S2 L2½T3½
Not available to students unless completing a set of Physics Level II units. For details of arrangements consult School of Physics.

Electrostatics in vacuum and in dielectrics. Magnetostatics in vacuum and in magnetic materials. Maxwell's equations and simple applications.

Textbook
Armstrong R. L. & King J. D. The Electromagnetic Interaction Prentice-Hall

1.112B Modern Physics S1 L2½T3½
Not available to students unless completing a set of Physics Level II units. For details of arrangements consult the School of Physics.

Special theory of relativity, Lorentz transformation, relativistic mass momentum and energy. Schrödinger wave equation expectation values, operators, eigenfunctions, eigenvalues, free-particle, bound-particle and applications to physical systems, spectra, electron spin, spin-orbit coupling, exclusion principle, origins and spectra of X-rays, electron energy levels in solids.

Textbook
Arya A. P. Elementary Modern Physics Addison-Wesley

Terminating Physics Level II Units

1.912 Geometrical Optics S1 L1T2
Prerequisites: 1.001 or 1.011, 10.001 or 10.011 or 10.021. Excluded: 1.212A, 31.211, 31.182.


Textbook
Fincham W. H. A & Freeman M. H. Optics 8th ed Butterworths

1.922 Electronics S1 L1T2
Prerequisites: 1.001 or 1.011, 10.001 or 10.011 or 10.021. Excluded: 1.212B, 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.

Textbook
Smith R. J. Circuits, Devices and Systems 2nd ed Wiley

1.932 Introduction to Solids S2 L2T1
Prerequisites: 1.001 or 1.011, 10.001 or 10.011 or 10.021. Excluded: 1.022, 1.212C.

Introductory quantum mechanics and atomic physics; crystal structure; point and line defects; introductory band theory; conductors, semiconductor and insulators; energy level diagrams.

Textbook

Physics Level III Units

1.013 Quantum Mechanics and Nuclear Physics F L1½T½
Prerequisites: 1.012, 1.022, 10.211A. Excluded: 1.113A, 1.123A, 1.123D, 2.023A, 10.222F.

Concepts and formulation, expectation values and measurement, steps, wells, and barriers, tunnelling, harmonic oscillator, perturbation theory, hydrogen atom, angular momentum operators, spin and spin orbit coupling, vector model, fine structure, identical particles, helium atom, spectroscopy, electron states in molecules and solids.

Detecting instruments for nuclear particles, counting statistics, Rutherford scattering, radioactivity, radiative processes, reactions, optical model, parity, introduction to particle physics, mesons, baryons, quarks.

Additional material is studied for the award of Distinction/High Distinction.

Textbook
White R. P. Basic Quantum Mechanics McGraw-Hill

1.023 Statistical Mechanics and Solid State Physics S1 L3T1
Prerequisites: 1.012, 1.022, 10.211A. Co-requisite: 1.013. Excluded: 1.113C, 1.123B, 1.123C.

Canonical distribution, paramagnetism, Einstein solid, ideal gas, equipartition, grand canonical ensemble, chemical potential, phase equilibria, Fermi and Bose statistics, blackbody radiation. Crystal structure, bonding, diffraction, lattice vibrations, phonons, free-electron models of metals, band theory, point defects, dislocations.
Additional material is studied for the award of Distinction/High Distinction.

Textbooks
Mandl F. Statistical Physics Wiley
Blakemore J. S. Solid State Physics Saunders

1.033 Electromagnetism and Optical Physics S2 L3T1
Prerequisites: 1.012, 1.022, 10.211A. Excluded: 1.113B, 1.123B, 10.222C.

Wave equation, reflection and transmission at dielectric, metallic and plasma interfaces, Fresnel equations, skin depth, waveguides and cavities, radiation fields, dipole and long antenna.

Fourier theory, diffraction from rectangular and circular apertures, interference and interferometry, coherence, image formation, resolution, holography, Fourier transform spectroscopy.

Additional material is studied for the award of Distinction/High Distinction.

Textbook
Hecht E. & Zajac A. Optics Addison-Wesley.

1.043 Experimental Physics F T6
Prerequisites: 1.012, 1.022, 1.032. Excluded: 1.113A, 1.113B, 1.113C, 1.113D, 1.123A, 1.123B, 1.123C, 1.123D.

A course of instruction in modern experimental techniques, methods of experimental design and analysis of results. Experiments, which will in the main consist of small open-ended projects, will be available in many areas of physics including electromagnetic waves, solid state physics, nuclear physics, atomic physics and spectroscopy, optical and laser physics, vacuum systems.

Textbooks
No set texts.

1.133 Electronics S1 L2T4
Prerequisite: 1.922 or 1.032. Excluded: 1.143B.


Textbook
Benedict R. R. Electronics for Scientists and Engineers 2nd ed Prentice-Hall

1.143 Biophysics S1 L2T1
Prerequisites: 1.012, 1.022. Excluded: 1.143A.

Thermodynamics in Biology, Electrochemical potentials, Donnan equilibrium, irreversible processes, diffusion and applications to biological systems.

Membrane potentials, Nernst potential, Goldman and Nernst-Planck equation, generalized approach.

Active transport. Membrane structure. The nerve impulse, activation and inactivation, Hodgkin and Huxley equations.


Textbooks
No set texts.

1.153 Biophysical Techniques S2 L2T1
Prerequisites: 1.012, 1.022, 1.032. Excluded: 1.143A.

The 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.

Textbooks
No set texts.

1.163 Astrophysics S1 L1½T½
Prerequisite: 1.022. Excluded: 1.113D.


Textbook
Taylor R. J. The Stars — Their Structure and Evolution Wykeham Science Series

1.173 Conceptual Framework of Physics S2 L2T1
Prerequisites: 1.012, 1.022. Co-requisites: 1.013, 1.023. Excluded: 1.143D.

Physics and metaphysics, the place of speculation in theory formation.
Space and time, coordinate systems, nature of time. Fundamental physical phenomena, electrical, gravitational, inertial, nuclear phenomena, entropy and probability.

Field theory, formulation, action at a distance, propagation, energy. Relativity, postulates, simultaneity, limiting speeds, mass energy. Relationship between micro and macrocosmos, statistics, entropy and information, arrow of time.

Matter and anti-matter and energy, conservation laws, inertial mass, field energy.

Quantum processes, granularity, measurements and uncertainty principle, determinism versus indeterminism, nuclear phenomena.

Textbooks
No set texts.

1.313
Physics of Materials S2 L2T4 or F L1 T2
Prerequisite: 1.023. Excluded: 31.113A.

Textbooks
Adler R. B. Smith A. C. & Longine R. L. Introduction to Semiconductor Physics Wiley

1.323
Physics of Measurement S1 L2T4
Prerequisite: 1.032. Excluded: 31.113B.

Textbooks
Blatt J. M. Introduction to Fortran IV Programming Goodyear

1.333
Applications of Radiation S2 L2T4
Co-requisite: 1.033. Excluded: 31.113C.
The present and potential uses of electro-magnetic radiation over the whole spectrum are studied. Applications of acoustic radiation, Microscopy, interferometry and optical spectroscopy. Applications of thermal radiation, microwaves, radio waves, polarized light and lasers. Holography. X-ray spectroscopy, diffractometry and radiography. Special radiation sources and detectors.

Textbook
Kinsler L. E. & Frey A. R. Fundamentals of Acoustics 2nd ed Wiley or
Tucker D. G. & Gazey B. K. Applied Underwater Acoustics Pergamon

1.513
Plasma and Laser Physics S2 L3T1
Prerequisites: 1.012, 1.022.
Experimental and theoretical problems in plasma physics. Plasma waves, magnetohydrodynamics, magnetic confinement of plasmas for nuclear fusion, laboratory, extraterrestrial and chemical plasmas. Theory of lasers; lasers of various types and properties. Interaction of high intensity lasers with plasmas; experiments and theory of plasma properties and nonlinear effects, absorption, self-focusing. Laser compressed nuclear reaction plasmas, relativistic effects, pair production.

Textbooks
No set texts.

1.523
Relativity and Electromagnetism S1 L3T1
Prerequisites: 1.012, 1.022, 10.211A, 10.111A, 10.111B.

Textbooks
No set texts.

1.913
Marine Acoustic and Seismic Methods (Oceanography Unit) F L2T1
Component given by School of Physics (S1):

Component given by School of Applied Geology (S2):

Textbook
Kinsler L. E. & Frey A. R. Fundamentals of Acoustics 2nd ed Wiley or
Tucker D. G. & Gazey B. K. Applied Underwater Acoustics Pergamon
1.113A
Wave Mechanics†
Concepts and formulation, finite wells and barriers, tunneling, harmonic oscillator and applications, hydrogen atom, perturbations, systems of identical particles, electron states in complex systems, bonding, molecules, periodic solids.

Textbooks
No set texts.

1.113D
Astrophysics and Nuclear Physics†
The observational environment, optical astronomy, radio astronomy, X-ray astronomy, stellar evolution, radio sources, the sun.

Detecting instruments and accelerators for nuclear particles, Rutherford scattering, nuclear atom, neutrino, radioactive processes, nuclear reactions, angular distributions, mesons, baryons, excited nuclear states.

Textbook

Higher Physics Level III Units

1.123A
Quantum Mechanics†

Textbook
Gasiorek S. Quantum Physics Wiley

1.123B
Electromagnetic Theory and Statistical Mechanics†
Metallic boundary conditions, eigenfunctions and eigenvalues, cavities, wave guides, scattering by a conductor, wave equation for potentials, radiation fields, Hertz potential, dipole and multi-pole radiation, radiated energy and angular momentum.

Statistical mechanics: Kinetic theory, the Boltzmann equation, Maxwell-Boltzmann distribution, Boltzmann's H-theorem; classical statistical mechanics: postulates, equipartition, ensembles, difficulties; quantum statistical mechanics; postulates, ensembles, Fermi and Bose statistics.

Textbooks
Lorrain P. & Corson D. Electromagnetic Fields and Waves 2nd ed Freeman
Reif F. Fundamentals of Statistical and Thermal Physics McGraw-Hill

1.123C
Solid State and Nuclear Physics†
Crystallography, binding energy, phonons, lattice conduction, free electron gas, band theory.

Nuclear models, binding energy, nuclear forces, elementary particles, nuclear reactions, radioactive decay.

Textbooks
Burcham W. E. Nuclear Physics, an Introduction Longman
Kittel C. Introduction to Solid State Physics 4th ed Wiley

1.123D
Atomic Physics and Spectroscopy†
Collision parameters, transport coefficients, potential functions, atomic collisions, scattering of heavy particles, scattering of electrons, avalanche formation, recombination, radiation processes, stimulated emission, detectors.

Spectrum of hydrogen, fine structure, electron spin, vector treatment of spectroscopy, emission and absorption of radiation, diatomic molecules.

Textbook
McDaniel E. W. Collision Processes in Ionised Gases Wiley

1.104
Physics IV (Honours)
Comprises the units 1.114, 1.124, 1.134, 1.144, 1.154. Students doing the normal honours course should enrol in the single subject 1.104 only. Students taking only a part of the honours course should enrol in the desired unit numbers.

1.114
Quantum Mechanics
Time dependent perturbation theory, semi-classical radiation theory, selection rules. Relativistic wave equations, Dirac equation, spin, the hydrogen atom, negative energy solutions. Scattering theory, Born approximation, partial waves, phase shifts, optical theorem, resonances, scattering matrix, inelastic scattering, distorted wave and close coupling approximations.

Textbooks
No set texts.

1.124
Statistical Mechanics
Basic theory, fluctuations, quantum gases, equations of state for bosons and fermions. Bose condensation, quantum mechanical ensemble theory, density matrix, classical cluster expansion, virial

† Not available to students unless completing a set of Physics Level III units. For details of arrangements consult the School of Physics.

Textbook
Pathria R. K. *Statistical Mechanics* Pergamon

1.134
**Solid State Physics**  
**F L1T0**
Bond theory of solids, NFE and tight binding approximations, electron and hole dynamics, Fermi surface studies, theory of semiconductors, impurity statistics, transport properties.

Magnetism, ionic moments, crystal field effects, Stevens operations, quenching, molecular field theory, Curie-Weiss law, exchange in metals and insulators, domains, magnetic bubbles, applications.

Textbooks
Kittel C. *Introduction to Solid State Physics* Wiley
Morrish A. H. *The Physical Principles of Magnetism* Wiley

1.144
**Atomic Physics and Nuclear Physics**  
**S2 L2T0**
Simple spectra fine structure, Zeeman effect. Complex Spectra—electrostatic and magnetic interactions, multiplets, coupling schemes, X-ray spectra—structure of X-ray levels, X-ray line spectra. Configuration interaction.

2 nucleon systems, deuteron, (np) and (pp) scattering, complex nuclei, nuclear reactions, Breit-Wigner theory, optical model, theory of α, β decay.

Textbooks
To be advised.

1.154
**Projects**  
**F**

1.304
**Applied Physics IV (Honours)**
Comprises the units 1.314, 1.324, 1.334, 1.344, 1.354. Students doing the normal honours course should enrol in the single subject 1.304 only. Students taking only part of the honours course should enrol in the desired unit numbers.

1.314
**Advanced Physics of Materials**  
**S1 L2T4**
An advanced subject on the relation of structure of materials to their physical properties.


Textbooks
No set texts.

1.324
**Advanced Physical Instruments**  
**S1 L1T5**
The basic principles, the techniques employed, and the modes of operation of advanced physical instruments in the following fields: electron beam examination, spectroscopic analysis, chromatography, thermal analysis and mechanical testing.

Textbooks
No set texts.

1.334
**Introduction to Industrial Practice**  
**F L1T2**
Lectures, each followed by a tutorial discussion covering: patents and the scientist; applied physics in electric power engineering; the emergence of electronic technology in Australia; reliability engineering in industry; sources of information for Australian industry; industrial technical reporting; operations research, systems research and budgeting of resources; the work of a physicist in the electronics industry; quality assurance; functions of an applications laboratory; economics of industrial R&D; critical-path analysis and network planning; the physicist in the mining industry.

Textbooks
No set texts.

1.344
**Special Studies**
Consult the Department of Applied Physics for details.

1.354
**Projects**  
**F**

1.504
**Theoretical Physics IV (Honours)**
Comprises the units 1.114, 1.124, 1.544 and two of 1.134, 1.144, 1.514, 1.524, 1.534. Students doing the normal honours course should enrol in the single subject 1.504 only. Students taking only part of the honours course should enrol in the desired unit numbers.
1.514 
Plasma Theory S1 L2

Textbooks
No set texts.

1.524 
Waves in Continuous Media S2 L2

Textbooks
No set texts.

1.534 
Quantum Theory of Solids S2 L2

Textbook
Harrison W. A. Solid State Theory McGraw-Hill

1.544 
Projects F

Graduate Study
Not all graduate subjects are necessarily offered in any one year.

1.115G 
Critical Literature Review
For MPhysics students.

1.125G 
Research Project
For MPhysics students.

1.135G 
Atomic Physics
For MPhysics students.
Ionization of gases, electron scattering, impact ionization, ion sources, atomic spectroscopy.

1.145G 
Biophysics
For MPhysics students.
NMR studies of ions in living systems; thermodynamics of irreversible processes applied to ion accumulation and membrane potentials, electrical properties of membranes, nerve excitation, feedback systems in man.

1.155G 
Crystallography
For MPhysics students.
Diffraction and lattice dynamics, improved methods of structure determination, X-ray and neutron diffraction.

1.165G 
Solid State Transport
For MPhysics students.
Thermogalvanomagnetic effects in semiconductors, lattice conductivity, high field transport in insulators, electrical breakdown, effects of defects and dislocations on diffusion.

1.175G 
Magnetic Materials
For MPhysics students.
Ferromagnetic properties of rare-earth and transition-metal alloys, high field magnetization, electron spin resonance, magnetic properties of transition-metal oxides, phase transitions, magnetic minerals.

1.185G 
Surface Physics
For MPhysics students.
Surface properties of semiconductors and metals, low-and-high energy electron diffraction from surfaces; EPR and Auger spectroscopy applied to surfaces, surface melting, surface barriers.

1.195G 
Materials Irradiation
For MPhysics students.
Interaction of energetic charged particles and photons with solids, channelling, blocking and sputtering phenomena, radiation damage, strength of solids, fracture propagation.
1.105G
Acoustics
For MPhysics students.
Acoustic waves in solids. Effects of radiation-induced defects on ultrasonic propagation, internal friction, acoustic spectroscopy, propagation in heterogeneous media, transients.

1.917G
Vibration and Wave Theory I
For MSc(Acoustics) students.
Simple oscillator, damped oscillator, ordinary differential equations, complex numbers, forced vibrations and resonance, coupled oscillators. Plane waves, interference and diffraction.

1.927G
Acoustic Theory
For MSc(Acoustics) students.
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.

1.947G
Advanced Physical Acoustics (Elective)
For MSc(Acoustics) students.
Vibrating systems; coupled oscillators, beams, membranes, plates, resonators, acoustic filters; analogs, analogue computer simulation of vibrating systems; transfer of energy from one system to another. Reflection and transmission at walls, rigid walls, flexible walls, multiple walls, impulsive excitation. Sound absorbers; porous absorbers, perforated panel absorbers, sonic and ultrasonic measurement techniques, relation to properties of materials.

1.937G
Acoustic Measuring Systems
For MSc(Acoustics) students.
Microphones, amplifiers, loudspeakers, filters, recorders, pick-ups, noise generators. Acoustic measuring instruments.

1.957G
Acoustic Laboratory and Analysis
For MSc(Acoustics) students.
Practical experiments related to the subject matter of 1.927G Acoustic Theory.
Theory and practice of digital methods of analysis in the time and frequency domains.

1.967G
Vibration and Wave Theory II
For MSc(Acoustics) students.
Fourier analysis, guided waves, electrical analogs, analysis of networks. Statistical distributions, probability, noise, correlation, sampling and digital procedures.

1.977G
Electro-Acoustics
For MSc(Acoustics) students.
Sound reinforcement systems; ambiphony; assisted resonance. Special requirements for translation; language laboratories.

1.118G
Methods of Theoretical Physics
For PhD, MSc and MPhysics students.
Part 2. Symmetry and group theory.
Part 3. Many particle systems.
Part 4. Tensor calculus and variational techniques.

1.128G
Methods of Experimental Physics
For PhD, MSc and MPhysics students.
Part 1. General Methods: Signal processing, characterization of specimens, vacuum, high temperatures, low temperatures.
Not all these topics are covered in any one year.

1.119G
Basic Solid State Physics
For GradDip in Current Science students.
1.129G
Solid State Device Physics  S2 L2T0
For GradDip in Current Science students.


1.329G
Physics of Strong Materials  SS L1T2
For GradDip in Current Science students.

Revision of bonding and structures in crystalline and non-crystalline solids; elastic and plastic properties. Ideal and real strength of solids; cracks in brittle and ductile materials. Strengthening of metallic and polymeric materials. Natural and synthetic fibrous composites and aggregates.

1.139G
Biophysics  S2 L2T1
For GradDip in Current Science students.


1.149G
Physical and Applied Acoustics  S1 L2T1
For GradDip in Current Science students.

Physical acoustics: ultrasonic measurement techniques, resonance methods, pulse-echo methods, optical diffraction and Brillouin scattering methods. Ultrasonic waves in solids, determination of elastic constants, internal friction due to viscoelastic and thermoelastic effects, dislocation damping, effects of deformation and radiation, acoustic emission, ultrasonic holography. Surface waves on crystals, propagation conditions, generation and detection, acoustic amplification in piezoelectric semiconductors. Sound waves and their properties, subjective acoustics, auditory response, audiology and deafness, articulation and intelligibility, loudness, speech and interference, critical band marking, damage risk criteria, impulsive noise conservation and compensation. Noise reduction: measurement and analysis, noise sources and their characteristics, material and systems—absorption and transmission loss, room acoustics, barriers and enclosures, noise control.

1.319G
Measurement and Data-handling  SS L1T2
For GradDip in Current Science students.

Electrical measurement techniques, ranging from DC to UHF. Transducers for conversion of measures of various physical quantities to electrical form. Noise in circuits. Digital instruments. Errors of observation and their treatment by statistical methods, using computers and desk calculators. Problems of measurement under adverse conditions.

Chemistry

Students wishing to take 8 or more Level III Chemistry units are required to transfer to the Pure and Applied Chemistry Course (391) before the commencement of Year 2. If Year 2 studied in the Science and Mathematics course is similar to Year 2 of Course 391, the transfer may still be made before the commencement of Year 3.

