FACULTY OF SCIENCE
HANDBOOK

CALENDAR
1987

Volume 10
THE DEAN'S FOREWORD

To those students who are joining us in the Faculty of Science for the first time we say 'welcome'; to those students returning after one or more earlier years, we say 'welcome back'. To both groups we extend the wish that you enjoy the social and academic aspects of your time at University and that you will emerge at some future date with an academic qualification and with pleasant memories and firm friendships to build on, into the future.

It is unfortunate perhaps that many students will enter the University with the idea that these years at University are for training in a specific job or profession. In some Faculties outside pressure will reinforce this attitude through the discipline imposed on the subject matter to be taught and assimilated. Within the Faculty of Science I hope you will have some freedom to explore many areas of Science in general, while at the same time expanding your knowledge in the area of your chosen specialisation. The aim of a University should be to ensure you are fully equipped to make the most of all available resources, when exploring a given topic. You cannot expect the Faculty and its Departments to provide you with all the information you will need on a given topic. You will have to make efficient use of alternative resources such as the Library or nominated texts.

Our society today is a complex one, dependent on very advanced technologies which most people will never attempt to fully understand. At the University as a science student, you will be given the opportunity to explore the basic concepts relating to and part of those technologies. I hope you make the most of those opportunities, approaching each area with an open mind and a desire for knowledge. In the future you will be called upon to make value judgements regarding the interaction of those technologies and the community. As a scientist, you must learn to decide and advise on the basis of assessed fact, rather than biased emotions. The future of a large part of our society may depend in the main on your correct judgement.

During your time with us, the chances will be high that you will have some problems of an academic or personal nature which will affect your performance. The Faculty and the University has people to help and advise in these circumstances. You must learn to regard those people as a resource as well, and use them to help you in your quest for your degree.

Finally learn to balance your social and academic life. Life in the secondary school has prepared you very poorly for your time with us. You must learn to work consistently throughout the year, but do not neglect the social opportunities available during your stay here. A proper balance of activity will enhance your results; too much emphasis on either aspect may cause you unnecessary trouble during that stay.

R. J. MacDonald,
Dean,
Faculty of Science.
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Mathematics, Statistics & Computer Science

Note: As from 1 January, 1987, this Department will be replaced by the three separate Departments of Computer Science, of Mathematics and of Statistics. Students should consult the relevant Departments for advice regarding subjects.

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GENERAL INFORMATION
The Faculty of Science comprises the Departments of Biological Sciences, Chemistry, Geology, Physics and Psychology. The Departments of Geography and Mathematics, Statistics & Computer Science also offer major sequences of qualifying subjects for the degree of Bachelor of Science in the Faculty of Science.

FACULTY BOARD, FACULTY OF SCIENCE
The Faculty Board, Faculty of Science, consists of the Professors, Associate Professors, Readers, Senior Lecturers, Lecturers, Senior Tutors/Demonstrators and Tutors/Demonstrators of the Departments composing the Faculty together with the following representatives of the Departments offering services to the Faculty, as determined by Senate:

- six members from the Department of Geography;
- six members from the Department of Mathematics, Statistics & Computer Science;
- two members from the Faculty of Engineering;
- two members from the Faculty of Arts;
- one member from the Department of Chemical and Materials Engineering;
- one member from the Department of Education;
- two members from the Faculty of Medicine; and
- four student members elected from the Faculty of Science.

The Role of the Faculty Board is defined by By-law 2.4.4:

"Subject to the authority of the Council and the Senate and to any resolution thereof, a Faculty Board shall:

(a) encourage and supervise the teaching and research activities of the Faculty;
(b) determine the nature and extent of examining in the subjects in the courses of study for the degrees and diplomas in the Faculty;
(c) determine the grades of pass to be awarded and the conditions for granting deferred or special examinations in respect of the subjects in the courses of study for the degrees and diplomas in the Faculty;
(d) determine matters concerning admissions, enrolment and progression in the courses of study for the degrees and diplomas in the Faculty and make recommendations on such of those matters as require consideration by the Admissions Committee;
(e) consider the examination results recommended in respect of each of the candidates for the degrees and diplomas in the Faculty and take action in accordance with the Examination Regulations made by the Council under By-law 5.9.1;
(f) deal with any matter referred to it by the Senate;
(g) make recommendations to the Senate on any matter affecting the Faculty;
(h) exercise such other powers and duties as may from time to time be delegated to it by the Council."
INFORMATION FOR UNDERGRADUATES

Students may choose subjects from the Departments of Geology, Physics, Chemistry, Biological Sciences, Psychology, Geography and Mathematics, Statistics and Computer Science. A candidate for the degree of Bachelor of Science is, in general, permitted to enrol in one subject from among those offered by another Faculty. In very exceptional circumstances a student may enrol in up to three subjects from another Faculty to be counted towards the degree of Bachelor of Science. A candidate for the degree of Bachelor of Science (Psychology) may, with the permission of the Dean, count up to two subjects offered in other degree courses in the University.

PROFESSIONAL EMPLOYMENT AND PROFESSIONAL RECOGNITION

Geology

For employment as a geologist students must have at least an ordinary BSc degree but preferably an honours degree.

There are three professional organisations which graduates in geology may join — the Geological Society of Australia, Inc., the Australian Institute of Geoscientists and The Australasian Institute of Mining & Metallurgy which has several categories of membership according to qualifications and experience.

The Australian Institute of Mining & Metallurgy has a code of ethics for professional behaviour to which members are expected to adhere. The Institute has foreshadowed that from 1992, Corporate Membership (Member or Fellow) of the Institute will require the basic qualifications of a degree or diploma involving four years of full-time (or equivalent part-time) study. Students who embark on a three-year course in 1984 or later are advised that this will not provide immediate eligibility for corporate membership and that a further year of formal study will be necessary.