The Pure and Applied Chemistry Course which enables specialization in Chemistry is described in detail earlier in this handbook.

Undergraduate Study

2.111
Introductory Chemistry†  S1 L2T4

Textbooks

Aylward G. A. & Findlay T. J. V. SI Chemical Data Wiley
Labaratory Manual, Chemistry 2.111, 2.121 and 2.131 UNSW
Mahan B. H. University Chemistry 3rd ed Addison-Wesley

† Students who have passed 2.121 may not subsequently enrol in 2.111.
2.121 Chemistry IA
S1 or S2 L2T4

Prerequisites: 2.111 or 2.121.


Textbooks
As for 2.111 Introductory Chemistry.

2.131 Chemistry IB
S1 or S2 L2T4

Prerequisites: 2.111 or 2.121.

The rate of a chemical change and chemical kinetics, catalysis, order and molecularity, activation energy, the Arrhenius Equation, reaction mechanism. Electronic structure of atoms in terms of the quantum mechanical model. Structure of the Periodic Table and its relationship to electronic configuration. Chemical bonding, hybridization, molecular shape, multiple bonding, bond polarity, intermolecular forces. Properties of compounds of selected elements, acid-base character of oxides and hydroxy compounds, relative stability of oxidation states. Chemistry of carbon compounds, stereoisomerism reactions of aliphatic and aromatic hydrocarbons, alcohols, phenols, ethers, aldehydes, ketones, carboxylic acids and their derivatives, esters, acyl halides, anhydrides, amides, amines.

Textbooks
As for 2.111 Introductory Chemistry.


2.002A Physical Chemistry
L3T3

Prerequisites: 2.121 and 10.011 or 10.001 or 10.021.

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.

Textbooks
Barrow G. M. Physical Chemistry 3rd ed McGraw-Hill
Shaw D. J. Introduction to Colloid and Surface Chemistry 2nd ed Butterworths

2.002B Organic Chemistry
L3T3

Prerequisite: 2.131

Chemistry of the more important functional groups; aliphatic hydrocarbons, monocyclic aromatic hydrocarbons, halides, alcohols, phenols, aldehydes, ketones, ethers, carboxylic acids and their derivatives, nitro compounds, amines and sulphonic acids.

Textbooks

Solomons T. W. G. Organic Chemistry Wiley Int Ed

Only if proceeding to further study of Organic Chemistry:
Vogel A. I. Elementary Practical Organic Chemistry Pt II Qualitative Organic Analysis Longman

2.002D Analytical Chemistry
L2T4

Prerequisites: 2.121, 2.131. 10.001, 10.011 or 10.021.


Textbooks
Ewing G. W. Instrumental Methods of Chemical Analysis 4th ed McGraw-Hill
Peters D. G., Hayes J. M. & Hiettje G. M. Chemical Separations and Measurements Saunders

2.042C Inorganic Chemistry
L2T4

Prerequisites: 2.121, 2.131.

Chemistry of the non-metals including B, C, Si, N, P, S, Se, Te, halogens, and noble gases. Chemistry of the metals of groups IA, IIA, and AI. Typical ionic, giant-molecule and close-packed structures. Transition metal chemistry, including variable oxidation states, paramagnetism, Werner's theory, isomerism of six- and four-coordinate complexes, chelation, stabilization of valency states. Physical methods of molecular structure determination. Chemistry of Fe, Co, Ni, Cu, Ag, Au.

Textbook
Cotton F. A. & Wilkinson G. Basic Inorganic Chemistry Wiley
2.003E  
**Nuclear and Radiation Chemistry**  
L2T4  
*Prerequisites:* 2.121, 2.131 and 10.001, 10.011 or 10.021.  
*Textbooks*  
Carswell D. J. *Introduction to Nuclear Chemistry* Elsevier  
Friedlander G., Kennedy J. J. & Miller J. M. *Nuclear and Radiochemistry* 2nd ed Wiley  
or  
Harvey B. *Introduction to Nuclear Physics and Chemistry* Prentice-Hall  

2.003H  
**Molecular Spectroscopy and Structure**  
S2 L3T3  
*Prerequisite:* 2.121, 2.131.  
Absorption and emission of radiation. Atomic spectra. Molecular spectroscopy: vibrational, including infrared and Raman; UV-visible; instrumentation and sample handling. Magnetic resonance. Mass spectrometry with particular reference to structure determination. Laboratory and tutorial work to illustrate the above, including inspection of major instruments.  
*Textbook*  

2.003J  
**Fundamentals of Biological Chemistry**  
L2T4  
*Prerequisites:* 2.121, 2.131. Excluded: 41.101.  
Aspects of the chemical and physical properties of materials important in biological systems. Methods of separation, 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, pK 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.  

Trace elements in biological systems. Chemistry of common heterocyclic systems with emphasis on molecules of biological importance.  
*Textbooks*  
Acheson R. M. *Introduction to the Chemistry of Heterocyclic Compounds* Interscience  
Barker R. *Organic Chemistry of Biological Compounds* Prentice-Hall  

2.003K  
**Solid State Chemistry**  
L2T4  
*Prerequisites:* 2.121, 2.131 and 10.001 or 10.011.  
The determination of crystal structures by single crystal diffraction: X-ray and neutron diffraction methods. Practical and automated aspects of the solution of crystal structures: applications to inorganic, molecular and macromolecular crystals. Patterns of solid state structure: the structures of crystals with unusual and valuable chemical and physical properties. Solid state reactions, surface properties and catalysis. Applications of EPR, NMR and mass spectrometry.  
*Textbooks*  
Bond G. C. *Catalysis by Metals* Academic  
Greenwood N. N. *Ionic Crystals, Lattice Defects and Non-stoichiometry* Butterworths  
Stout G. H. & Jensen L. H. *X-Ray Structure Determination* Macmillan  

2.013A  
**Introductory Quantum Chemistry**  
L2T4  
*Prerequisites:* 1.001 or 1.011, 2.121, 2.131 and 10.001, 10.011 or 10.021.  
*Textbooks*  
Barrow G. M. *Physical Chemistry* 3rd ed McGraw-Hill  
Dixon R. N. *Spectroscopy and Structure* Methuen  

2.003A  
**Physical Chemistry**  
L3T3  
*Prerequisite:* 2.002A.  
Thermodynamics, including non-ideal systems; advanced electrochemistry; statistical thermodynamics; applications to gases, liquids and chemical equilibria; states of matter.  
*Textbook*  
Barrow G. M. *Physical Chemistry* 3rd ed McGraw-Hill
2.003B
**Organic Chemistry**  
**L2T4**

*Prerequisite: 2.002B*

**Alicyclic 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.

**Heterocyclic Chemistry.** Synthesis and reactions of the following heteroaromatic systems: pyridine, quinoline, isoquinoline. Flavones and isoflavones; pyrimidine, pyrrole, furan, thiophene, indole, imidazole.

**Textbooks**  
or  
Roberts J. D. & Caserio M. C. *Basic Principles of Organic Chemistry* Benjamin  
Joule J. A. & Smith G. F. *Heterocyclic Chemistry* Van Nostrand Reinhold  
McQuilkin F. J. *Alicyclic Chemistry* CUP  
Vogel A. I. *Elementary Practical Organic Chemistry* Pt II Qualitative Organic Analysis Longman  
Whittaker D. *Sterechemistry and Mechanism* Clarendon

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2.003C
**Inorganic Chemistry**  
**L2T4**

*Prerequisite: 2.042C.*

Coordination chemistry: valence bond and crystal bond and crystal field theory and their application to magnetic and spectral properties of complexes. Factors affecting the stability of complexes; unusual oxidation states of transition metals. Chemistry of the groups IIIA (the lanthanides and actinides), VIA, VA, VIA and VIIA. More advanced chemistry of groups IIIB, IVB, VB, VIIIB and VIIIB and the noble gases.

**Textbook**  

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2.003D
**Instrumental Analysis**  
**L2T4**

*Prerequisites: 2.002A and 2.002D.*

Selected spectrophotometric methods of analysis: infrared, emission, flame, precision spectroscopy, spectrofluorimetry, X-ray fluorescence, mass spectroscopy, instrumental chromatography, thermal analysis. Electrochemical and kinetic methods. Introduction to automation and data processing.

**Textbook**  

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2.003L
**Applied Organic Chemistry**  
**L1T2**

*Prerequisite: 2.002B. Excluded: 2.033L.*

Discussion at advanced level of the chemistry of selected commercially important groups of organic materials. Mechanisms of reaction and physical properties, together with methods of examination, in overall unit approach, correlating structure with behaviour. Emphasis on breakdown to model systems.

Theory of physical techniques, refractometry, polarimetry etc. from basis of additivity. Fatty acids with emphasis on unsaturation, thermal and oxidative polymerizations, alkyl resins, analysis of mixtures. Waxes and steroids, selected natural and synthetic macromolecules; polymerization processes, including treatment of initiators, chain transfer agents, retarders. Vulcanization and sulphur-olefin reactions. Photochemical processes; electro-organic chemistry. Fine chemicals, soaps and detergents. Aspects of metal catalysis in industry.

**Textbooks**  
No set texts. A list of reference books is provided by the School.

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2.003M
**Organometallic Chemistry**  
**L2T4**

*Prerequisite: 2.002B.*

Synthesis, structure and reactions of metal alkyls and aryls; metal carbonyls, isonitriles and acetylides; compounds of metals with unsaturated hydrocarbons; organic chemistry of boron, silicon, phosphorus and arsenic; application of organometallic compounds in organic synthesis and homogeneous catalysis.

**Textbooks**  
Pauson P. *Organometallic Chemistry* Arnold  
Swan J. M. & Black D. St. C. *Organometallics in Organic Synthesis* Chapman & Hall

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2.013B
**Synthetic Organic Chemistry**  
**L2T4**

*Prerequisite: 2.003B.*


**Textbook**  
Carruthers W. *Some Modern Methods of Organic Syntheses* CUP

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2.013C
**Advanced Inorganic Chemistry**  
**L2T4**

*Prerequisite: 2.042C. Co-requisite: 2.003C.*

Synthesis, structure and reactions of metal alkyls and aryls; metal carbonyls, isonitriles and acetylides; compounds of metals with unsaturated hydrocarbons; organic chemistry of boron, silicon, phosphorus and arsenic; application of organometallic compounds in organic synthesis and homogeneous catalysis.

**Textbooks**  
Pauson P. *Organometallic Chemistry* Arnold  
Swan J. M. & Black D. St. C. *Organometallics in Organic Synthesis* Chapman & Hall
Reaction mechanisms involving metal complexes. Spectroscopic methods for investigating metal complexes, including infrared, electronic, and Mossbauer spectroscopy. Inorganic crystal chemistry: structures and properties of simple compounds. Cluster compounds, metal-metal bonding, extended electronic interactions. π-Complexes, carbonyls, nitrosyls, ethylene complexes, and sandwich-type compounds; methods of preparation, reactions, evidence for structures and type of bonding involved.

Textbook

2.013D
Advanced Analytical Chemistry L2T4
Prerequisite: 2.002D. Co-requisite: 2.003D.


Textbooks
Ewing G. W. Instrumental Methods of Chemical Analysis 4th ed McGraw-Hill
Kolthoff I. M., Sandell E. B., Meehan E. J. & Bruckenstein S. Quantitative Chemical Analysis Macmillan

2.013L
Chemistry and Enzymology of Foods L1T2
Prerequisite: 2.002B. Excluded: 2.043L, 2.023L, 2.053L.

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.

Textbooks
No set texts. A list of reference books is provided by the School.

2.013M
Thermochemistry L2T4
Prerequisite: 2.002A.

Thermochemistry of metal complex and organometallic reactions: Dissociation of molecules and bond energies; solvation of ions and molecules; reactions in non-aqueous solution; substitution reactions, Lewis acid-base reactions; formation of inorganic polymers, energy-induced reactions; mechanism of inorganic substitution, electron-transfer and free-radical reactions; reactions of coordinated ligands; template synthesis, porphyrin complexes.

Textbook

2.023A
Chemical Physics L4T1
Prerequisites: 2.002A, 10.211A.

Wave mechanics — linear operators; Schrödinger wave equation, applications, methods of solution, variation principle, linear combinations, perturbation theory. Many-electron problems — central field method; electron spin; Fermi-Dirac statistics; angular momentum operators; Coulomb repulsion two-electron operator; spin-orbit coupling; Russell-Saunders and jj coupling; Zeeman effect; vector coupling and Wigner coefficients; allowed transitions. Group theory — symmetry operations; matrix representation; irreducible representation; characters of a group; non-rigid molecules; antisymmetry operators.

Textbook
Golding R. M. Applied Wave Mechanics Van Nostrand

2.023B
Natural Product Chemistry L2T4
Prerequisite: 2.003B.

The isolation, structure determination, synthesis and biosynthesis, and the reactions of selected classes of organic compounds of biological significance. The chemistry of plant and animal products — terrestrial and marine. Examples from carbohydrates, terpenoids and steroids, alkaloids and other naturally-occurring heterocyclic systems. Interdisciplinary aspects of the topic.

Textbook

2.023L
Biological and Agricultural Chemistry L1T2
Prerequisite: 2.002B. Excluded: 2.053L, 2.013L, 2.043L.


Textbooks
No set texts. A list of reference books is provided by the School.
2.033A 
**Physical Chemistry of Macromolecules** L2T4

*Prerequisites:* 1.012 or 2.002A and 2.002B or 2.003J.

Macromolecules in solution; determination of molecular size; gel permeation chromatography, diffusion, sedimentation, viscometry, osmometry and light scattering. Spectroscopic properties: circular dichroism and optical rotary dispersion; conformation of macromolecules in solution; helix-random coil transitions. Macromolecules in the solid state; X-ray diffraction; basic structural features.

**Textbook**
Van Holde K. E. *Physical Biochemistry* Prentice-Hall

2.033L
**Applied Organic Chemistry‡** F L2T4

*Prerequisite:* 2.002B. Excluded: 2.003L.

As for 2.003L but in greater detail and depth.

**Textbooks**
No set texts. A list of reference books is provided by the School.

2.043A
**Environmental Chemistry** L3T3

*Prerequisites:* 2.002A, 2.002D.


*plus*

*either*:
Simple digital and analogue computer models of ecological systems based on chemical data and physico-chemical properties.

*or*
Distribution of elements and nutrient cycles in water; organic carbon cycles, oxygen balance (redox processes in aquatic systems). Chemical models of these processes (including an introduction to simple computing). Practical project (mostly field work) dealing with nutrient cycles.

**Textbooks**
Hamilton C. H. *Chemistry in the Environment* Freeman

*plus*

*either:*
Dickson T. R. *The Computer and Chemistry* Freeman
Schaum Outline Series *Numerical Analysis* McGraw-Hill

*or:*
Wallace S. B. *Chemical Oceanography* Harcourt, Brace, Jovanovich

2.043L
**Chemistry and Enzymology of Foods‡** F L2T4

*Prerequisite:* 2.002B. Excluded: 2.013L, 2.023L, 2.053L.

As for 2.013L but in greater detail and depth.

**Textbooks**
No set texts. A list of reference books is provided by the School.

2.053A
**Chemical Kinetics and Reaction Mechanisms** L3T3

*Prerequisite:* 2.002A.


**Textbooks**
Gardiner W. C. *Rates and Mechanisms of Chemical Reactions* Benjamin
Sykes P. *The Search for Organic Reaction Pathways* Longman

2.053L
**Biological and Agricultural Chemistry‡** F L2T4

*Prerequisite:* 2.002B. Excluded: 2.023L, 2.013L, 2.043L.

As for 2.023L but in more detail and depth.

**Textbooks**
No set texts. A list of reference books is provided by the School.

2.063A
**Advanced Molecular Spectroscopy** L2T4

*Prerequisite:* 2.013A.

Theory: Born-Oppenheimer approximation; theory of transition probabilities; group theory; normal mode analysis.

Spectra: rotational, vibrational and electronic structure in molecular spectra, including microwave, infrared, Raman, UV-visible and photoelectron spectra. Kinetic spectroscopy: Lasers.

**Textbook**
Dixon R. N. *Spectroscopy and Structure* Methuen

* Students are given the choice of these two topics.

‡ Only one of these double units may be chosen.
Graduate Study

2.150G
The Chemistry of Natural & Synthetic High Polymers*  S2 L2T4

2.153G
Recent Advances in Chemistry*  F L2T4

Prerequisites and Excluded: None.

The course offered is a double unit comprising approximately 14 the­oretical chemistry. Four topics are covered but the selection of topics may vary from year to year. Although little or no previous knowledge of a topic is assumed in its presentation, each topic is developed to allow appreciation of recent advances in the area.

The course offered is a double unit comprising approximately 14 lectures in each of the four topical sections, together with relevant experimental demonstrations and/or practical and/or project work.

In a given year, areas of chemistry from which the topics are selected include:

Molecular spectroscopic techniques
Catalysis - homogeneous and heterogeneous
Theoretical chemistry
Inorganic chemistry
Lasers in chemistry
Molecular structure determination by spectroscopy
Mass spectrometry
Synthetic organic chemistry
Chemistry of natural products
Chemical kinetics and reaction mechanisms
Isotopes in chemistry

Textbooks
No set texts.

2.154G, 2.155G, 2.156G
Advanced Analytical Chemistry and Chemical Instrumentation*  Units A, B and C

2.231G and 2.242G
Food and Drugs I and II—(Including Pharmacognosy and Microscopy of Crude Drugs)  F L1T3

Regarded as a unit, and may be spread over 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, chemotherapeutic and modes of action, galenicals, identification tests for alkaloids, etc. Analytical chemistry of anaesthetics, sedatives, hypnotics, steroid hormones, antihistamines, etc. Antibiotics, penicillin, streptomycin, aureomycin, sulphonamides. Activity of enzyme preparations; antiseptics and disinfectants; soaps and detergents.

Pharmacognosy and Microscopy of Crude Drugs

A graded course of 20 hours, progressing from relatively simple structures to the examination of adulterated mixtures.


2.251G
Toxicology, Occupational and Public Health  F L1T2

Important classes of toxic materials found in the environment; treatment of pesticide residues, industrial chemicals of various types, toxic gases, mould metabolites and bacterial toxins occurring in food, carcinogenic substances, toxic metals etc. Effects of these substances on living organisms, particularly 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  F L1T3

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  F L1T3

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.

* Units available to students enrolled in the Graduate Diploma in Current Science course.
2.371G  
Treatment of Analytical Data  F L1  

Errors of measurement, the treatment, interpretation and comparison of sets of measurements, associated data and problems involving analysis of variance.

Topics are discussed under the headings: 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  

Engineering  

Undergraduate Study  

5.010  Engineering A  SS L4T2  
Prerequisite:  

MSc Exam  
Grade  
Required  

Either  
2 unit Science (incl. Physics)  
1, 2 or 3  
or  
4 unit Science (incl. Physics)  
1, 2, 3 or 4  
or  
2 unit Industrial Arts  
1, 2 or 3  
or  
3 unit Industrial Arts  
1, 2, 3 or 4  

Students who wish to enrol in this subject can make up for the lack of the prerequisite by work taken in Physics in the first half of first year.


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: The structure and properties of the main types of engineering materials, with emphasis on the way in which properties may be controlled by controlling structure.

Textbooks  
Svensson N. L. Introduction to Engineering Design NSWUP  
For Statics:  
To be advised.  
and  
For Introduction to Materials Science:  
Gordon J. E. The New Science of Strong Materials, or Why You Don’t Fall through the Floor Pelican  
Scientific American Materials Freeman

5.020  Engineering B  SS L4T2  
Co-requisite: 5.010.

Engineering Dynamics: Kinetics of the plane motion of a particle; equations of motion, dynamic equilibrium, work and energy. Kinetics of systems of particles; impulse and momentum. Rotation of rigid bodies about a fixed axis. Belt, rope and chain drives, gear trains.


Textbooks  
For Statics II and Engineering Dynamics:  
To be advised  
For Mechanics of Solids I:  
Hall A. S. Introduction to Mechanics of Solids Wiley

5.030  Engineering C  SS L4T2  

Engineering Drawing: Fundamental concepts of descriptive geometry, including reference systems, representation of point, line and plane; fundamental problems of position and measurement. Application of descriptive geometry to certain problems arising in engineering practice. Special emphasis on ability to visualize problems and processes involved in their solution. Instruction in the correct use of drawing instruments and the application of drawing standards. Measurements and dimensioning. Orthographic and isometric projections.

And one of the following options (determined by the course of study):

1. (Mechanical, Industrial and Aeronautical Engineering and Naval Architecture students must take this option) Design for Manufacture I: Approximately 30 hours of workshop training, including casting, fitting, machining, welding. Principles of design for manufacture.

2. Production Technology: 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.

3. Introduction to Systems and Computers: Introduction to computers to follow the computer work in Mathematics I. To develop: A familiarity with algorithms; B the use of procedure oriented languages; and C an introduction to computing equipment.
Systems. To give students an appreciation of some of the concepts used in engineering, to relate the concepts to phenomena within their experience, and to illustrate them by case histories and engineering examples. Quantities. Concepts. Components. Systems.

4. (Chemical Engineering students must take this option) *Introduction to Chemical Engineering*: Routes to and ends uses of industrial chemicals. Likely new industrial chemicals. A survey of several Australian chemical industries from the point of view of their historical and economic importance. Examination of the unit operations involved in the industry and the raw materials, equipment and services used. Environmen tal aspects of the chemical industry.

5. (Metallurgy students must take this option) *Introduction to Metallurgical Engineering*: 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.


7. (Electrical Engineering students must take this option) *Introduction to Computing*: Introduction to computer program design with emphasis on the design of correct, reliable programs. The subject is organized on a tutorial basis and a number of simple fundamental programming tasks are illustrated. Programs are written in a high level language which provides facilities for the specification of algorithms and data structure.


and

*Introduction to Engineering Construction*: All students are required to visit a nominated construction project as an integral part of the course. Introduction to engineering construction, equipment and methods. The scope of engineering construction, typical projects and decision agents.

Textbooks

For Engineering Drawing:

Robertson R. G. *Descriptive Geometry* Pitman

Thomson R. *Exercises in Graphic Communication* Nelson

For Designs for Manufacture and Production Technology:

De Garbo E. P. *Materials and Processes in Manufacturing* Macmillan

For Introduction to Systems and Computers:

Karbowski A. E. & Huey R. M. eds *Information, Computers, Machines and Man* Wiley

For Introduction to Metallurgical Engineering:

Street A. & Alexander W. O. *Metals in the Service of Man* Penguin

For Introduction to Computing:

With N. *Systematic Programming: An Introduction* Prentice-Hall

For Introduction to Materials II:

Gordon J. E. *The New Science of Strong Materials* Pelican


Street A. *Metals in the Service of Man* Penguin

or

Polakowski N. H. & Ripling E. J. *Strength and Structure of Engineering Materials* Prentice-Hall

or

Wyatt O. & Dew-Hughes D. *Metals, Ceramics and Polymers* CUP

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**Computer Science**

**Undergraduate Study**

6.601A *Introduction to Computer Science* S1 L3T2 and F L1½T1

Prerequisite: 10.001.

Introduction to programming: algorithm and data structure design; programming in a high level algorithmic language which provides simple, high level program-control and data-structuring facilities. Introduction to data structures, Program verification. Introduction to computer organization: simple machine architecture, logical design; data storage devices; simple operating system concepts.

Textbooks

Gear C. W. *Introduction to Computer Science* SRA


6.601B *Assembler Programming and Non-numeric Processing* S2 L3T2 and F L1½T1

Prerequisite: 10.001. Co-requisite: 6.601A.

Computer structure, machine language, instruction execution, addressing techniques and digital representation of data. Symbolic coding. Manipulation of strings, lists and other data structures.
Textbooks
PDP 11/40 Processor Handbook Digital Equipment Corporation
Gray L. D. A Course in APL/360 with Applications Addison-Wesley
or
Gilman G. & Rose P. APL: an Interactive Approach 2nd ed Wiley
or

6.602D Programming Languages and Compiling Techniques S2 L3T2
Prerequisite: 6.601A.
Compiling Techniques: data structures; table look-up; language description; lexical analysis; syntax analysis; semantic analysis/code generation; interpretation/program execution.
Programming Languages: a comparative study.

Mathematics

Undergraduate Study†

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.

10.001 Mathematics I F L4T2
Prerequisite:
HSC Exam Grade Required
2 unit Mathematics 1 or 2
or 3 unit Mathematics 1, 2 or 3
or 4 unit Mathematics 1, 2, 3, 4 or 5 (Grade 5 at a standard acceptable to the Professorial Board)

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

Preliminary Reading List
Bell E. T. Men of Mathematics 2 vols Pelican
Courant R. & Robbins H. What is Mathematics? OUP

† When a unit is listed as a prerequisite or co-requisite, the appropriate higher unit may be substituted.
10.031
Mathematics (one Level II unit)†  F L1T1
Prerequisite: 10.001 or 10.021 (Cr).
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.

Textbook

10.032
Mathematics (one Level III unit)†  F L1T1
Prerequisite: 10.031.
Vector Calculus; special functions; convolution theorem and applications; complex variable theory; Fourier integrals; Laplace transforms with application to ordinary and partial differential equations.

Textbook

10.041
Introduction to Applied Mathematics  S2 L4T2
Co-requisite: 10.001.
Combinatorial mathematics, finite differences, games and networks, hydrostatics, mathematical models.

Pure Mathematics

10.111A
Pure Mathematics II — Linear Algebra  F L1½T½
Prerequisite: 10.001. Excluded: 10.121A.

† These units are also available to Faculty of Science students as a sequence of two units constituting a terminating service course in mathematics. As such they are mutually exclusive to any other Level II or Level III units in Pure and/or Applied Mathematics and/or Theoretical Mechanics.
10.111B
Pure Mathematics II — Analysis  F L1½T½
Prerequisite: 10.001. Excluded: 10.121B.

Textbook
Session 2
Churchill R. V. Complex Variables and Applications ISE McGraw-Hill

10.1111
Pure Mathematics II — Group Theory  S1 L1½T½
Prerequisite: 10.001. Co-requisites: 10.111A, 10.111B, 10.211A. Excluded: 10.121A.
Mathematical systems, groups, determination of small groups, homomorphisms and normal subgroups.

10.1112
Pure Mathematics II — Geometry  S2 L1½T½
Elementary concepts of Euclidean, affine and projective geometries.

Textbook
Gans D. Transformations and Geometries Appleton-Century-Crofts

10.121A
Higher Pure Mathematics II — Algebra  F L2T½

Textbooks
Clark A. Elements of Abstract Algebra Wadsworth
Hoffman K. & Kunze R. Linear Algebra Prentice-Hall

10.121B
Higher Pure Mathematics II Real and Complex Analysis  F L2T½
Prerequisite: 10.011. Excluded: 10.111B.
Construction of reals; uniform convergence; implicit and inverse function theorems; analytic functions; Laurent and Taylor series; calculus of residues.

Textbooks
Session 1

10.121C
Higher Pure Mathematics II — Number Theory and Geometry  F L2T½
Galois fields, quadratic reciprocity, quadratic forms, continued fractions, number theoretic functions; axioms for a geometry. affine geometry, Desargues theorem, projective geometry.

10.112B
Pure Mathematics III — Real Analysis  F L1½T½
Prerequisite: 10.111A, 10.111B. Co-requisite: 10.211A. Excluded: 10.122B.
Convergence of sequences and series; Taylor series; metric spaces; contraction mapping principle; sequences and series of functions; uniform convergence; Fourier series.

Textbook
Clark C. The Theoretical Side of Calculus Wadsworth

10.112C
Pure Mathematics III — Differential Geometry  F L1½T½
Prerequisites: 10.111A, 10.111B. Co-requisite: 10.211A. Excluded: 10.122C.

Textbook
O'Neill B. Elementary Differential Geometry Academic

10.121
Pure Mathematics III — Number Theory  S1 L1½T½
Prerequisite: *** Co-requisites: 10.111A, 10.111B, 10.211A. Excluded: 10.121C.
Euclidean algorithm, congruences, sums of squares, diophantine equations.

*** Students are not normally permitted to attempt a Level III Pure Mathematics unit unless they have completed at least one Level II unit from 10.111A, 10.111B and 10.211A and are concurrently attempting the remaining units of these three units.
10.1122  
Pure Mathematics II — Algebra  
S2 L1\frac{1}{2}T\frac{1}{2}  
Prerequisite: 10.111A. Co-requisites: 10.111B, 10.111F, 10.211A.  
Excluded: 10.122A.  
Rings, polynomials, fields.  
Textbook  
Dean R. A. Elements of Abstract Algebra Wiley

10.1123  
Pure Mathematics III — Set Theory  
S1 L1\frac{1}{2}T\frac{1}{2}  
Prerequisite: ***. Co-requisites: 10.111A, 10.111B, 10.211A.  
Intuitive and axiomatic set theory. Cardinal and ordinal numbers. The axiom of choice.  
Textbook  
Gray J. D. Lecture Notes on Set Theory and Transfinite Arithmetic

10.1124  
Pure Mathematics III — Combinatorial Topology  
S2 L1\frac{1}{2}T\frac{1}{2}  
Prerequisite: 10.111B. Co-requisites: 10.111A, 10.211A.  
Elementary combinatorial topology of surfaces.  
Textbook  

10.1125  
Pure Mathematics III — Ordinary Differential Equations  
S1 L1\frac{1}{2}T\frac{1}{2}  
Prerequisite: ***. Excluded: 10.122E.  
Systems of ordinary differential equations; variations of constants formula; stability; Poincaré space; Lyapunov’s direct method.  
Textbook  
Leighton W. An Introduction to the Theory of Ordinary Differential Equations Wadsworth

10.1126  
Pure Mathematics III — Partial Differential Equations  
S2 L1\frac{1}{2}T\frac{1}{2}  
Prerequisite: ***. Co-requisite: 10.1125.  
Systems of partial differential equations; characteristic surfaces; classifications; Cauchy problem; Dirichlet and Neumann problems; the maximum principle; Poisson’s formula; conformal mapping.  
Textbook  
Dennemeyer R. Introduction to Partial Differential Equations and Boundary Value Problems McGraw-Hill

10.1127  
Pure Mathematics III — History of Mathematics  
S2 L1T1  
Prerequisites: 10.111A, 10.111B, 10.211A.  
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.  
Textbooks  
Midonick H. ed The Treasury of Mathematics Penguin  
Struik D. J. A Concise History of Mathematics Dover

10.122A  
Higher Pure Mathematics III — Algebra  
F L2T\frac{1}{2}  
Prerequisite: 10.121A. Excluded: 10.1122.  
Field theory and theory of rings and modules.  
Textbook  
Stewart I. Galois Theory Chapman & Hall

10.122B  
Higher Pure Mathematics III — Integration and Functional Analysis  
F L2T\frac{1}{2}  
Prerequisite: 10.121B. Excluded: 10.112B.  
Lebesgue Integration; Fourier series; normed vector spaces; Hilbert spaces; measure theory.  
Textbook  
Simmons G. F. Introduction to Topology and Modern Analysis ISE McGraw-Hill

10.122C  
Higher Pure Mathematics III — Topology and Differential Geometry  
F L2T\frac{1}{2}  
Prerequisite: 10.121A, 10.121C. Excluded: 10.1124, 10.112C.  
The axiom of choice, metric and topological spaces, compactness. Compact surfaces, triangulations, geodesics, Gauss-Bonnet theorem.  
Textbook  
Simmons G. F. Introduction to Topology and Modern Analysis ISE McGraw-Hill

*** Students are not normally permitted to attempt a Level III Pure Mathematics unit unless they have completed at least one Level II unit from 10.111A, 10.111B and 10.211A and are concurrently attempting the remaining units of these three units
**10.122E**

**Higher Pure Mathematics III — Complex Analysis and Differential Equations**  
F L2T½  

*Prerequisite: 10.121B. Excluded: 10.1125.*

Analytic continuation; entire and meromorphic functions; elliptic functions; normal families and further advanced topics in complex analysis. Existence and uniqueness theorems for ordinary differential equations; linear systems; qualitative theory of autonomous systems; equations on manifolds.

**Textbooks**

Session 1  
Knopp K. *Theory of Functions. Part II* Dover

Session 2  
Roxin E. O. *Ordinary Differential Equations* Wadsworth

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**10.123**

**Pure Mathematics IV**

An honours program consisting of the preparation of an undergraduate thesis together with advanced lecture courses 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.

For textbooks, see lecturers concerned.

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**Applied Mathematics**

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**10.211A**

**Applied Mathematics II — Mathematical Methods**  
F L1½T½  

*Prerequisite: 10.001. Excluded: 10.221A.*

Review of functions of two and three variables, divergence, gradient, curl, line, surface, and volume integrals; Green's and Stokes' theorems. Special functions, including gamma and Bessel functions. Differential equations and boundary value problems, including vibrating string and vibrating circular membrane; Fourier series.

**Textbooks**


Spiegel M. R. *Advanced Mathematics for Scientists and Engineers* Schaum

Spiegel M. R. *Theory and Problems of Vector Analysis* Schaum

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**10.211D**

**Applied Mathematics II—Introduction to Optimization Theory and its Applications**  
F L1½T½  

*Prerequisite: 10.001. Excluded: 10.221D.*


**Textbook**


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**10.221A**

**Higher Applied Mathematics II—Mathematical Methods**  
F L1½T½  

*Prerequisite: 10.011 or 10.001 (Dist). Excluded: 10.211A.*

As for 10.211A but in greater depth.

**Textbooks**

Queen N. M. *Vector Analysis* McGraw-Hill

Rabenstein A. L. *Introduction to Ordinary Differential Equations* Academic Int. ed

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**10.221D**

**Higher Applied Mathematics II—Introduction to Optimization Theory and its Applications**  
F L1½T½  

*Prerequisite: 10.011 or 10.001 (Dist). Excluded: 10.211D.*

As for 10.211D but in greater depth.

**Textbooks**

As for 10.211D

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**10.212A**

**Applied Mathematics III—Numerical Analysis**  
F L1T1  

*Prerequisites: 10.211A, 10.111A. Excluded: 10.222A.*


**Textbook**


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**10.212L**

**Applied Mathematics III—Optimization Methods**  
F L1½T½  

*Prerequisites: 10.211A, 10.111B, 10.111A. Co-requisite: 10.211D*.  
Excluded: 10.222L.

* Effective from 1978 only. Students enrolling in 10.212L (10.222L) in 1977 should not enrol in 10.211D (10.221D).
10.212M
Applied Mathematics III—Optimal Control Theory  F  L1½T½
Prerequisites: 10.211A, 10.111A, 10.111B. Excluded: 10.222M.
Optimal control of systems described by difference equations, continuous-time dynamic programming, calculus of variations, Pontryagin maximum principle, stochastic decision processes. Applications of control theory to resource allocation, control of production, investment, inventory, and advertising, and to models of the economy.

Textbooks
Jacobs O. L. R. Introduction to Control Theory OUP

10.222A
Higher Applied Mathematics III—Numerical Analysis  F  L1T1
Prerequisites: 10.221A or 10.211A (Dist), 10.121A or 10.111A (Dist). Excluded: 10.212A.
As for 10.212A but in greater depth.

10.222C
Higher Applied Mathematics III—Maxwell’s Equations and Special Relativity  F  L1½T½
Prerequisites: 10.221A or 10.211A (Dist), 10.121B or 10.111B (Dist). 1.001. Excluded: 1.033.
Electrostatic and quasi-static magnetic fields; mathematical formulation of basic laws, field equations, methods of solution, general theorems, polarization, energy and mechanical forces. Electromagnetic fields: Maxwell’s equations, Poynting theorem, Maxwell stress tensor, electromagnetic momentum and radiation pressure, electromagnetic potentials, radiation, vector wave equation, solutions, cavity resonators, waveguides. Relativity: relativistic kinematics, dynamics and electrodynamics, radiation from moving charges, radiation damping.

Textbook
Jackson J. D. Classical Electrodynamics Wiley

10.222F
Higher Applied Mathematics III—Quantum Mechanics  F  L1½T½
Prerequisites: 10.221A or 10.211A (Dist), 10.121A or 10.111A (Dist), 10.121B or 10.111B (Dist). Excluded: 1.013.

Textbook
Merzbacher E. Quantum Mechanics 2nd ed Wiley

10.222L
Higher Applied Mathematics III—Optimization Methods  F  L1½T½
Prerequisites: 10.221A or 10.211A (Dist), 10.121A or 10.111A (Dist), 10.121B or 10.111B (Dist). Co-requisite: 10.221D or 10.211D*. Excluded: 10.212L.
As for 10.212L but in greater depth.

Textbooks
Adby P. R. & Dempster M. A. H. Introduction to Optimization Methods Chapman & Hall
Intrilligator M. D. Mathematical Optimization and Economic Theory Prentice-Hall

10.222M
Higher Applied Mathematics III—Optimal Control Theory  F  L1½T½
Prerequisites: 10.221A or 10.211A (Dist), 10.121A or 10.111A (Dist), 10.121B or 10.111B (Dist). Excluded: 10.212M.
As for 10.212M but in greater depth.

Textbooks
Jacobs O. L. R. Introduction to Control Theory OUP

10.223
Applied Mathematics IV
An honours program consisting of the preparation of an undergraduate thesis together with advanced lecture courses. Lecture topics include selections from: advanced optimization and control theory, functional analysis and applications, numerical analysis, mathematics of economic models and of economic prediction, stability theory of differential and differential-difference equations, stochastic processes, statistical mechanics, quantum physics, astro-physics. With permission of the Head of Department, the subject may also include advanced lecture courses given by other Departments or Schools.

Textbooks
No set texts.
10.233
Applied Mathematics IV (Short Course)
6 units consisting of the preparation of an undergraduate thesis together with advanced lecture courses. Lecture topics include selections from: advanced optimization and control theory, functional analysis and applications, mathematics of economic models and of economic prediction, stability theory of differential and differential-difference equations, stochastic processes. With permission of the Head of Department, the subject may also include advanced lecture courses given by other Departments or Schools.

Textbooks
No set texts.

Statistics

10.311A
Theory of Statistics II — Probability and Random Variables
Prerequisite: 10.001 or 10.021 (Cr). Excluded: 10.311A, 10.331, 45.101.
An introduction to axiomatic treatment of probability. Variates (univariates, multivariate, expectations, moment generating and characteristic functions), standard distributions, sampling distributions.

Introductory Reading
Moroney M. J. Facts from Figures Pelican
Mosteller F. ed Statistics by Example Vols 1-4 Addison-Wesley
Schmidt M. J. Understanding and Using Statistics Heath

Textbooks
Larson H. J. Introduction to Probability and Statistical Inference 2nd ed Wiley
Statistical Tables

10.312A
Theory of Statistics III — Probability and Stochastic Processes
Prerequisite: 10.311A, 10.111A, 10.111B, 10.211A. Excluded: 10.322A.

Textbooks
Bailey N. J. T. Elements of Stochastic Processes with Applications to the Natural Sciences Wiley
Heathcote C. R. Probability: Elements of the Mathematical Theory Allen & Unwin
10.312B
Theory of Statistics III —
Experimental Design (Applications) and Sampling  S2 L2T2
Prerequisite: 10.311B or 10.331 (normally Cr). Co-requisite: 10.211A.
Excluded: 10.322B.
Principles of good experimental design. Completely randomized experiment.
Analysis of factorial experiments. Multiple comparison methods. Random
models. Split plot design. Sampling theory.

10.312C
Theory of Statistics III —
Experimental Design (Theory)  S1 L2T2
Prerequisites: 10.311B, 10.111A, 10.111B, 10.211A. Co-requisites: 10.312B, plus any two level
III Pure Mathematics or Applied Mathematics or Theoretical Mechanics units. Excluded: 10.312C.
theorem. Hypothesis testing. Analysis of variance.

Textbook
Graybill F. A. An Introduction to Linear Statistical Models McGraw-Hill

10.312D
Theory of Statistics III —
Probability Theory  S2 L2T2
Prerequisites: 10.311A, 10.111A, 10.111B, 10.211A. Excluded: 10.322D
Rigorous treatment of probability and moment generating functions
and characteristic functions. Convergence in probability. Weak law
of large numbers. Almost sure convergence. Strong law of large
treatment of Markov chains. Markov chains with continuous para-
ter.

Textbook
Heathcote C. R. Probability: Elements of the Mathematical Theory
Allen & Unwin

10.312E
Theory of Statistics III —
Statistical Inference  S2 L2T2
Prerequisites: 10.311B, 10.111A, 10.111B, 10.211A. Co-requisites:
Any two level III Pure Mathematics or Applied Mathematics or
Theoretical Mechanics units. Excluded: 10.322E.
Bayesian inference and decision theory. Classical inference. Contingency tables (large sample and exact tests). Order Statistics. Non-
parametric methods.

Textbooks
Mood A. M., Graybill F. A. & Boes D. C. Introduction to the Theory
Kendall M. G. & Stuart A. The Advanced Theory of Statistics Vol 2
Griffin

10.322A
Higher Theory of Statistics III —
Probability and Stochastic Processes  S1 L2½T2
Prerequisites: 10.321A, 10.111A, 10.111B, 10.211A. Excluded:
10.312A.
As for 10.312A but in greater depth.

Textbooks
Bailey N. J. T. Elements of Stochastic Processes with Applications
to the Natural Sciences Wiley
Heathcote C. R. Probability: Elements of the Mathematical Theory
Allen & Unwin

10.322B
Higher Theory of Statistics III —
Experimental Design (Applications) and Sampling  S2 L2½T2
Prerequisites: 10.321B, 10.111A, 10.111B, 10.211A. Excluded: 10.312B.
As for 10.312B but in greater depth.

Textbooks
Cochran W. G. & Cox G. M. Experimental Designs I, S. E. Wiley
Statistical Tables

10.322C
Higher Theory of Statistics III —
Experimental Design (Theory)  S1 L2½T2
Prerequisites: 10.321B, 10.111A, 10.111B, 10.211A. Co-requisites: 10.322B, plus any two level
III Pure Mathematics or Applied Mathematics or Theoretical Mechanics units. Excluded: 10.312C.
As for 10.312C but in greater depth.

Textbooks
As for 10.312C.

10.322D
Higher Theory of Statistics III —
Probability Theory  S2 L2½T2
Prerequisites: 10.321A, 10.111A, 10.111B, 10.211A. Excluded: 10.312D.
As for 10.312D but in greater depth.

Textbooks
As for 10.312D.
**10.322E**
**Higher Theory of Statistics III — Statistical Inference**  
S2 L2½T2

Prerequisites: 10.321B, 10.111A, 10.111B, 10.211A. Co-requisites: Any two level III Pure Mathematics or Applied Mathematics or Theoretical Mechanics units. Excluded: 10.312E.

As for 10.312E but in greater depth.

**Textbooks**
As for 10.312E.

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**10.323**
**Theory of Statistics IV**


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**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 \( \chi^2 \) 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.

**Textbooks**
Freund J. E. *Mathematical Statistics* 2nd ed Prentice-Hall  
Kreyszig E. *Introductory Mathematical Statistics* Wiley  
*Statistical Tables*

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**Theoretical and Applied Mechanics**

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**10.411B**
**Theoretical Mechanics II — Principles of Theoretical Mechanics**  
S1 L3T1

Prerequisites: 10.001, 1.001 or 10.041 or 5.010.  
Co-requisites: 10.211A, 10.111B. Excluded: 10.421B

Revision of vectors, kinematics of particles and rigid bodies. Dynamics of particles including simple harmonic and projectile motion. Systems of particles: conservation principles, collisions, rocket motion, the catenary. Work and energy. Rotating frames; moments of inertia. Elementary problems derived from continuum mechanics including conservation laws, one-dimensional fluid flow, extension and bending of beams.

**Textbook**
Smith R. C. & Smith P. *Mechanics* Wiley

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**10.421A**
**Higher Theoretical Mechanics II — Hydrodynamics**  
S2 L3T1

Prerequisite: 10.011 or 10.001 (Dist). Co-requisite: 10.421B. Excluded: 10.411A.

As for 10.411A but in greater depth.

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**10.421B**
**Higher Theoretical Mechanics II — Principles of Theoretical Mechanics**  
S1 L3T1

Prerequisites: 10.011 or 10.001 (Dist), 1.001 or 5.010 or 10.041.  
Co-requisites: 10.221A, 10.111B. Excluded: 10.411B.

As for 10.411B but in greater depth.

**Textbook**
Symon K. R. *Mechanics* 3rd ed Addison-Wesley

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**10.412A**
**Theoretical Mechanics III — Dynamical and Physical Oceanography**  
F L1½T½

Prerequisites: 10.211A or 10.031, 1.001. It is recommended that one of the following be taken concurrently: 10.411A or 1.012 or 1.913.

1. The physical properties of the oceans and their measurement, including salinity, temperature, density, dynamic heights. Currents, waves and tides. 2. Theoretical models of current and waves.

Up to seven days field/laboratory work per year.
10.412B
Theoretical Mechanics III — Continuum Mechanics
F L1½T½
Prerequisites: 10.211A, 10.111A, 10.111B. Co-requisite: 10.411A or 1.012 or 1.913. Excluded: 10.422D.


10.412D
Theoretical Mechanics III — Mathematical Methods
F L1½T½
Prerequisites: 10.211A, 10.111A, 10.111B. Excluded: 10.422D.

 Sturm-Liouville equation, eigenvalues, expansion in orthonormal functions. Fourier, Fourier-Bessel and Legendre series as special cases. Fourier and Laplace transforms, with application to ordinary and partial differential equations. Diffusion equation and transmission-line equation. Wave equation.

Textbooks
Rabenstein A. L. Introduction to Ordinary Differential Equations Academic.

10.422A
Higher Theoretical Mechanics III — Fluid Dynamics
S2 L3T1
Prerequisite: 10.421A or 10.411A (Dist). Co-requisite: 10.422B.

 Compressible flow, viscous flow, boundary layers, hydrodynamic stability, simple wave motions in fluids.

Textbook
Bachelor G. K. An Introduction to Fluid Dynamics C.U.P.*

10.422B
Higher Theoretical Mechanics III — Mechanics of Solids
S1 L3T1
Prerequisites: 10.111A, 10.111B, 10.211A, 10.421B or 10.411B (Dist) or 1.012. Excluded: 10.412B.

As for 10.412B but in greater depth.

10.422D
Higher Theoretical Mechanics III — Mathematical Methods
F L1½T½
Prerequisites: 10.221A or 10.211A (Dist), 10.121A or 10.111A (Dist). 10.121B or 10.111B (Dist). Excluded: 10.412D.


10.423
Theoretical Mechanics IV
An honours program consisting of the preparation of an undergraduate thesis together with advanced lecture courses on topics chosen from fluid mechanics, solid mechanics, planetary science and special mathematical and numerical techniques applied to partial differential equations. With the permission of the Head of Department, the subject may also include advanced lecture courses given by other Departments or Schools on topics such as optimal control theory, optimization theory, thermodynamics, numerical analysis or statistics.

Textbooks
No set texts.

Graduate Study

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.

10.073G
Advanced Mathematical Analysis of Data
Basic concepts, potential theory, Hilbert Transforms; Interpretation of time series; interpretation of field data, eg smoothing procedures, noise elimination, filter theory, reduction of field data; approximation techniques, eg evaluation of slowly convergent series, estimation of geometric properties of equations.

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; advanced numerical analysis; theory of functions; finite mathematics; number theory; logic; theoretical astrophysics; history of mathematics; recent advances in mathematics; mathematical economics; optimization and control.

10.372G
Statistics 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 analysis, purpose of randomisation, how the physical circumstances of an experiment are related to its formal model on which its analysis 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 randomised design, the randomised block design, the 2^4 factorial fully randomised design, and the fully randomised 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 I
Modified designs for fixed effects models. Incomplete and balanced incomplete block designs. Confounding and fractional replication. Randomization theory. Multiple comparisons.

Textbooks
Kempthorne O. The Design and Analysis of Experiments Wiley
John P. W. M. Statistical Design and Analysis of Experiments Macmillan

10.382G Experimental Design II
Extensive treatment of random and mixed models. Combinatorial structure of designs, cross-over and lattice designs, response surfaces.

10.383G Stochastic Processes

Textbooks
Cox D. R. & Smith W. Queues Methuen
Feller W. An Introduction to Probability Theory and its Applications Vols I & II Wiley

10.384G Time Series

Textbook
Jenkins G. M. & Watts D. G. Spectral Analysis and its Applications Holden-Day

10.385G Multivariate Analysis I
Likelihood ratio tests for means, variances and structure. Discriminant, principal component, canonical and factor analysis.

10.386G Multivariate Analysis II
The general linear hypothesis and analysis of dispersion. Tests based on roots, distribution theory.

Textbooks
Anderson T. W. An Introduction to Multivariate Statistical Analysis Wiley
Kshirsagar A. M. Multivariate Analysis. Marcel Dekker

10.387G Non-Experimental Statistics
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.

Textbook
Wald A. Sequential Analysis Wiley

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
Subject Descriptions and Textbooks

10.393G
Special Topic B
To be arranged, eg biological statistics, advanced order statistics, population statistics, non-linear programming, discrete distribution theory and other topics.

10.401G
Seiches and Tides

Psychology

Undergraduate Study

12.001
Psychology I F L3T2
Introduction to the content and methods of psychology as a behavioural science, with special emphasis on (a) the biological and social bases of behaviour, (b) learning, and (c) individual differences. Includes training in methods of psychological enquiry, and the use of elementary statistical procedures.

Textbooks
Lumsden J. Elementary Statistical Method Rev ed WAUP
Mednick S. A., Higgins J. & Kirschenbaum J. Psychology: Explorations in Behavior and Experience Wiley Int ed or
Selected Scientific American reprints as advised by the School

12.004
Psychology IV F
Prerequisites: All other Course requirements.

Psychology IV in the BSc in Psychology course. A program of selected study from the School's Advanced Electives, chosen in consultation with the Head of School or his representative, plus a research thesis or project. Combinations of electives are available for students intending to specialize in areas of professional practice (eg clinical, industrial, social psychology) or in research.

12.014
Psychology IV (Research) F
Prerequisites: 12.001, 12.052, 12.062, 12.152, 12.153 and 3 other Psychology Level III units at an average level of Credit or better.

Psychology IV in the Science and Mathematics Course. Research and thesis, course work and readings to be determined in consultation with the Head of School.

12.042
Psychology IIA F L2T2
Prerequisite: 12.001. Co-requisites: 12.052, 12.062, 12.152.

BSc in Psychology students only.

12.044
Psychology IV (Course Work) F
Prerequisites: 12.001, 12.052, 12.062, 12.152, 12.153, 12.163 and 6 other Psychology Level III units at an average level of Credit or better.

Psychology IV in the Science and Mathematics Course. Course work, practicum, project and readings to be determined in consultation with the Head of School.

12.052
Basic Psychological Processes II S1 L2T2
Prerequisite: 12.001.

The basic phenomena of behaviour and experience in a biological context.

Textbooks
Gray J. A. The Psychology of Fear and Stress World Univ Library
Seligman M. E. P. Helplessness Freeman

12.062
Complex Psychological Processes II S2 L2T2
Prerequisite: 12.001.

Students select for concentrated study two areas from visual perception, social bases of behaviour, and information processing and cognitive functioning.

Information Processing and Cognitive Functioning
Textbook
Horton D. L. & Turnage T. W. Human Learning Prentice-Hall

Perception
Textbook
12.152 Research Methods II F L2T1
Prerequisite: 12.001.
Introduction to the design and analysis of experiments; hypothesis testing, estimation, power analysis; general treatment of simple univariate procedures; correlation and regression.

Textbooks
Anderson B. F. The Psychology Experiment: An Introduction to Scientific Method 2nd ed Brooks/Cole

12.153 Research Methods IIIA S1 L2T2
Prerequisites: 12.052, 12.062, 12.152.
Analysis of variance — one way and complete factorial designs. Elementary Fortran programming, emphasizing editing of data for use in package programs.

Textbook
Hays W. L. Statistics International ed Holt, Rinehart & Winston

12.163 Research Methods IIIB S2 L2T2
Prerequisite: 12.153.
Experimental Design; complex analysis of variance; planned and post hoc comparisons; multivariate procedures as data reduction techniques.

Textbook
Hays W. L. Statistics International ed Holt, Rinehart & Winston

12.173 Psychological Issues* S1 L2T2
Historical background to modern psychology, emphasizing philosophical, conceptual, and methodological problems. Literature project.

12.253 Learning IIIA S1 L2T2
Prerequisites: 12.052, 12.062, 12.152.
The basic operations and processes in classical and operant conditioning. Includes reinforcement, punishment, behavioural contrast, adjunctive behaviours, the classical conditioning of skeletal responses (sign-tracking), and the operant conditioning of autonomic responses.

Textbook
Mackintosh N. J. The Psychology of Animal Learning Academic

12.263 Learning IIIB S2 L2T2
Prerequisite: 12.253.
The conditions under which animals select stimuli to become signals for other events. Theories concerned with how this is accomplished. Includes blocking, conditioned inhibition, higher-order conditioning, CS-US specificity, and long-delay learning.

Textbook
Mackintosh N. J. The Psychology of Animal Learning Academic
A list of papers that are required reading for the course is available from the School office.

12.303 Personality IIIA S1 L2T2
Prerequisites: 12.052, 12.062, 12.152.
The development of personality, with reference to biological and social determinants. Personality dynamics and structure. Human potential: the humanist-existential tradition.

12.313 Personality IIIB* S1 L2T2
The psychology of interpersonal relationships and transactions. Techniques of interpersonal influence.

12.323 Motivation IIIA* S1 L2T2
Prerequisites: 12.052, 12.062, 12.152.
The conditions governing the arousal and direction of behavioural sequences, with particular reference to the social determinants of the goals of behaviour.

12.373 Psychological Assessment (Testing) IIIA S1 L2T2
Prerequisites: 12.052, 12.062, 12.152.
Principles and techniques of psychological assessment. Types of tests and their application in selection and allocation procedures.

12.383 Psychological Assessment (Psychometric Theory) IIIB* S2 L2T2
Prerequisites: 12.052, 12.062, 12.152.

* Not offered in 1977.
12.402
Physiological Psychology  F  L2T2
Prerequisites: 12.001, 17.011, 17.021.
BSc in Psychology students only.

Textbook
Thompson R. F. Introduction to Physiological Psychology Harper & Row

12.413
Physiological Psychology IIIA  S1 L2T2
Prerequisites: 12.052, 12.062, 12.152. Excluded: 12.402.
Elementary neurophysiology, neuropharmacology and neuroanatomy. Brain control of eating, aggression, copulation, memory, language and functional disorders.

Textbook
As for 12.402.

12.423
Physiological Psychology IIIB  S2 L2T2
Prerequisite: 12.413. Excluded: 12.402.

Textbook
As for 12.402.

12.463
Human Information Processing IIIB*  S1 L2T2
Prerequisite: 12.453.

12.473
Perception IIIA  S1 L2T2
Prerequisites: 12.052, 12.062, 12.152.
The characteristics and processes of visual perception. Topics include the basic requirement for visual perception and the relative contributions of the observer and the stimulus in a range of visual situations.

Textbooks
McNicol D. A Primer of Signal Detection Theory Allen & Unwin 1972

12.483
Perception IIIB  S2 L2T2
Prerequisites: 12.052, 12.062, 12.152.
Man in a spatial environment. A study of the organization and stability of the visual world with particular reference to the constancies, object movement, eye movement and locomotion.

Textbook

12.503
Social Psychology IIIA  S1 L2T2
Prerequisites: 12.052, 12.062, 12.152.
Social influence, and the effects of others on judgements and behaviour in different situations.

Textbook
Aronson E. The Social Animal 2nd ed Freeman

12.513
Social Psychology IIIB  S2 L2T2
Prerequisite: 12.503.
Current concepts, and developments in the analysis of social behaviour.

Textbook
A reading list is available from the School.

* Not offered in 1977.
12.553 Developmental Psychology IIIA  S1 L2T2
Prerequisites: 12.052, 12.062, 12.152.

An introduction to the study of cognitive development set loosely within the framework of Piagetian theory. Includes the development of perception with special reference to the nativism/empiricism issue, the development of operational thought with emphasis on its origins in sensori-motor intelligence, the development of language and its relationship to the development of thought, and the development of reading.

Textbooks
Dale P. S. Language Development: Structure and Function Dryden
Ginsburg H. & Opper S. Piaget’s Theory of Intellectual Development Prentice-Hall.
Selected Scientific American reprints as advised by the school.

12.563 Developmental Psychology IIIB  S2 L2T2
Prerequisites: 12.052, 12.062, 12.152.

If offered in 1977, subject description and a detailed reading list is available from the School.

12.603 Abnormal Psychology IIIA  S1 L2T2
Prerequisites: 12.052, 12.062, 12.152.

Conflict, anxiety and avoidance behaviour. Anti-social behaviour, psychosomatic disorders, brain pathology, mental deficiency, schizophrenia, depression, sexual anomalies, methods of diagnosis and treatment.

12.613 Abnormal Psychology IIIB*  
Prerequisite: 12.603.

Techniques and findings of experimental psychopathology. Measurement and assessment problems relating to description and prediction in the field of abnormal behaviour. Evaluation of treatment and intervention programs.

12.623 Guidance and Counselling III  S2 L2T2
Prerequisites: 12.052, 12.062, 12.152. Excluded: 12.313.

A review of significant therapeutic approaches from prior to Freud through to the present day and their implied views of man. The concluding section of the course is concerned with the problems of evaluation of effects of psychotherapy. The direct sources of the theories of eg Freud, Miller & Dollard, Wolpe, Ellis, Rogers, Perls, Janov.

12.653 Industrial Psychology III  S1 L2T2
Prerequisites: 12.052, 12.062, 12.152.

The role of the psychologist in industry. Problems of power, authority and control. Theories of human nature and motivation, and their use by industrial psychologists. Work organization and physical conditions affecting work behaviour.

Textbook
A reading list is available from the School.

12.663 Ergonomics III  S2 L2T2
Prerequisites: 12.052, 12.062, 12.152.

A restricted unit for potential Psychology IV students approved by the Head of School.

Aspects of human performance relevant to work design. The principles involved in designing the environment in general, and work in particular, to suit man's capabilities.

Textbooks
Edholm O. G. The Biology of Work World University Library
Singleton W. T. Introduction to Ergonomics WHO

12.703 Psychological Techniques III  S2 L2T2
Prerequisites: 12.052, 12.062, 12.152, 12.373.

A restricted unit for potential Psychology IV students approved by the Head of School.

Observation, and other forms of appraisal, eg ratings, interviewing, testing and reporting on assembled data about individuals.

12.713 Behaviour Control and Modification III  S2 L2T2
Prerequisites: 12.052, 12.062, 12.152. Excluded: 12.042.

Aversive and appetitive reinforcement in the control and modification of undesirable behaviour. Conditions which influence behaviour; attitude change. Ethical issues.

12.733 Laboratory Instrumentation III  S2 L2T2
Prerequisites: 12.052, 12.062, 12.152.

A restricted unit for potential Psychology IV students approved by the Head of School.

* Not offered in 1977.
12.741 Psychology (Optometry)  F L2T0

Prerequisite: 12.001.

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 concept of normality-abnormality, and an examination of the principal psychodynamic processes. Causes and symptoms of various mental disorders are introduced with some emphasis on symptoms and their importance in optometrical practice.

Textbooks
Part A: Visual Perception
Haber R. N. & Hershenson M. The Psychology of Visual Perception
Holt, Rinehart & Winston

Part B: Abnormal Psychology
Coleman J. C. Abnormal Psychology and Modern Life 4th ed Scott, Foresman

Graduate Study

12.221G Experimental Analysis and Modifications of Problem Behaviour

The application of the principles of experimental psychology to the understanding and modification of a range of clinical problems (eg, anxiety reactions, sexual disorders, alcoholism and other addictions, enuresis, speech problems and the behaviour problems of children) using a range of techniques (eg, systematic desensitization, aversive conditioning, operant conditioning, and individual and social behaviour). Methods of behavioural modification through verbal and non-verbal interpersonal influences. Problems of self regulation of behaviour.

12.228G Research Project

An individual research project in the general area of clinical or community psychology with supporting seminars covering the selection and formulation of a problem, the choice of a design, the planning of the general methodology and the treatment of data.

12.229G Graduate Seminar

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.

12.231G Professional Practice

Supervised clinical practice in approved institutions, or other approved practical experience.

12.232G Theory and Practice of Psychodynamic Therapy

The application of psychodynamic systems and psychological theories of development to the diagnosis and treatment of a range of psychological disorders in children and adults. Theory and the clinical application of transference and counter-transference. The study and application of various systems of psychotherapy and the clinical management of psychological disorders by a variety of psychotherapeutic and interpersonal therapeutic procedures.

12.233G Psychodiagnosis and Clinical Assessment

The application of psychological theories and techniques to the diagnosis and assessment of abnormal and deviant behaviour in children and adults.

12.235G Community Psychology

Psychological theory and practice in relation to community health and community psychological health and the institutional management of psychological problems. Theory sections will include cultural and interpersonal influences on health; social factors (eg, social class, crises, community attitudes); economic and manpower problems of health delivery; politics of health care. Practical sections emphasize work in community health centres, and include community organization, research and evaluation, planning, health education, assessment of community attitudes, and social intervention.

12.236G Community Health

Economic, ethnic and geographic factors in health status and health care, groups at risk; sexual and marital problems; drug usage and health.

12.238G Group Techniques

Training in interpersonal sensitivity, group dynamics, family therapy or other group procedures.
12.239G
Research Methods in Clinical and Community Psychology
Problems of experimental design in the clinical field: measurement and scaling; analysis of change, including sequential analysis, and the application of the experimental method to the individual case. Design and evaluation of community programs.

12.240G
Graduate Seminar
A series of seminars in areas of psychology of particular relevance to the field of specialization: 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.

12.241G
Graduate Colloquium
Participation in staff-graduate student colloquium.

General Biology

Undergraduate Study

17.011
Biology of Mankind
Prerequisites: HSC Exam Grade Required
2 unit Science (any strands) 1, 2 or 3
or
4 unit Science (any strands) 1, 2 or 3

Textbooks
Day M. H. The Fossil History of Man OUP
Miller G. T. Living in the Environment Wadsworth
Napier J. R. Primates and their Adaptations OUP

17.021
Comparative Functional Biology
Prerequisite: 17.011.
Maintenance of the organism: gas exchange systems in plants and animals; transport inside organisms; uptake, digestions, absorption; enzymes structure and function. Photosynthesis: process and structural relationships; metabolic systems, energy yields and pathways. Developing organisms: sexual reproduction in plants and animals, general life cycle patterns; cell development and differentiation in flowering plants and mammals. Control and co-ordination in organisms: organisms and water, uptake and effects; control mechanisms, urinary systems and kidney structure and function. Stimuli and responses: plant hormones, hormones in vertebrate animals, muscle activity and muscle structure, eye structure and vision mechanism; ear structure and hearing mechanism; nerves, central nervous system, nerve action, brain structure and functioning.

Textbooks
Abercrombie M. et al A Dictionary of Biology Penguin
Roberts M. B. V. Biology: A Functional Approach 2nd ed Nelson

Requirements for Practical Work
A list of equipment required for practical work is posted on the notice board in the ground floor of the Biological Sciences Building. Students must purchase this material before the first practical class.
17.012
General Ecology S1 L2T4

Prerequisites: 17.011, 17.021.

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.

Textbooks
Odum E. P. Fundamentals of Ecology Saunders
Watt K. E. F. Principles of Environmental Science McGraw-Hill

Geology

Undergraduate Study

25.011 Geology I F L3T3

Prerequisites: HSC Exam Grade Required
2 unit Science (any strands) or
4 unit Science (any strands) 1, 2 or 3

Excluded: 25.151.

Physical Geology: The origins, structure and main surface features of the earth; geological cycle — processes of erosion, transportation, sedimentation and lithification. Surface and sub-surface water. Weathering, lakes, rivers, glacial phenomena. Volcanism, earthquakes, organogenesis and epeiricogenesis, integrated theory of plate tectonics and continental drift.


Petrology: Field occurrence, lithological characteristics and structural relationships of igneous, sedimentary and metamorphic rocks. Introduction to coal, oil and ore deposits.

Stratigraphy and Palaeontology: Basic principles of stratigraphy; introductory palaeontology. The geological time scale. The geological history of the Australian continent and more specifically that of New South Wales in introductory outline.

Practical Work: Preparation and interpretation of geological maps and sections. Map reading and use of simple geological instruments. Study of simple crystal forms and symmetry. Applied stereoscopic projection. Identification and description of common minerals and rocks 'n hand specimen. Recognition and description of examples of important fossil groups. Supplemented by three field tutorials, attendance at which is compulsory.

Textbooks
Black R. M. Elements of Palaeontology CUP
Judson S., Detleyes K. S. & Hargraves R. B. Physical Geology Prentice-Hall
Rutley F. Elements of Mineralogy Read H. H. ed Murby
Tyrrell G. W. The Principles of Petrology; Metamorphism

25.012 Geology IIa F L3T3

Prerequisites: 25.011, 2.121, 2.131.

Structural Geology: Origin, classification and description of structures in sedimentary, igneous, and metamorphic rocks. Introduction to the stereographic projection of structural elements, and analysis of simple fracture and fold systems. Introduction to tectonics.

Mineralogy, Igneous & Metamorphic Petrology: Principles of optical crystallography and the use of the polarizing microscope. Chemical and physical properties of the main groups of minerals. Occurrence, genesis and classification of igneous rocks. Magmatic crystallization and differentiation. Simple binary and ternary systems.

Origin and classification of metamorphic rocks. ACF and AKF diagrams and metamorphic facies.

Practical: Mesoscopic and microscopic examination of rock forming and ore minerals, igneous and metamorphic rocks.

Photogeology: The use of air photos for geological mapping and geomorphological evaluation of land. Techniques and principles of photo interpretation, multiband photography, landform genesis and photo interpretation of folds, faults, joints, bedding, limestone, intrusive igneous rocks, volcanics, alluvial fans and terraces, slopes, landslides, coastal arid and tropical landforms; relations between geology, drainage, soil and vegetation; orebody expression, gossans, colouration halos.

Field work of up to six days is a compulsory part of the course.

Textbooks
Structural Geology
Hobbs, B. E., Means W. D. & Williams P. F. Outline of Structural Geology Wiley Int
Ragan D. M. Structural Geology: An Introduction to Geometrical Techniques 2nd ed Wiley

Mineralogy, Igneous and Metamorphic Petrology
Blish F. D. An Introduction to the Methods of Optical Crystallography Holt, Rinehart & Winston
Fyfe W. S. Geochemistry OUP
Hyndman P. W. Petrology of Igneous and Metamorphic Rocks McGraw-Hill

Photogeology
Sciences

**25.022**  
**Geology IIB**  
F L1T2

**Prerequisites:** 25.011, 2.121, 2.131.

**Stratigraphy:** Flow regime and bedding forms including flume experiments, sedimentary structures. Modern and ancient environments of deposition: fluvial, deltaic coastal, shelf, slope and deep sea environments. The facies concept. Stratigraphic principles. Fold Belts, geosynclines and their interpretation by plate tectonic models. Stratigraphic and structural development of a fold belt (Lachlan Fold Belt) and an intracratonic basin (Sydney Basin).

**Palaeontology:** Morphology and stratigraphic distribution of the Protozoa, Porifera, Coelenterata, Bryozoa, Brachiopoda and Mollusca. Practical examination of representative fossils from each phyla.

**Field work of up to six days is a compulsory part of the course.**

**Textbooks**
Dunbar C. O. & Rodgers J. *Principles of Stratigraphy* Wiley

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**25.013**  
**Geology IIIA**  
F L3T3

**Prerequisites:** 25.012, 25.022.


**Laboratory:** Hand specimen study of ores and associated features; introductory mineralogy.

**Mineralogy & Petrology**


**Textbooks**
*Economic Geology A*
Park C. F. & MacDiarmid R. A. *Ore Deposits* 2nd ed Freeman
Stanton R. L. *Ore Petrology* McGraw-Hill

*Mineralogy & Petrology*

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**25.023**  
**Geology IIB**  
F L3T3

**Prerequisites:** 25.012, 25.022.

**Geophysics**

Global Geophysics: The physics, shape, structure and constitution of the earth: seismology, gravity, geology, geothermy, geomagnetism, palaeomagnetism, geo-electricity and geochronology. Geotectonics and geodynamics: geophysical expression and relation to geology and geochemistry. *Exploration Geophysics:* Introductory course in exploration geophysics covering the following methods: seismic, electrical, electromagnetic, gravity, magnetic and radioactive with applications mining, petroleum, engineering, hydrology and well logging.

**Stratigraphy & Palaeontology**


**Field Mapping**

Geological mapping in a complicated geological terrain with emphasis on stratigraphical and structural interpretation. Geological report writing and cartography.

A geological survey camp of 10 days’ duration is a compulsory part of the course.

**Textbooks**

*Geophysics*
Bott M. H. P. *The Interior of the Earth* Arnold
Dobrin M. B. *Geophysical Prospecting* McGraw-Hill

*Stratigraphy & Palaeontology*  
As for Stratigraphy and Palaeontology in 25.022 with: Krumbein W. C. & Stoob L. L. *Stratigraphy and Sedimentation* 2nd ed Freeman

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**25.033**  
**Geology IIC**  
F L6T6


**Mathematical Geology and Geological Surveying**

Mathematical Geology: An introduction to the mathematical techniques and concepts which may be applied to the analysis of geological data. Measurement scale, probability axioms, frequency analysis and basic geostatistics, sampling theory and techniques. FORTRAN computer programming forms a substantial part of the course with programming exercises in the analysis of map information and other geological data. Quantitative map interpretation with emphasis on trend surface analysis and automatic contouring techniques. *Geological Surveying* levels, tachometers and theodolites. Field techniques. Precision of angular measurements. Stadia surveying. Levelling. Field computations. Topographic maps.

**Geochemistry and Petrology**

Geochemistry: Some modern methods of rock and mineral analysis. Accuracy, precision and quality of geochemical data. The distribution

Advanced Structural Geology
Analysis of structural elements at the microscopic, mesoscopic and macroscopic scales. Modern methods of analysis, especially petrofabric analysis and A.V.A. Detailed studies of the analysis of metamorphic terrains, e.g. Otago Schists; Cooma Complex.

Sedimentary Basin Analysis and Geology of Hydrocarbons

Field Mapping and Remote Sensing
Field Mapping: Field mapping in a complex geological terrain, with concentration on the structural geology of deformed and metamorphosed sequences. Writing geological reports, and drafting geological maps. Remote Sensing: Exercises in the combined usage of air photos and ERTS imagery for the interpretation of regional and structural geology.

In addition, one of the following topics will be selected after consultation with the Head of School:

1. Economic Geology B, Mineragraphy, Experimental Petrology


2. Micropalaeontology

Morphology, stratigraphic distribution and significance of the principal microfossil groups: foraminifera, ostracoda, conodonts, spores and pollen, dinoflagellates, coccoliths and chitinozoa. Extraction techniques.

3. Surficial Geology


Problems of mapping Quaternary geology. Quaternary geology: methods of dating, sea level change, glacial geology of non-glaciated areas of Australia, especially the Riverine Plain. Quaternary sequences in Canada and Europe.

Field tutorials constitute and essential part of the course.

Textbooks
Mathematical Geology and Geological Surveying
Davis J. C. Statistics and Data Analysis in Geology Wiley
Blatt J. Introduction to FORTRAN Programming Prentice-Hall

Geochemistry and Petrology
Ahrens L. H. Distribution of the Elements in our Planet McGraw-Hill
Zussman J. Physical Methods in Determinative Mineralogy Academic
Loughman F. C. Chemical Weathering of the Silicate Minerals Elsevier
Miyashiro A. Metamorphism and Metamorphic Belts Allen & Unwin

Advanced Structural Geology
As for Geology II together with:

Sedimentary Basin Analysis and Geology of Hydrocarbons
As for Structural Geology II and Stratigraphy II & III together with:
Ager D. V. Principles of Palaeoecology McGraw-Hill

Economic Geology B, Mineragraphy and Experimental Petrology

Economic Geology of Australia I and II


Ehlers E. G. The Interpretation of Geological Phase Diagrams Freeman

Micropalaeontology
Glaessner M. F. Principles of Micropalaeontology MUP Hafner Reprint 1963

Surficial Geology
Hunt C. B. Geology of Soils, Their Evolution, Classification and Uses Freeman

Thornbury W. D. Principles of Geomorphology 2nd ed Wiley*

25.1333
Geology for Geographers III


Geological Surveying

Geochemistry

* Paperback.
Clay Mineralogy
The structures and properties of the clay mineral groups including the kandiles, illites, smectites, chlomites, mixed layered and fibrous clay minerals. Techniques for the identification of the clay minerals. Clay-water systems and ion exchange. Chemical weathering and the origin of the clay minerals.

Metamorphic Petrology

Practical
Macroscopic and microscopic study of igneous and metamorphic rocks.

Surficial Geology


Quaternary geology: methods of dating, sea level change, glacial sequences, surficial geology of non-glaciated areas of Australia, especially in the Riverine Plain. Quaternary sequences in Canada and Europe.

Field tutorials are an essential part of this course.

Textbooks

Geological Surveying

Geochemistry and Petrology
Ahrens L. H. Distribution of the Elements in our Planet McGraw-Hill
Zussman J. Physical Methods in Determinative Mineralogy Academic

Loughman F. C. Chemical Weathering of the Silicate Minerals Elsevier

Miyashiro A. Metamorphism and Metamorphic Belts Allen & Unwin

Surficial Geology
Hunt C. B. Geology of Soils, Their Evolution, Classification and Uses Freeman

Thornbury W. D. Principles of Geomorphology 2nd ed Wiley*

25.633A Hydrological Surveying S2 L1T2

Prerequisites: None. Co-requisites: 27.413A.


Field tutorials are an essential part of the course.

Textbook
Admiralty Manual of Hydrographic Surveying HMSO

25.643 Marine Geology S2 L3T3


Ocean Basin Stratigraphy
Sediment types and distribution. Principal index fossil groups and systems of correlation and stratigraphical classification.

Basin Analysis
Continental margins and basin evolution. Analysis of sedimentary and palaeological systems in fluvial, deltaic, near-shore and deep-water environments. Boundary structures of sedimentary basins.

Marine Seismic Interpretation
Practical methods of interpretation of seismic reflection profile records; characteristic sedimentary and structural features of ocean basins.

Field tutorials are an essential part of the course.

25.404 Geology IV Honours

A field assignment with appropriate work in the laboratory on material collected, the results of both the field and laboratory investigations to be presented in a graduation thesis. Advanced lectures, practical work and seminars. Short laboratory assignments on specific problems may be given.

Further details of the Honours course may be had from the Head of School.

Textbooks

Mining and Petroleum Geology
Lawrence L. J. Exploration and Mining Geology Aust. Inst Min Met Melbourne

* Paperback.
25.151  
**Geoscience IA**  
F L3T3

**Prerequisites:**

<table>
<thead>
<tr>
<th>HSC Exam Grade</th>
<th>Required</th>
</tr>
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<tbody>
<tr>
<td>1, 2 or 3</td>
<td>2 unit Science (any strands)</td>
</tr>
<tr>
<td>1, 2 or 3</td>
<td>4 unit Science (any strands)</td>
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</tbody>
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Excluded: 25.011.

For students who do not intend studying geology beyond first year, the first part during Session 1 is identical to the first part of 25.011 Geology I. But during Session 2 certain additional topics are presented, while others are treated in less depth than in 25.011 Geology I. No further units in Geoscience are available after this course.

**Physical Geology:** The origins, structure and main surface features of the earth. Geological cycle: processes of erosion, transportation, sedimentation and lithification. Surface and subsurface water. Weathering, lakes, rivers, glacial phenomena, geomorphology under different climatic regimes. Vulcanism, earthquakes, orogenesis and epeirogenesis. Outlines of plate tectonic theory in relation to continental drift and oceanography.

**Crystallography and Mineralogy:** Introduction to crystal symmetry, systems, forms, habit, twinning. Occurrence, form and physical properties of minerals. Basic structures of silicate minerals. Mineral classification. Descriptive mineralogy. Principal rock forming minerals.

**Petrology:** Field occurrence, lithological characteristics and structural relationships of igneous, sedimentary and metamorphic rocks. Introduction to coal, oil and ore deposits.

**Stratigraphy and Palaeontology:** Basic principles of stratigraphy, introductory palaeontology. The geological time scale. The geological history of the Australian continent and more specifically that of New South Wales in introductory outline.

**Practical Work:** Preparation and interpretation of geological maps and sections. Map reading and use of simple geological instruments. Study of simple crystal forms and symmetry. Identification and description of common minerals and rocks in hand specimen. Recognition and description of examples of important fossil groups. Supplemented by two half day and two full day field tutorials, attendance at all of which is compulsory.

**Textbooks**


Rutley F. *Rutley's Elements of Mineralogy*. Read H. H. ed Murby

Tyrrell G. W. *The Principles of Petrology*. Methuen

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25.613  
**Geological Oceanography**  
S1 L2T4

Prerequisite: 25.022.

The form and nature of ocean basins; the origin, transport and distribution of suspended matter, igneous and sedimentary rocks of the ocean floor and their distribution; the significance of oceanic igneous rocks, palaeontology, stratigraphical history and correlation of marine sedimentary rocks; magnetism and palaeomagnetism, tectonics of ocean basins.

**Compulsory field work** to be arranged.

**Textbook**

Gross M. G. *Oceanography*. Prentice-Hall

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**General Studies**

**Graduate Study**

For students enrolled in the MScSoc degree course

26.567  
**Interdisciplinary Seminars and Project**  
F L2

Chosen in consultation with the Program Co-ordinator, topics aim to exploit students' special interests.

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**Geography**

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**Undergraduate Study**

27.801  
**Introduction to Physical Geography**  
S1 L2T2½

The mechanism of the physical environment, with particular exemplification within the Sydney region. Geological controls of landform development; fluvial, slope and coastal processes and landforms; cyclic and equilibrium approaches to landform studies. The global radiation budget and atmospheric circulation; weather and climate in the Sydney region. The hydrologic cycle: Processes and factors of soil formation and the soil profile. Controls of vegetation in the Sydney region. The ecosystem.

Laboratory classes include: study and use of geologic and topographic maps and air photographs; use of climatic data and the weather map; soil description. Two field tutorials, equivalent to 16 tutorial hours, are a compulsory part of the course. Students must provide basic drawing equipment.

**Textbook**


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27.802  
**Introduction to Human Geography**  
S2 L2T2½

Problems of data, scale, distance and economic development. Development of human geography — traditions, approaches and basic problems, the human and natural environment. Spatial interaction including patterns of movement, gravity concept and diffusion. Pattern and structure of human activity: effect of level of economic development, man/land relationships and social and cultural factors on agriculture, manufacturing and tertiary services. Population — resources problem in context of economic development. Australian and South East Asian examples are used where relevant.
Laboratory classes in data presentation and description. Course involves a compulsory field excursion equivalent to eight tutorial hours.

Textbooks
Hammond R. & McCullagh P. S. Quantitative Techniques in Geography OUP
Hurst M. E. A Geography of Economic Behaviour Duxbury*

27.811 Physical Geography S2 L2T2½
Prerequisites: 27.801, 27.802, 27.813.


Laboratory classes: climatic analysis and mapping, and analysis of natural landscapes, including airphoto interpretation, together with appropriate statistical exercises.

Textbooks
Bridges E. M. World Soils CUP*
Riley D. & Young A. World Vegetation CUP*
Van Riper J. E. Man’s Physical World McGraw-Hill

27.812 Human Geography S2 L2T2½
Prerequisites: 27.801, 27.802, 27.813.

Spatial structure and social organisation in human geography with some emphasis on Australasia and South-East Asia. Pre-urban societies; urbanisation in underdeveloped and industrialized societies; the urban growth process; location, size and spacing of settlements; the economic and social structure of urban areas; geographical perspectives on urban problems.

Includes laboratory classes on relevant methodology applied to local examples and a compulsory field tutorial.

Textbooks
Kershaw K. A. Quantitative and Dynamic Plant Ecology 2nd ed Arnold
Odum E. P. Fundamentals of Ecology 3rd ed Saunders

27.103 Climatology S2 L2T3½
Prerequisites: 27.801 and 27.813 or 25.011, 1.001.

Components of the radiation and heat balance of the earth surface as affected by differing atmospheric, soil and surface cover conditions. Factors controlling evaporation and transpiration under freely-available and restricted water supply conditions, and methods for the measurement and estimation of evapotranspiration. Characteristic patterns of energy and water exchange for differing types of natural or man-modified land surface. Man’s modification of factors affecting the local climate in rural and urban settings. Climatic change.

Laboratory work is directed toward developing an appreciation of the operational principles and limitations of instruments commonly used in radiation and water balance studies. An introduction is given to the practical application of energy and water balance models for evaluation of the climatic environment as related to catchment hydrology, agricultural productivity and land resource management problems.

Textbook
Sellers W. D. Physical Climatology Chicago UP

27.203 Biogeography S1 L2T3
Prerequisites: 27.801 and 27.813 or 17.011 and 17.021.


Quantitative sampling, measurement and description of vegetation. Spatial distribution (pattern) of individual species. Association between species.


Fieldwork forms an integral part of the course.

Textbooks
Kershaw K. A. Quantitative and Dynamic Plant Ecology 2nd ed Arnold
Odum E. P. Fundamentals of Ecology 3rd ed Saunders

27.413 Geomorphology S1 L2T3
Prerequisites: 27.813 and 25.011 or 27.801 and 27.802.

Advanced work in selected areas of coastal and fluvial geomorphology. The characteristics of waves in deep and shallow water. Beaches and coastal barrier systems; lagoons and estuaries. Rock platforms. Quaternary sea-level changes. Drainage basin morphometry, hill-slope geometry and hydrology. Runoff and sediment yields and their controlling factors. Variations in geomorphic processes between regions; the impact of human activity. Field projects are undertaken in both coastal and fluvial components. Laboratory time is devoted to statistical exercises using data collected from maps, airphotos and in the field.

* Paperback.
27.423
Pedology S2 L2T3
Prerequisites: any two of 2.111, 2.121, 2.131 and 27.813, either 27.811 or 27.801, and 25.012 or 25.022. Excluded: 27.863.

History of Pedology. Morphological, physical and chemical properties of soil. Soil forming processes; rock weathering, silicate formation. Great Soil Groups; soil classification; soil-landscape relations and periodicity. Physical and chemical aspects of soil fertility; nutrient cycles; soil microbiology. Laboratory classes upon the measurement of soil properties; soil profile description; soil survey and mapping; analysis of soil maps. Up to five days field tutorials are an essential part of the course.

27.823
Urban Geography S1 L2T3
Prerequisites: 27.812, 27.813.

The geography of cities in the context of economic and cultural systems, social and political processes, and historical perspectives. Topics: foundations of urban geography; the city in underdeveloped countries and planned economies; the city as an ecosystem; distributions, problems and policies of urban size; growth centres and urban planning; interurban and intraurban movement and linkages; urban residential preferences and spatial differentiation; urban environmental quality and the perceived urban environment. Weekly seminars, and laboratory and fieldwork of a practical nature to include urban survey techniques.

27.840
Agricultural Geography S2 L2T3
Prerequisites: 27.812 and 27.813 or 53.204 or 51.542.

Physical, economic, political, and other cultural factors involved in origin and change of agricultural landscapes. Spatial patterns of agriculture as the result of individual and group decisions. Innovation diffusion as the process of farming change. Problems of agricultural modernization in South East Asia. Planning in rural areas, especially the impact on agriculture of competing land uses. Examples mainly drawn from Australasia.

Workshop/seminar classes include treatment of methods of inquiry into agricultural geographical problems and discussion of selected topics.

27.841
Population Geography S1 L2T3
Prerequisites: 27.812 and 27.813 or 53.204.

Population growth and contrasts in growth patterns between underdeveloped, modernizing and developed countries. Growth dynamics and their relation to physical and human resources. The demographic transition as a unifying theme. Population densities in urban and rural areas: case studies are drawn mainly from Western Europe, Southeast Asia and Australia. Social and economic factors in international and internal migration. Spatial interaction between the populations of rural areas and cities, and between cities. Fertility and mortality variations within and between regions, countries and cities. Urbanization of population. Stable and stationary population theory. World population problems. Workshop tutorials are concerned with session projects.

27.860
Landform Studies S1 L2T3
Prerequisites: 27.811, 27.813.

The study of landforms, with particular reference to Australian examples. Geomorphic regions. Planation surfaces and processes and associated weathering features. The evolutionary and dynamic approaches to landforms, with particular reference to fluvial landforms. Coastal processes and forms. Desert landforms. Landforms as evidence of climatic change.

Textbooks
Bird E. F. C. Coasts ANUP*
Mabbutt J. A. Desert Landforms ANUP*
Morisawa M. Streams, their Dynamics and Morphology McGraw-Hill*

27.862
Australian Environment and Land Resources S2 L2T3
Prerequisites: 27.811 and 27.813 or 25.011.

Regional patterns of natural land and water resources of Australia. Climatic, geomorphic, soil and biotic factors affecting past, present and potential modes of land use and stability of primary production. Conditions of the physical environment which favour or impede productive utilization and further development of land, marine, freshwater and energy resources under a changing technology. Problems of avoiding degradation of land quality and natural ecosystems. Case studies from distinctive environmental settings in Australia.

Laboratory/workshop sessions include the study of maps and air photographs of typical environments: local environmental problems are investigated in the field.

Textbook
CSIRO The Australian Environment MUP

* Paperback.
Soils, the Ecosystem and Man  S1 L2T3
Prerequisites: 27.811, 27.813. Excluded: 27.423.

Soils as an expression of endogenic and external factors and of physical and biological controls, and as a bridge between the physical environment and man's use of the land. Materials and properties of soils. Soils in the ecosystem, interrelationships between soil and climatic, biotic and geomorphic features of the environment. Constraints imposed by soil properties on land use, in both rural and urban settings. Man's effect on the soil, and its consequences. Cg. soil pollution, disturbance of soil-moisture and nutrient cycles, soil depletion and erosion.

These themes will be co-ordinated in the study of regional examples in Australia and South-East Asia. There are laboratory workshops, field excursions and group projects.

Textbooks
Fitzpatrick E. A. An Introduction to Soil Science Oliver & Boyd
Holmes J. Man and the Environment: Regional Perspectives Longman
Miller G. T Living in the Environment: Concepts, Problems and Alternatives Wadsworth

Urban Geography (Advanced)  S1 L3T3
Prerequisites: Graded passes in 27.812, 27.813 plus one other Upper Level unit in Geography.

As for 27.823 Urban Geography with additional and more advanced work.

Agricultural Geography (Advanced)  S2 L3T3
Prerequisites: Graded passes in 27.812, 27.813.

As for 27.840 Agricultural Geography with additional lecture/tutorials, especially relating to agricultural change in Australia.

Population Geography (Advanced)  S1 L3T3
Prerequisites: Graded passes in 27.812, 27.813.

As for 27.841 Population Geography with additional and more advanced work on techniques of spatial population analysis.

Landform Studies (Advanced)  S1 L3T3
Prerequisites: Graded passes in 27.811, 27.813.

As for 27.860 Landform Studies, with additional and more advanced work, including selected studies of geomorphic processes and of man's influence on those processes.
31.812 Optometry II


Textbooks
Aust W. The Conservative Management of Squint Karger
Bier N. Correction of Sub-Normal Vision 2nd ed Butterworths
Clayton G. H. Spectacle Frame Dispensing Assoc of Dispensing Opticians, London
Harrington D. O. The Visual Fields Mosby

31.813 Optometry III

Prerequisite: 31.812.


Textbooks
Bennett A. G. Optics of Contact Lenses Assoc of Dispensing Opticians
Mandel R. B. Contact Lenses Practice: Basic and Advanced Thomas

31.821 Special Anatomy and Physiology

Prerequisites: 17.011, 17.021. Co-requisite: 73.011A.


Textbooks
Moses R. A. Adler’s Physiology of the Eye Mosby
Wolff E. The Anatomy of the Eye and Orbit Lewis

31.831 Diseases of the Eye


Textbooks
Passmore R. & Robson J. S. eds A Composition to Medical Studies Vol. 2 Blackwell

31.841 Clinical Optometry

Prerequisite: 31.831.

Each student examines and prescribes for about fifteen patients per week. Special emphasis is placed on perimetry, aniseikonia studies, orthoptic diagnosis and treatment, reading deficiency diagnosis and treatment, and other advanced optometrical techniques. Each student keeps a detailed case book of all patients examined and treated, and conducts a number of visual surveys and visual job analyses; experience is also gained in the fitting of contact and corneal lenses on selected patients.
Graduate Study

31.701G
Advanced Clinical Optometry  F T4

Clinical work on selected patients, with special emphasis on advanced techniques and new developments. All areas of optometric 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
Pleoptics and Binocular Vision  F L2T2

An integrated subject, in which binocular vision and pleoptics 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

Contact lens materials: polymer chemistry, physical and chemical properties of soft and hard lens materials.

Contact lens design: the relationship of theoretical contact lens design and corneal topography. Clinical evaluation of current and new soft and hard lens designs.


Contact lens patient: Systems and techniques for evaluating contact lens patients; new techniques for patient instruction and management. Evaluation of patient response to lenses.

31.705G
Advanced Contact Lens Practice  F L1T3

The examination, evaluation and aftercare of contact lens patients.

31.706G
Occupational Optometry  F L2T2


31.707G
Clinical Photography  F L2T2


31.799G
Project

Biochemistry

Undergraduate Study

41.101
Introductory Biochemistry  S1 L4T8

Prerequisites: 17.021, and 2.12.1, 2.131. 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 molecular mechanism of gene expression and protein synthesis. Photosynthesis. Practical work to amplify the lecture course.

Textbook
Stryer L. *Biochemistry* Freeman

### 41.111 Biochemical Control S2 L2T4

*Prerequisite: 41.101.*

The relationship between structure and function of enzymes, hormones, vitamins and membranes. Metabolic networks and control mechanisms. Practical work to amplify the lecture course.

Textbooks
As for 41.101, plus

### 41.102A Biochemistry of Macromolecules S1 L3T9

*Prerequisites: 41.101, 2.002B.*


Textbooks
Scientific American *The Chemical Basis of Life. An Introduction to Molecular and Cell Biology* Freeman

### 41.102B Physiological Biochemistry S2 L3T9

*Prerequisites: 41.101, 2.002B.*


Textbooks
As for 41.102A above.

### 41.102C Plant Biochemistry S2 L2T4

*Prerequisites: 41.101, 2.002B.*

The biochemistry of the major pathways characteristic of plants will be studied: topics include the energetics and carbon path of photosynthesis, glyoxylate cycle, growth hormones and regulatory phenomena, nitrogen fixation and assimilation.

Experimental work to illustrate and amplify the course utilizes radioactive isotopes and a number of newer techniques.

Textbooks
No set texts. A reference booklist is provided by the School.

### 41.102D Biosynthesis of Plant Metabolites S2 L2T4

*Prerequisites: 41.101, 2.002B. Co-requisite: 41.102C.*

This unit complements 41.102C and is taken with it.

Topics: cell wall formation and the synthesis of mobilization of reserve materials; biosynthesis of amino acids, its regulation, and their conversion into non-protein materials, e.g. alkaloids and cyanogenetic glycosides; aromatic ring formation and the isoprene pathway as a source of rubber, steroids, carotenes and essential oils. Flower pigments and phytoalexins.

A combined practical with unit 41.102C illustrates and amplifies the course and includes a wide range of the latest techniques.

Textbooks
No set texts. A reference booklist is provided by the School.

### 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.

### Graduate Study

#### 41.999G Masters Qualifying Program

For students without an Honours degree or ineligible for the award of the BSc degree with honours. Full-time students follow a one year program similar to 41.103. Part-time students follow a two-year program selected according to educational background and experience.
Undergraduate Study

42.101 Introduction to Biotechnology S2 L2T4

Prerequisites*: 2.121, 2.131, 17.021, 10.011 or 10.001 or 10.021.

An introduction to biotechnology as a multidisciplinary subject, dealing with the application of biological systems in industry, agriculture and medicine. The application of the techniques and methodologies of mathematics, the physical sciences and engineering to the understanding and optimization of biological processes. An outline of the field and scope of biotechnology in relation to the development of microbial processes for the production of special chemicals such as antibiotics and enzymes and the production of single cell protein as an alternate protein source. The role of biotechnology in relation to pollution control and waste disposal. Biotechnological aspects of alternate energy sources. Likely contributions of biotechnology to the problems of developing countries.

The laboratory component emphasizes identification and manipulation of different classes of microorganisms (bacteria, fungi, algae) involved in traditional fermentations, industrial processes and waste treatment.

Textbooks
No set texts.

42.102A Biotechnology A S1 L2T4

Prerequisites*: 41.101 and 42.101 or 44.101.

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 parameters on batch and continuous flow cultivation, aeration and agitation; scale-up of microbial processes; air and media sterilization; the harvesting, purification and standardization of products. The principles involved in microbial processes for chemical, pharmaceutical and food production, microbial waste treatment and environmental control. The laboratory component includes manipulation of microorganisms, laboratory-scale fermenter operation, microbial enzyme isolation, visits to industrial fermentation plants and industrial seminars.

Textbooks
Aiba S., Humphrey A. E. & Millis N. Biochemical Engineering 2nd ed Academic
Pirt S. J. Principles of Microbe and Cell Cultivation Blackwells

42.102B Biotechnology B S2 L2T4

Prerequisite*: 42.101.

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.

Textbook
Aiba S., Humphrey A. E. & Millis N. Biochemical Engineering 2nd ed Academic

42.103 Biological Technology (Honours)

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

42.104 Graduate Seminars

42.114 Fermentation Processes

(Component topic of 22.114 Processes.) Factors governing the use of microorganisms in industrial processes, including the selection, maintenance and improvement of microorganisms, 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.

Graduate Study

42.111G Reading List in Biological Technology (Microbiology)

* In exceptional circumstances a student may apply to the Head of School for variation of prerequisite.
42.112G
Reading List in Biological Technology (Biochemistry)

42.211G
Principles of Biology SS L3
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 SS L3
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, \( \beta \)-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 SS T3
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 SS L2T1
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 involving 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.

42.301G
Microorganism Productivity SS L2T3
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.

42.302G
Enzyme Technology SS L2T3
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
Microbial Process Control SS L2T3
Fundamentals of process control, instrumentation and automatic control for microbial systems, an evaluation of mathematical modelling as a basis for microbial product optimization, analog computer modelling techniques, highly-instrumented fermentation equipment and on-line computer control.

Detailed models of microbial processes: organic acid production, antibiotics, enzymes, hydrocarbon fermentations, biological waste treatment, microbial leaching, mixed culture interactions, single and multistage continuous culture, simulation of enzyme reactors.

The practical component involves the collection of accurate kinetic data for a microbial system, the development of a model and the use of a model for on-line computer control.

42.304G
Biodeterioration and Biodegradation SS L2T3
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
SS L0T2
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
F L0T7
An experimental or technical investigation or design project in the general field of biotechnology with supporting seminars.

42.401G Chemical Transformations in the Environment
SS L2T0
The environment may be regarded as an array of dynamic chemical and physical systems which can be influenced by a wide variety of factors. Select topics illustrate some important aspects of environment: 1. microbial transformations of mineral and geochemical systems including the recovery of useful materials, control of metal pollution, recycling of inorganic wastes; 2. the chemistry of river and underground water systems; 3. the influence of new materials on the environment, including the effects of fungicides and other biocides.

Textbooks
No set texts.

42.999G Alternative Higher Degree Qualifying Program
Training similar in content and standard to 42.103 Biological Technology (Honours), but designed specifically for students who cannot regularly attend the University.

Botany

Undergraduate Study

43.101 Genetics
S2 L2T4
Prerequisites: 17.001 or 17.011 and 17.021.
Various aspects of molecular, organismal and population genetics, including: meiotic and non-meiotic recombination, genome variations, mutagens and mutation rates, cytoplasmic inheritance, gene function, genetic code, gene structure, collinearity of polynucleotide and polypeptide, control of gene action, genes and development, population genetics, genetics and improvement of plants and animals.

Textbook
Patt D. I. & Patt G. R. An Introduction to Modern Genetics Addison-Wesley

43.111 Flowering Plants
S1 L2T4
Prerequisites: 17.001 or 17.011 and 17.021.
The vegetative and floral morphology of Angiosperms with special reference to variations in morphology, elements of biological classification, nomenclature and identification of native plants. Weekend field work is part of the course.

Textbooks
Bell C. R. Plant Variation and Classification Wadsworth
Esau K. The Anatomy of Seed Plants Wiley

43.121 Plant Physiology
S2 L2T4
Prerequisites: 17.001 or 17.011 and 17.021, or two (2) units of: 2.111; 2.121; 2.131. Students may apply to the School for variations of the prerequisites.
The physiology of the whole plant including a consideration of photosynthesis, the role of phytochrome in plant morphogenesis and flowering, inorganic nutrition transport, translocation, physiology of growth and development, seed physiology and plant growth substances and their application in agriculture.

Textbooks
Galston A. W. & Davies P. J. Control Mechanisms in Plant Development Prentice-Hall
Richardson M. Translocation in Plants Arnold
Sutcliffe J. Plants and Water Arnold
Whittingham C. P. Photosynthesis OUP
43.131
Fungi and Man

Prerequisites: 17.001 or 17.011 and 17.021.

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.

Textbook
Talbot P. H. B. Principles of Fungal Taxonomy Macmillan

43.102
Advanced Genetics‡

Prerequisite: 43.101.

Students wishing to take this subject should request details from the School.

43.112
Plant Taxonomy†‡

Prerequisite: 43.111. Co-requisite: 43.101.

The assessment, analysis and presentation of data for classifying plants both at the specific and supra-specific level; the emphasis is on vascular plants. Field work is part of the course.

Textbooks*
Beadle N. C. W., Evans O. D. & Carolin R. C. Flora of the Sydney Region Reed
Heywood V. H. Plant Taxonomy The Institute of Biology's Studies in Botany No. 5 Arnold
Jeffrey C. An Introduction to Plant Taxonomy Churchill
Jeffrey C. Biological Nomenclature Arnold

43.122
Advanced Plant Physiology‡

Prerequisites: 41.101 or 41.101A and 41.101B, 41.121.

The physiology and biochemistry of plant lipids, with special reference to developing and germinating seeds, and of developing and ripening fruits. Project work is an important part of the course and some attendance is required outside the hours set down in the time-table. Reading and interpreting original scientific papers are an important part of these projects, which relate to current work in the fields covered.

43.132
Mycology and Plant Pathology‡

Prerequisite: 43.131. Students may apply to the School for variation of the prerequisite.

A detailed study of the fungi, including both saprophytic and plant pathogenic species. Includes: hyphal structure and ultrastructure; morphology and taxonomy of members of major taxonomic groups; spore liberation, dispersal, deposition, germination, infection and the establishment of 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.

Textbook

43.142
Environmental Botany‡

Prerequisites: 17.001 or 17.011 and 17.021; 1.001. Students may apply to the School for variation of the prerequisite.

The soil and atmospheric environments in which plants live and a study of the interaction of plants with their environment. Emphasis is placed on the role of environmental sciences in food production. Students are required to attend three week-day field excursions as part of the practical course.

43.152
Palaeoecology‡

Prerequisite: 43.111.

The evolution of the Australian flora from the Tertiary to the present; and the relationships between the present flora and those of neighbouring land masses. Includes an introduction to methods of palynology and palaeoclimatology, as well as numerical methods in phytogeography. A field camp is an integral part of this course.

Textbooks
No set texts.

43.162
The Plant Kingdom‡

Prerequisite: 43.111.

The major taxa of the Plant Kingdom with emphasis on the green plants. The evolution of basic vegetative structures, reproductive structures and genetic systems are studied. Field work will be part of the course.

Textbooks
Beadle N. C. W., Evans O. D. & Carolin R. C. Flora of the Sydney Region Reed
Morris I. An Introduction to the Algae Hutchinson
Sporne K. R. The Morphology of Angiosperms Hutchinson
Sporne K. R. The Morphology of Gymnosperms Hutchinson
Sporne K. R. The Morphology of Pteridophytes Hutchinson
Watson E. V. The Structure and Life of Bryophytes Hutchinson

* Students should consult lecturers in the course before purchasing textbooks.
† This unit alternates each year with 43.162 The Plant Kingdom. 43.162 The Plant Kingdom commences in 1977. If both units are to be included in three-year pass degree program, one should be completed in second year.
‡ These units may be taken in either second or third year of the Science course provided that prerequisites have been completed.
§ This unit alternates each year with 43.112 Taxonomy. This unit commences in 1977.
43.172
Phycolgy and Marine Botany
Prerequisite: 43.111.

The biology of freshwater, marine and soil algae with particular emphasis on the marine flora of S.E. Australia.

Textbooks
Prescott G. W. How to Know the Freshwater Algae 3rd ed Brown, Iowa
Chapman V. J. & D. J. The Algae 2nd ed Macmillan

43.182
Cellular and Developmental Physiology
Prerequisite: 43.121. This unit may be taken as a co-requisite in some circumstances.

The physiology, organization and interrelations of higher plant cells. Emphasis is placed on the interactions between plant cells and cellular events which control such processes as the regulation of growth and division, the perception of gravity by plants, secretion, seed germination and senescence.

Textbooks
As for 44.102 if not taking other Microbiology units. Otherwise:
Hawker L. E. & Linton A. H. eds Microorganisms: Function, Form and Environment Arnold
Davis B. D., Dulbeco R., Eisen H. N., Ginsberg H. S. & Wood W. B. Microbiology Complete 2nd ed Harper & Row

Level II Units

44.101
Introductory Microbiology
Prerequisites: 17.011, 17.021.

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.

Textbook
Brock T. D. Biology of Microorganisms 2nd ed Prentice-Hall

44.111
Microbiology
Prerequisite: 44.102.

Endeavours to relate the basic facts about microorganisms to a variety of practical conditions. The occurrence, importance, activity and control of microorganisms in soil, air, water and in their relationship with higher organisms (other than man); their industrial applications including manufacture, preservation and spoilage of food and dairy products. The nature of bacterial and fungal diseases of man, their cultural and serological diagnosis, epidemiology, treatment and prevention will be discussed in some detail.

Textbooks
As for 44.102.

44.122
Immunology
Prerequisites: 17.011, 17.021, 41.101 or 41.101A and 41.101B.

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 study.

These units may be taken in either second or third year of the Science course provided that prerequisites have been completed.
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.

Textbook
Roitt I. Essential Immunology Blackwell Scientific Publications

44.132 Virology  S2 L2T4
Prerequisite: 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.

Textbooks
As for 44.102.

Level IV (Honours) Units

44.513 General Microbiology
Microbial taxonomy, structure and function, physiology, ecology and genetics.

44.523 Applied Microbiology
Selected aspects of industrial microbiology including fermentation processes, food production and food spoilage, soil microbiology; pathogenesis of microorganisms and host resistance; diagnostic medical microbiology; chemotherapy, disinfection and sterilization.

44.533 Immunology
Phylogeny and ontogeny of the immune response, non-specific and specific immune mechanisms; hypersensitivity reactions; immunochemistry; diagnostic serology, immunoprophylaxis and therapy.

44.543 Virology
A detailed study of virus-host interactions based on examples of bacterial and animal viruses; virus genetics; epidemiology of virus diseases; diagnostic virology.

44.553 Electron Microscopy
The principles and practice of electron microscopic techniques.

44.563 Microbiology Project I
A supervised laboratory project of 150 hours duration designed to provide experience in a wide range of microbiological and immunological techniques and to introduce students to the general principles of research methodology, particularly at an applied level.

44.573 Microbiology Project II
A supervised laboratory project of 300 hours duration. While considerable emphasis will be given to acquiring technical competence in many microbiological or immunological techniques, the projects in this unit will provide greater scope for training in research methodology.

44.583 Microbiology Project III
A supervised laboratory project of 500 hours minimum duration. These projects provide training in research in fundamental aspects of microbiology or immunology, with special emphasis on the development and use of specialized techniques relevant to the particular field of study.

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Zoology†

Undergraduate Study

45.101 Biometry  S1 L2T4

Statistical methods and their application to biological data, including: introduction to probability; the binomial, poisson, negative binomial, normal distributions; student's t, $\chi^2$ 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 $\chi^2$, the Kruskal-Wallis test, Fisher's exact probability test and rank correlation methods.

45.201 Invertebrate Zoology  S2 L2T4
Prerequisites: 17.011, 17.021.

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.

† 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 has been completed.
45.301 Vertebrate Zoology S2 L2T4
Prerequisites: 17.011, 17.021.

A comparative study of the Chordata, 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.

Textbooks
Hildebrand M. Analysis of Vertebrate Structure Wiley
Alexander R. McN. The Chordates CUP

45.142 Developmental and Reproductive Biology S2 L2T4
Prerequisites: 45.201, 45.301.

Reproductive mechanisms, reproductive histology, reproductive endocrinology, and embryology, with particular reference to the comparative aspects in vertebrate species. Marsupial and monotreme reproduction.

Textbooks
Nalbandov A. V. Reproductive Physiology of Birds and Mammals 3rd ed Freeman

45.302 Vertebrate Zoogeography S2 L2T4
Prerequisite: 45.301. Co-requisites: 45.122 or 45.132 or 45.142.

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 man.

Textbook
No set texts. Use is made of the original literature and the principal references.
45.402
**Insect Structure and Classification**  
**S1 L2T4**

*Prerequisites: 17.011, 17.021.*

A comparative study of the internal anatomy and external morphology of insects. Classification and biometrics of major groups and families. A collection of insects is to be made. Practical work to include dissections, a study of mouthparts, wing venations, segmentation. Field excursions as arranged.

**Textbook**
CSIRO *The Insects of Australia* MUP

45.412
**Insect Physiology**  
**S1 L2T4**

*Prerequisite: 45.101. With special permission of the Head of School one of 10.321A, 10.311A, 10.331 may be substituted for 45.101. Co-requisite: 45.402.*

The functions of the various organ systems and of the whole insect. Various aspects of reproduction, growth and metabolism. Experimental work to illustrate the lecture course.

**Textbook**
Chapman P. F. *The Insects, Structure and Function* EUP

45.422
**Applied Entomology**  
**S2 L2T4**

*Prerequisite: 45.412.*

Fundamentals of insect control. Pest species and types of damage caused. Control by insecticides, physical and biological means. Insect toxicology. Insecticide resistance. Practical work to illustrate the above and also various aspects of bioassay in Entomology. Field excursions as arranged.

**Textbook**

45.432
**Project**  
**S2 L2T4**

*Prerequisite: 45.412.*

Selected aspects of insect physiology; ecology and toxicology. Treatment of topics in depth rather than breadth. Practical work illustrates the lectures and places emphasis on design and planning of experiments.

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**Philosophy**

**First Enrolment in Philosophy**

In Session 1, students normally take:
- 52.151 *Plato*
- 52.161 *Informal Logic*

which each have half-unit value.

In Session 2 they normally take two half-units chosen from:
- 52.152 *Hume*
- 52.162 *Formal Logic*
- 52.182 *Political Philosophy*
- 52.171 *Philosophy of Religion*

Students are required to indicate their Session 2 choice on their initial enrolment forms, but may make alterations later if they wish.

Students who do not take Philosophy in Session 1 may, however, still qualify for admission to Upper Level work by passing two or more Philosophy half-units in Session 2.

**Level II**

Students may not proceed to Level II work in Philosophy in their first year of study. Students in later years may proceed to Level II work after passing two Level I half-units in either session.

At Level II a wide range of half-units is offered, some dealing with particular philosophical topics and others capable of being taken in sequence to give more sustained treatments of larger areas. Students may select freely among these, subject to stipulations regarding prerequisites.

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.

A maximum of three units (six half-units) at Level II may be taken as part of the Science course, exclusive of General Studies. Additional units may, with permission, be substituted for a part of the General Studies requirement, in accordance with the provisions laid down in the General Studies Handbook.

Admission to the half-unit 52.423 Seminar A and 52.433 Seminar B, which are designed primarily for students intending to take Philosophy Honours in the Faculty of Arts, is by permission of the School normally based on a Credit Level performance in two or more Level II half-units already taken.

**Selection of Units**

The following details should assist students with their initial choice of half-units at Level II.

The half-units available in Session I having no prerequisite apart from Level I studies are:

- Predicate Logic
- Descartes
- British Empiricism
- Greek Philosophy: Thales to Plato
- Scientific Method
- Social and Political Philosophy

Of these, Predicate Logic is prerequisite to a range of advanced logic half-units, and Social and Political Philosophy caters in particular for those who wish to progress to other half-units in this area. Greek Philosophy: Thales to Plato is prerequisite to a later course on Plato. Descartes and British Empiricism are also prerequisites, alone or as
alternatives, to certain other half-units. Students who plan to take a full Philosophy major sequence will consequently need to consider what half-units they may wish to take later. Intending Honours students should expect to include Predicate Logic at some stage.

Provision is made for a full sequence of half-units in logic, namely, Predicate Logic, Set Theory, Model Theory and Foundations of Mathematics. The half-unit Argument caters for those with a less mathematically oriented interest in the subject.

Historical studies are catered for by the half-units: Greek Philosophy, Plato, Descartes, British Empiricism, Spinoza and Leibniz, History of Modern Logic, History of Traditional Logic, Logical Atomism, Wittgenstein, and Sartre, which can be arranged in sequences in various ways.

There are two half-units in the field of Ethics, namely Classical Ethical Theories, and Contemporary Ethics.

The half-units not so far mentioned deal with particular issues or philosophical views. They are: Philosophy of Psychology, Philosophy of Biology, Aesthetics, Philosophy of Perception, Privacy and Other Minds, and Oppression and Liberation. The half-units at Advanced Level consist of seminar courses on topics which vary from year to year based on recent articles in philosophical journals.

### Undergraduate Study

#### 52.151
**Plato**

**Prerequisite:** None.

Some dialogues of Plato with special reference to conceptions of the soul, and their implications for views on morals, politics, education and theory of knowledge.

**Textbook**

Plato *The Last Days of Socrates* Tredennick H. trans Penguin

#### 52.161
**Informal Logic**

**Prerequisite:** None.

An approach to logic by way of language, treating such topics as the uses of utterances, the truth and significance of conditions of statements, the non-formal analysis of arguments, and the logical relations of propositions. Illustrations and examples are drawn from Freud's *The Interpretation of Dreams*.

**Textbook**

Freud S. *The Interpretation of Dreams* Strachey J. trans Basic, or Avon paperback

#### 52.171
**Philosophy of Religion**

**Prerequisite:** None.

The philosophy of religion consists in the attempt to answer certain questions. Among these questions are the following: Can it be proved that God exists or proved that he does not? Are "God is benevolent" and "There is evil" incompatible in the sense that everyone who holds that both statements are true contradicts himself? Can we make sense of the notion of the survival of our own death? Are such statements as "God loves us" meaningful? and do they also express something either true or false as opposed to being merely an expression of our own feelings? These are just a selection from the questions that will be examined in this course. The course is conducted by seminars, lectures and tutorials and is assessed on the basis of essays.

**Textbook**

Weinberg J. R. & Yandell K. E. eds *Philosophy of Religion* Holt Rinehart Winston

#### 52.152
**Hume**

**Prerequisite:** None.

Some sections of Hume's *Enquiry*. Topics to be discussed may include: the miraculous and the existence of God, the mind-body problem and personal identity, the freedom of the will.

**Textbook**

Hume D. *On Human Nature and the Understanding* Flew A. ed Collier

#### 52.162
**Formal Logic**

**Prerequisite:** None.

An introduction to a system of natural deduction sufficient for the symbolization of such ordinary language arguments and the construction of such proofs as lie within the field of propositional logic and simple predicate logic.

**Textbook**

Kalish D. & Montague R. *Logic: Techniques of Formal Reasoning* Harcourt, Brace & World

#### 52.182
**Introduction to Political Philosophy**

**Prerequisite:** None.

Individuals live in social, or political, societies. These societies promote, protect and even create some rights and freedoms, limit others, and, perhaps, prohibit still others; and similarly for duties and obligations. Through the works of a number of historically central political philosophers — mainly Plato, Hobbes, Locke, Rousseau and Mill — this subject investigates the basis for the origin of political society, its various functions and its relation to the individuals within it.

**Textbooks**

To be advised.
**52.153 Predicate Logic**  
S1 L2T0  
*Prerequisite: 52.162.*

A system of natural deduction is presented for the first-order predicate calculus, including identity and definite descriptions. Emphasis is upon construction of formal derivations, methods of showing the invalidity of formal arguments, and the evaluation of informal arguments by symbolization.

**Textbook**
Kalish D. & Montague R. *Logic: Techniques of Formal Reasoning* Harcourt, Brace & World

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**52.163 Descartes**  
S1 L2T0  
*Prerequisite: Level II status in Philosophy.*

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 and his account of freedom.

**Textbook**
Anscome G. E. M. & Geach P. T. ed s *Descartes's Philosophical Writings* Nelson

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**52.173 British Empiricism**  
S1 L2T0  
*Prerequisite: Level II status in Philosophy.*

The empiricist tradition with special concentration on Locke and Berkeley.

**Textbooks**
Armstrong D. M. *Berkeley's Philosophical Writings* Collier*  
Locke J. *An Essay Concerning Human Understanding* Fontana

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**52.193 Scientific Method**  
S1 L2T0  
*Prerequisite: Level II status in Philosophy.*

The nature of empirical knowledge as exemplified in the physical and social sciences and in history, with emphasis on the concept of explanation, the nature of induction and scientific laws, counterfactual statements, and the paradoxes of confirmation.

**Textbooks**
Hempel C. G. *Philosophy of Natural Science* Prentice-Hall  
Ryan A. ed *Philosophy of Social Explanation* OUP

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**52.213 Sartre**  
S1 L2T0  
*Prerequisite: 52.492.*

Sartre's account of freedom, relations between persons and his social theory.

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**52.223 Foundations of Mathematics**  
S2 L2T0  
*Prerequisite: 52.153.*

A selection of problems concerning the foundations of Mathematics including the following topics: Non-Euclidean geometry and consistency proofs, Axiomatics, Antinomies of naive set theory, Logicism, Intuitionism, Formalism, Godel's incompleteness result.

**Textbook**
Wilder R. S. *An Introduction to the Foundations of Mathematics* Wiley

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**52.233 Argument**  
S2 L2T0  
*Prerequisite: Level II status in Philosophy.*

A theoretical study of practical argumentation in the courtroom, politics and everyday life as compared with argument in logic, mathematics and theoretical science. Confirmation and probability, authority, testimony, precedent; rules of debate; criteria of validity; problem of mechanization of practical arguments: logical rationalism and scepticism.

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**52.243 Logical Atomism**  
S2 L2T0  
*Prerequisite: Level II status in Philosophy.*

The logical atomism of Russell and Wittgenstein and the logical positivist movement.

**Textbooks**
Pears D. ed *Russell's Logical Atomism* Fontana  

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**52.253 Philosophy of Biology**  
S2 L2T0  
*Prerequisite: Level II status in Philosophy.*

Some of the problems associated with the philosophy of biology. Main consideration is the autonomy of biology; ie, whether biology is in principle reducible to the physical sciences and, ultimately, to physics, or whether the biologist necessarily employs types of description and explanation that have no application in the explanation and

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* Paperback.

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description of merely physical phenomena. No prior knowledge of biology is assumed but candidates are expected to familiarize themselves with the attitudes of various biologists to these issues.

Textbook
Nagel E. The Structure of Science Routledge

52.263 Philosophy of Psychology  S2 L2T0
Prerequisite: 52.193.
Some aspects of fundamental theory of psychology, with special emphasis on classical and contemporary behaviourism and behaviourist oriented psychology, and on the general conceptions of "behaviour" and "purpose"

Textbook
Fodor J. A. Psychological Explanation Random House

52.273 Aesthetics  S2 L2T0
Prerequisite: Level II status in Philosophy.**
The central concepts, types of judgment and theories occurring in the fields of aesthetics, art criticism and literary criticism.

Textbook
Rader M. ed A Modern Book of Aesthetics Holt Saunders

52.283 Philosophical Study of Woman  S2 L2T0
Prerequisite: 52.182 or 52.203 or 52.493.
Crucial structures involved in woman’s situation.

52.293 Plato’s Later Dialogues  S2 L2T0
Prerequisite: 52.483 (or, by permission, a course covering similar material).
Centred round some of Plato’s later dialogues, the Theaetetus and Sophist in particular.

Textbooks
Plato Theaetetus McDowell J. trans OUP
Plato Parmenides and other dialogues Warrington J. trans Everyman

52.303 Spinoza and Leibniz  S2 L2T0
Prerequisite: 52.163.
The main issues raised in the philosophy of the two great seventeenth century rationalists, with emphasis on the development of their metaphysical systems in response to unresolved problems in the philosophy of Descartes and to contemporary scientific thinking. Their ethical views.

Textbooks
Leibniz G. W. Philosophical Writings Parkinson G. H. R. ed Everyman
Spinoza B. Ethics and On the Improvement of the Understanding Both available in Works of Spinoza Elwes R. H. M. trans Dover

52.323 Set Theory  S1 L2T0
Prerequisite: 52.153 or 26.812 or 10.001 or 10.011 or 10.021.
An axiomatic development of Zermelo-Fraenkel set theory, including a construction of the natural numbers, equinumerosity, ordinal and cardinal numbers, the axiom of choice and some of its consequences.

Textbook
Suppes P. Axiomatic Set Theory Van Nostrand

52.343 Privacy and Other Minds  S1 L2T0
Prerequisites: 52.163, 52.173 or 52.243.
The questions: (a) whether there is anything that a person can know which it is logically impossible for anybody else to know; (b) whether it is logically possible that anybody should speak a language that cannot be understood by anybody else; and (c) how we come to understand another person’s mind.

Textbooks
Ayer A. J. The Problem of Knowledge Any ed
Strawson P. F. Individuals: An essay in Descriptive Metaphysics Methuen*

52.353 History of Modern Logic  S1 L2T0
Prerequisite: 52.153.
A historical treatment of selected topics in logic since Boole, with particular reference to Frege, Russell, Carnap and Quine.

Textbook
Kneale W. & M. The Development of Logic OUP

52.363 Wittgenstein  S1 L2T0
Prerequisite: 52.243.
Some themes in the later philosophy of Wittgenstein.

Textbooks
Coope C. et al A Wittgenstein Workbook Blackwell
Wittgenstein L. Philosophical Investigations Blackwell

* Paperback.
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52.373 Philosophical Foundations of Marx's Thought S2 L2TO

Prerequisite: 52.182 or 52.203 (may be waived, with permission, for students who have already studied political philosophy).

Marx's thoughts with special reference to philosophical issues, and philosophical origins.

52.383 Twentieth Century Marxist Philosophy S2

Prerequisites: 52.182 or 52.203 (may be waived, with permission, for students who have already studied political philosophy).

Selected twentieth century Marxist theorists with reference to philosophical problems in the fields of ethics, science, history and politics. Particular attention is paid to the debate on the nature and philosophical implications of the rediscovered Hegelian origins of Marxism from Lukacs and Korsch to Althusser. Other authors to be studied include Gramsci, Sartre and Marcuse.

52.393 History of Traditional Logic S2 L2TO

Prerequisite: 52.153.

A historical treatment of selected topics in logic before 1850, including the traditional theory of deduction; the rhetorical tradition; topics and fallacies; the medieval theory of terms; traditional treatment of modality; logic in India and China.

Textbook
Kneale W. & M. The Development of Logic OUP

52.403 Model Theory S2 L2TO

Prerequisite: 52.323 or 10.1123.

An introduction to the metamathematics of the predicate calculus from the point of view of model theory. Topics include: the deduction theorem, consistency, completeness, theories with equality, prenex normal forms, categoricity and second order theories.

Textbook
Mendelson E. Introduction to Mathematical Logic Van Nostrand

52.413 Reading Option S1 or S2

Admission by permission, to suitable students with good passes in at least two half-units at Level II.

A course of individually supervised reading and assignments on an approved topic not otherwise offered.

52.423 Seminar A S2 L0T2

Admission by permission, based on a credit record in Level II units.

A study of topics of contemporary interest mainly from selected journal articles. Students are expected to contribute papers.

52.433 Seminar B S1 L0T2

Admission by permission, based on a credit record in Level II units.

A study of topics of contemporary interest mainly from selected journal articles. Students are expected to contribute papers.

52.463 Introduction to Transformational Grammar S1 L2TO

Prerequisite: Any Level I unit.

Transformational grammar from the beginning: its history, goals, theory, and practice, emphasizing understanding and constructing arguments for one transformational system over another.

Textbook
Jacobs R. & Rosenbaum P. English Transformational Grammar Blaisdell

52.473 Semantics of Natural Language S2 L2TO

Prerequisite: 52.153 or 52.463.

Recent developments in that area which is of common concern of linguistics, logic and the philosophy of language. Topics: the goals of linguistic theory, the relevance of formal logic to natural language, and truth, meaning, and presupposition in natural language.

52.483 Plato's Theory of Forms S1 L2TO

Prerequisite: Level II status in Philosophy** (Not available to students who have taken a similar course at Level I).

Some dialogues of Plato, with special attention to Socratic definition and Plato's Theory of Forms.

Textbook
Plato The Last Days of Socrates Tredennick H. trans Penguin

52.493 Existentialism S1 L2TO

Prerequisite: Level II status in Philosophy**

Attempts to trace the historical origins of Existentialism, firstly by studying the ethical foundations in writings of Soren Kierkegaard and Friedrich Nietzsche, and secondly the epistemological foundations

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In Husserl's phenomenology, the confluence of these two streams in the writings of the French philosopher Jean-Paul Sartre is then examined and also the influence of existentialism on modern psychiatry and theology is discussed. The course is conducted by seminars and assessed by essays.

The Philosophy of Love

52.543 S1 L2T0

Prerequisite: 52.163 or 52.173 or 52.263.

Four main topics:
1. The distinction between eros and agape. This, together with the cognitive distinctions between desire and love and between lust and love, is considered with an emphasis on Plato, St Paul, St Augustine, St Thomas Aquinas, and Luther. Or, Lucretius and Freud are given secondary consideration in this section (Freud on genital and narcissistic love).
2. The relation between love and reason. This, together with the relation between love and will, is studied mainly in Plato, St Augustine, and St Thomas. Freud is given secondary consideration.
3. Union and separation. This is studied mainly in Plato, St Augustine, Plotinus. Secondary consideration is given to St Teresa, Hegel, McTaggart and Freud.
4. Courtly and romantic love. The main interest here lies in the attachment to the unattainable and it is treated in various texts from the troubadours to the modern novel and film.

Sociology

Graduate Study
For students enrolled in the MScSoc degree course

Science and Government I

53.306G S1 L2

The growth of government interest in science during the 20th century. Issues, institutions and policies. The nature and consequences of government support for research. The debate over the 'planning' of science. The arguments in favour of 'science policy'.

Science policy placed against the general background of the growth of government intervention in economic and social life during the last 100 years, leading to evaluation of the structure of modern government. The impacts of two world wars and the cold war'. Differences between countries in scientific organization and science policy.

Science and Government II

53.307G S2 L2

Continuation of 53.306G, dealing with specific issues, rather than the general issue of science and government. Includes the military role of science and technology, policies to promote industrial innovations, the role of science and technology in international affairs, scientific manpower and policies on natural resources.

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* May be waived with the consent of the lecturer.
History and Philosophy of Science

Undergraduate Study

62.012
The Origins of Modern Science  S1 L2T4

Prerequisites: A pass in four Level 1 units from Table 1 excluding Philosophy and Engineering units.

An introductory course dealing with the Scientific Revolution of the seventeenth century, the philosophical issues being discussed in their historical context. The course will survey the major achievements of science during the period, the consequences of the Copernican Revolution, the construction of dynamics from Galileo to Newton, Harvey's physiology, the development of theories of light and of concepts such as atmospheric pressure. The cultural and intellectual background of these achievements and their effects on European thought will be discussed.

Preliminary Reading
Butterfield H. The Origins of Modern Science Bell

Textbooks
Hall A. R. From Galileo to Newton 1603-1720 Collins
Westfall R. S. The Construction of Modern Science Wiley

62.022
The Social History of Science — From the French Revolution to the Second World War  S2 L3T3

Prerequisites: As for 62.012.

The development of the scientific movement, in its social and cultural context, from the French Revolution to the 1930s. Includes: consideration of the different national contexts of the scientific movement; its relations with the State, with the universities and other teaching institutions, and with the professions of medicine and engineering; the communications system in science and the nature and functions of scientific societies; the effects of science on technology and of technology on science; the institutionalization and professionalization of science.

Textbooks
No suitable textbooks are available. Reading lists, selections from primary sources, and other material are issued during the course.

62.032
The Scientific Theory  S2 L2T4

Prerequisites: As for 62.012.

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. Includes:

the principles of theory construction; perception and observation; the structure of scientific revolutions; scientific apologetics; the structure of theories; 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.

Textbooks
Darwin C. The Origins of Species Penguin
Hempel C. G. Philosophy of Natural Science Prentice-Hall
Kuhn T. S. The Structure of Scientific Revolutions 2nd ed Chicago UP
Popper K. R. The Logic of Scientific Discovery Harper Torchbook

62.013
History of the Philosophy of Science  F L2T1

Prerequisites: 62.012 or 62.022 or 62.032.

The development of ideas concerning the nature and methods of the sciences from 1700 to the present day. Descartes, Leibniz and continental rationalism; Bacon, Locke, Berkeley, Hume and British empiricism; Kant and Kantians; Herschel, Whewell, Mill and the revival of inductivism; Comte, Mach and nineteenth-century positivism; Peirce, James and pragmatism; Poincaré and conventionalism; Duerr and instrumentalism; Meyerson and realism; Einstein and the relativists; Eddington's selective subjectivism; Bridgman and operationalism; the Vienna Circle and logical positivism; Carnap and positivist reductionism; the philosophical ancestry of some leading contemporary philosophers of science.

Preliminary reading
Losee J. A. A Historical Introduction to the Philosophy of Science OUP

Textbooks
No suitable textbooks are available. Students should buy some primary sources and will be advised in class re selection.

62.023
The Rise of Environmentalism  S1 L3T3

Prerequisites: 62.012 or 62.022 or 62.032.

Environmentalism is a very scientific issue and also a very political one. The course aims to put it in historical perspective as a major element in the contemporary social history of science. The concept of the Environmental Revolution of 1968-1972 (a revolution in consciousness and perception on the part of society generally) is used as an organizing concept and the course begins with various developments in the period before 1968 that can be regarded as leading towards it (notably the conservation movement, the development of ecology and other environmental sciences, the fallout episode of 1954-1963, the beginnings of the pesticides issue, and the growing awareness of environmental deterioration). After a discussion of the Environmental Revolution — including the institutional aspects, national and international — the course concludes with an examination of developments since 1972.

Textbooks
No set texts. Reading lists and other materials are issued during the year.
62.033  The Development of Theories of Matter  S1 L3T3

Prerequisites: 62.012 or 62.022 or 62.032.

Review of early theories; the development of man's ideas about the nature of matter up to the mid-twentieth century. Stress on the development of the atomic and quantum theories; ideas concerning chemical bonding and structure, the evolution of the cell theory, and the application of chemical ideas to biological problems. Emphasis is laid on the relationships between work in the chemical, physical and biological sciences.

Textbooks
Crosland M. P.  The Science of Matter  Penguin
Toulmin S. E. & Goodfield J.  The Architecture of Matter  Pelican

62.043  The Historical Foundations of Experimental Biology  S1 L2T4

Prerequisites: 62.012 or 62.022 or 62.032.

The development of experimental biology from the work of Vesalius in the mid-sixteenth century to that of Bernard in the mid-nineteenth century, with special emphasis on the development of physiology. Includes: the Vesalian tradition; the work of Harvey, with special reference to the circulation of the blood and the functioning of the heart; Descartes and the mechanization of biology; Malpighi, Hooke and early microscopy; Hales and plant physiology; theories of animal heat and respiration; the work of Haller, Bichat, Magendie and Bernard on animal physiology.

Textbooks
No set texts.

62.053  The History of Theories of Generation and Heredity  S2 L2T4

Prerequisites: 62.012 or 62.022 or 62.032.

The development of theories relating to generation and heredity, with special reference to the interplay of scientific, social and ideological factors. Largely concerned with the period from 1830 to 1930. Includes: the cell theory; sexual and asexual reproduction; embryology; the theory of spontaneous generation and its overthrow; Mendel and his predecessors; the rise of classical genetics and the background to the Synthetic Theory of evolution; molecular biology and DNA.

Textbooks
No set texts.

62.063  History and Philosophy of Cosmology  S2 L2T4

Prerequisites: 62.012 or 62.022 or 62.032.

The main formative influences that have shaped the science of cosmology. The work of investigators such as Wright, Kant and Herschel on the Milky Way, which followed from the work of Galileo and Newton on motion and gravitation. The implications of the researches of Olbers and Hubble for an expanding universe. The conceptual and observational framework of the present situation in cosmology and cosmogony; central physical-philosophical problems raised by various models of the universe concerning space and time, matter and radiation. Problems which have their parallels in the mathematical astronomy of the Greeks, and the beginnings of modern cosmology following upon the Copernican revolution.

62.073  Predicate Logic and the Foundations of Mathematics  F L2T1

Prerequisite: 52.162 or prescribed reading preceding long vacation.

(Offersd by the School of Philosophy.)

Predicate Logic
A system of natural deduction for the first order predicate calculus, including identity and definite descriptions. Emphasis is upon construction of formal derivations, methods of showing the invalidity of formal arguments, and the evaluation of informal arguments by symbolization.

Textbook
Kalish D. & Montague R.  Logic: Techniques of Formal Reasoning  Harcourt, Brace & World

Foundations of Mathematics
An introduction to a selection of problems concerning the foundations of Mathematics, including non-Euclidean geometry and consistency proofs, axiomatics, antinomies of naive set theory, logicism, intuitionism, formalism, Gödel's incompleteness result.

Textbook
Wilder R. S.  An Introduction to the Foundations of Mathematics  Wiley

62.083  Marxism and Science  F L0T3

Prerequisite: 62.032.

A course of weekly seminars and directed readings on Marxism and science. Includes: Marxist interpretations of scientific knowledge and its development, the claims of Marxism to be a science and the critique of non-Marxist philosophies of science, the nature and function of ideology in relation to scientific knowledge, and the requirements of a Marxist historiography of science; with the relative emphasis among these topics to be determined according to the interests of the class.

62.093  Science and the Strategy of War and Peace  F L1T2

Prerequisites: 62.012 or 62.022 or 62.032.

Aims to give historical perspective to the impact of science and technology on the art of war from Leonardo da Vinci to contemporary problems of nuclear disarmament and the arms race. Emphasis on the intellectual challenges, social consequences and moral dilemmas posed by twentieth century developments in the mechanization of warfare, communications, surveillance and physical, chemical, nuclear.
and biological weaponry; the early history of the atomic scientists and the nuclear age; Einstein and Russell and the anti-war movements; the role of the military industrial complex; the dynamics of the arms race and its limitation; the technological elaboration of armaments in the 1960s; the opportunity cost of military expenditure.

Textbooks
No set texts. Extracts from source material and journal articles are issued.

Graduate Study

62.701G Philosophy and Methodology of Science* S1 L2
An introduction to some current and fundamental problems in the philosophy of science and society; the nature of scientific debates and forms of argument; the function of 'scientific' images in the exploration and conquest of man and nature; scientific understanding and explanations in terms of models, analogies and laws of nature; problems of creativity and logic in the construction, establishment, acceptance and rejection of theories; the dynamics of scientific development and change; the concept of scientific revolutions.

62.702G Logic and Strategy of Scientific Progress* S2 L2
Theories of scientific rationality, ideology and knowledge and their application to the intellectual and social improvement of mankind from Francis Bacon to Marx, Popper, Kuhn, Lakatos, Ravetz and Easlea.

62.703G Technology and Society in the Twentieth Century* S1 L2
A discussion on a historical ground plan, of the inter-relations between technology and society. Review of the main lines of development of technology in the twentieth century; case studies referring to such issues as: the opposed claims of technological determinism and social determinism; relations between technology and politics; the social mechanisms of the transfer of technology; the 'spin off' from military and space technology; the role of technology in the developing countries and the issue of appropriate technology; recent developments in pollution control technology and alternative energy sources.

62.704G Science, Technology, and Social Responsibility* S2 L2
Concern about the social responsibility of science-based technology first appeared to a significant extent in 1945 among scientists involved in the development of nuclear weapons and was for a long time largely restricted to them. Since the late 1960s however the 'cultural revolution' triggered by the Vietnam War and the widespread reaction against science and technology have obliged scientists generally to come to terms with the issue and in some cases to engage in social and political action.

Discussion of the historical setting of the issue, subsequently explored through examination of a number of particular cases.

62.705G Science and the Military-Industrial Complex I* S1 L2
An introduction to the developing interrelations and mutual dependencies of the scientific community and its institutions, scientific research and development and innovation, and the military and industrial communities in the twentieth century. Case studies used to examine national attempts to integrate civilian and defence resources, priorities and policies, the unification of research and development activities, and the power and influence of the 'military-industrial' complex.

62.706G Science and the Military-Industrial Complex II* S2 L2
Continuation of 62.705G. A critical study of the intellectual challenges, social and political consequences, opportunity costs and moral dilemmas posed by the association of the 'military-scientific' complex with technological developments in the mechanization of warfare, communications, surveillance and physical, chemical, biological and nuclear weaponry.

Board of Studies in Science and Mathematics

Undergraduate Study

68.302 Introductory Marine Science S1 L3T1
Ocean basins, sediments, properties of seawater, ocean circulation, coasts and coastal processes. Marine biology and ecology, primary and secondary productivity.

Textbook
Gross M. G. Oceanography, A View of the Earth Prentice-Hall

* For students enrolled in the MScSoc degree course.
Sciences

Anatomy

Undergraduate Study

70.011A
Histology I

Prerequisites: 17.011, 17.021.


Textbooks
Ham A. W. Histology 7th ed Lippincott
or

70.011B
Mammalian Embryology

Prerequisites: 17.011, 17.021.


Textbook
Arey L. B. Developmental Anatomy 7th ed Saunders

70.011C
Introductory Anatomy

Prerequisites: 17.011, 17.021.

Introduction to gross anatomy, based on a study of prosected specimens. Musculoskeletal, cardiovascular, respiratory, gastrointestinal, genitourinary and nervous systems. General topographical and surface anatomy. Normal variations including those related to sex and age (childhood, adolescence, maturity, senescence).

Textbook
Basmajian J. V. Primary Anatomy 6th ed Williams & Wilkins
or
Jacob S. W. & Francone C. A. Structure and Function in Man 3rd ed Saunders

70.012A
Musculoskeletal Anatomy

Prerequisites: 70.011A, 70.011C.

The topographical anatomy of the limbs and the musculoskeletal framework of the trunk. Distribution of nerves and vessels. Living and radiological anatomy.

Textbook
Basmajian J. V. Primary Anatomy 6th ed Williams & Wilkins
or
Gardner E., Gray D. J. & O’Rahilly R. Anatomy Saunders

70.012B
Visceral Anatomy

Prerequisites: 70.011A, 70.011C.

The topographical anatomy of the great visceral systems — gastrointestinal, respiratory, cardiovascular, and genitourinary — and of the head and neck. Living and radiological anatomy.

Textbook
Basmajian J. V. Primary Anatomy 6th ed Williams & Wilkins
or
Gardner E., Gray D. J. & O’Rahilly R. Anatomy Saunders

70.012C
Neuroanatomy

Prerequisites: 70.011A, 70.011C.


Textbook
Barr M. L. The Human Nervous System: An Anatomical Approach Harper & Row

70.303
Kinesiology

Prerequisites: 70.012A, 70.012C.

Study of movement in vertebrates. Kinesiological recording, anatomical factors affecting movement, mechanics of posture and locomotion, comparative vertebrate locomotion, development and organization of movement in the human, the facilitation of movement.

Textbooks
No set texts. A list of reading material is provided.
70.304 Histology II  S2 L2T4
Prerequisite: 70.011A.


Textbooks
Disbry B. D. & Ruck J. H. Histological Laboratory Methods Churchill Livingstone
Bancroft J. D. An Introduction to Histochemical Techniques 2nd ed Butterworths
and either
Bloom W. & Fawcett D. W. A Textbook of Histology Saunders
or
Ham A. W. A Textbook of Histology Lippincott

Physiology and Pharmacology

Undergraduate Study

73.011A Principles of Physiology  F L2T4
Prerequisites: 2.121, 2.131, 10.001 or 10.011 or 10.021, 17.011, 17.021.

Generally taken in the second year of the science course by a number of groups of students, including physiotherapy and optometry students as well as those intending to major in physiology. 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, e.g. 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.

Textbook

73.012 Physiology II  F L4T8
Prerequisites: 73.011A, 41.101, 41.111.

A major subject offered in third year, providing a more advanced course of study concentrating on a number of specific areas of physiological study, e.g. circulation, respiration, the biophysics of cell membranes, neurophysiology and endocrinology.

Textbook
Mountcastle V. B. Medical Physiology 13th ed Mosby

In both subjects, Principles of Physiology and Physiology II, students spend considerable time performing laboratory experiments which illustrate various physiological principles and introduce students to the techniques used in physiological investigation.

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 an honours degree in Physiology. This would usually be done by students planning a career in physiology. 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 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 an MSc or PhD degree may also be undertaken by selected students.

Community Medicine

Undergraduate Study

79.201 Population Genetics Theory  S1 L2T3
Prerequisites: 45.101 or 10.311A and 10.31B or 10.321B or 10.331.

Models of genetic systems and growth of populations, with essential mathematical and statistical theory; illustrated by examples from human genetics. Limitations of models.

Models of population growth in discrete and continuous time with nonoverlapping and overlapping generations. An extension of the Hardy-Weinberg principle to finite populations and several loci. The concept of inbreeding, calculation of coefficients of consanguinity, effects of inbreeding, effective population number. Fisher's Fundamental Theorem of Natural Selection. Advanced treatment of factors maintaining gene frequency equilibria in populations, including balance between mutation and selection, heterozygotic advantage, and genetic loads. Effects of finite population number, including random gene frequency drift.

Textbook
79.202
Quantitative Methods in Human Genetics  S2 L2T3

Prerequisites: 43.101, 10.311A and 10.311B, or 10.321A and 10.321B or 10.331 or 12.152 or 45.101.

Application of the principles of genetics and the theory of statistics to the study of human populations.

Estimates of population parameters, uses of measures of relatedness, discrimination between models of inheritance, design and analysis of surveys of families and twin pairs, genetic models of qualitative and quantitative variation, use of probability models in genetic counselling and determining effects of medical intervention.

Textbook
No set texts. A list of references is provided.

79.302
Biochemical Genetics of Man  S2 L2T4

Prerequisites: 43.101, 41.101.

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.

Textbooks
No set texts.
The University of New South Wales
Kensington Campus 1977

Buildings
Applied Science F10
Architecture H14
Banks F22
Basser College C18
Biological Sciences D26
Biomedical Lecture Theatres E27
Central Lecture Block E19
Central Store B13
Chancellery C22
Civil Engineering H20
Classroom Block H3
Dalton (Chemistry) F12
Electrical Engineering G17
Electrical Engineering Theatre F17
Goldstein College D16
Golf House A27
Gymnasium B5
House at Pooh Corner N8
International House C6
John Goodsell (Commerce) F20
Keith Burrows Lecture Theatre H14
Kensington Colleges G17
Main Building K15
Maintenance Workshop B13
Mechanical and Industrial Engineering J17
Medicine (Administration) B27
Menzies Library E21
Metallurgy E8
Morven Brown (Arts) C20
New College (Anglican) L6
Newton J12
Old Main Theatre J14
Parade Theatre E3
Parking Station H25
Philip Baxter College D14
Robert Heffron (Chemistry) E12
Sam Cracknell Pavilion H8
Sciences F23
Sciences Lecture Theatre Block D23
Science Theatre F13
Shalom College (Jewish) N9
Sir John Clancy Auditorium C24
Sir Robert Webster (Textile Technology) G14
Squash Courts B7
Unisearch House L5
University Regiment J2
University Union (Roundhouse) — Stage I E6
University Union (Blockhouse) — Stage II G6
University Union (Squarehouse) — Stage III E4
Wallace Wurth School of Medicine C27
Warrane College (Roman Catholic) M7
Wool and Pastoral Sciences B8

Centre for Medical Education
Research and Development F24
Chemical Engineering F10
Chemical Technology F10
Chemistry E12
Child Minding Centre N8
Civil Engineering H20
Closed Circuit Television Centre F19
Commerce (Faculty Office) F20
Community Medicine E25
Computer Services Unit F21
Drama D9
Economics F20
Education G1
Electrical Engineering G17
Engineering (Faculty Office) K17
English C19
Examinations and Student Records B22
Fees Office B23
Food Technology F10
French C20
General Studies C20
Geography K17
German C20
Health Administration C22
History C20
History and Philosophy of Science C19
Industrial Arts B1
Industrial Engineering J17
Institute of Administration G2
Institute of Languages G14
Institute of Rural Technology B8
Law (Faculty Office) F21
Law Library F21
Librarianship B10
Library E21
Marketing F19
Mathematics F23
Mechanical Engineering J17
Medicine (Faculty Office) B27
Metallurgy E8
Microbiology D26
Mining Engineering K15
Music B11
National Institute of Dramatic Art C15
Nuclear Engineering F18
Optometry H12
Pathology C27
Patrol and Cleaning Services F20
Philosophy C20
Physics K13
Physical Education and Recreation Centre (PERC), see Gymnasium and Squash Courts
Physiology and Pharmacology C27
Political Science C19
Postgraduate Committee in Medical Education B27
Postgraduate Extension Studies (Closed Circuit Television) F19
Postgraduate Extension Studies (Radio Station and Administration) F23
Psychology F23
Public Affairs Unit C23
Regional Teacher Training Centre F24
Russian D20
Science (Faculty Office) K14
Social Work F1
Sociology C20
Spanish and Latin American Studies D19
Student Amenities and Recreation E15
Student Counselling and Research E16
Student Employment C22
Student Health E15
Students' Union E4
Surveysing H20
Teachers' College Liaison Office F16
Tertiary Education Research Centre E16
Textile Technology G14
Town Planning K15
University Union G6
Wool and Pastoral Sciences B8
Zoology D26