The Australian Institute of Geoscientists is a newly formed professional body charged with enhancing the status and welfare of geoscientists in Australia. It also has categories of membership based upon qualifications and experience.

The Geological Society is currently working with the various State Governments and Federal Government to bring about legislation to provide for the registration of geologists.

Psychology

The Australian Psychological Society is the professional organisation of psychologists in this country. The objects of the Society are the advancement and diffusion of a knowledge of psychology and especially the promotion of the professional standing of its members by setting up a high standard of training and conduct, and by requiring the observance of rules of professional conduct.

There are two categories of membership in the Australian Psychological Society — Fellowship and Membership. Provision is also made for Student Subscribers and Affiliates. Membership normally requires a four year degree in psychology.

THE UNIVERSITY OF NEWCASTLE PSYCHOLOGY STUDENTS' ASSOCIATION

The Association is open to all interested students of Psychology at a nominal cost of 50c annually. Members meet regularly to see films, hear recordings and to listen to speakers on a wide variety of topics. In addition, an important object of the Association listed in the Constitution is — "To provide regular opportunities for social contacts among Psychology students, and Psychology students and staff."

You may join by leaving your name, address and telephone number with the Student Enquiries Office of the Department of Psychology (Room W204).

SUBJECT TIMETABLE CLASHES

Students are strongly advised to check on possible timetable clashes before enrolling. Clashes may force students to take those subjects in different years. Although academic staff are always willing to advise students, it is the student's responsibility to ensure that chosen subjects may be studied concurrently. To help in this matter the following table of existing clashes has been compiled for Science Faculty subjects in 1987. However, Science students taking subjects from other faculties must examine the timetable to ensure that clashes do not exist in their proposed courses.

| Biology II with (some topics) | Geology IIA | Geology IIB |
| Chemistry IIIA, Geology IIA | Mathematics III (some topics) |
| Chemistry IIIB with (some topics) | Geology IIB | Mathematics III (some topics) |
| Chemistry IIIA with | Geology IIA | Geology IIB |
| Mathematics III (some topics) |
| Chemistry IIIB with | Biology III (some topics) | Biology I (some topics) |
| Mathematics III (some topics) |
| Chemistry IIIA with | Chemistry IIIB | Biology III |
| Mathematics III (some topics) |
| Mathematics II with (some topics only) | Psychology IIB |
| Physics IIA |
| Physics IIIA |
| Chemistry IIIB |
| Biology III |
| Physics |
| Physics IIIA with | Biology III (some topics) | Chemistry IIIB |
| Geology IIB |
| Mathematics III (some topics) |
advised of the following advisory prerequisites:

Chemistry I
Geology I
Physics

N.B. Although the timetable for one particular subject may clash with that of another, this may not necessarily mean that this combination cannot be done. Often an arrangement can be made by one or both Departmental representatives to overcome this problem. THEREFORE, SEE YOUR REPRESENTATIVE BEFORE DECIDING UPON YOUR FINAL SUBJECT COMBINATIONS.

STUDENT ACADEMIC PROGRESS
All students are reminded of the need to maintain satisfactory progress and, in particular, attention is drawn to the Regulations Governing Unsatisfactory Progress. The following should be borne in mind:

1. The Faculty Board requires that students shall pass at least one subject in their first year of full-time attendance or in their first two years of part-time attendance.
2. The Faculty Board has determined that at least four subjects be passed at the end of the first two years of full-time attendance or four years of part-time attendance.
3. The Faculty Board has determined that a student who fails a subject twice shall not be permitted to include that subject in his future programme, and that a student who fails two subjects twice shall be excluded from further enrolment in the Faculty, in each case unless he shows cause to the satisfaction of the Faculty Board why he should be permitted to do so.
4. Notwithstanding paragraphs 1, 2 and 3, above, the Faculty Board may review the academic progress of a student in the later years of the course.

N.B. Where there is a change in attendance status, two part-time years will be taken as the equivalent of one full-time year for the purposes of this policy.

ADVISORY PREREQUISITES FOR ENTRY TO THE FACULTY
There are no prescribed prerequisites for entry to the Faculty of Science; students are advised of the following advisory prerequisites:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Advisory prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology I</td>
<td>Higher School Certificate Chemistry or 4-unit Science is appropriate and students are advised to include Chemistry I in their University programme.</td>
</tr>
<tr>
<td>Chemistry I</td>
<td>At least Mathematics (2-unit course), Physics (2-unit course) and Chemistry (3-unit course), with ranking in the top 50% in each case.</td>
</tr>
<tr>
<td>Geology I</td>
<td>2-units of Science (preferably Chemistry) and at least 2-units of Mathematics.</td>
</tr>
<tr>
<td>Mathematics I</td>
<td>Mathematics (2-unit course). Nevertheless, students who have less than 3-units of preparation will usually find themselves seriously disadvantaged.</td>
</tr>
<tr>
<td>Physics I A</td>
<td>2-unit, 3-unit or 4-unit Mathematics, with preference for the 3-unit or 4-unit subject. Students attempting HSC Mathematics at the 2-unit level are advised that they should achieve a level of performance placing them in the top 30% of the 2-unit Mathematics candidature, and</td>
</tr>
<tr>
<td>Physics I B</td>
<td>2-unit Physics or 4-unit Science (including the Physics 'make-up' electives) with a level of performance placing them in the top 50% of the candidature for these subjects.</td>
</tr>
</tbody>
</table>

PREREQUISITES FOR DIPLOMA IN EDUCATION UNITS
Students who intend to proceed to a Diploma in Education should familiarise themselves with the prerequisites for units offered in the Course.

These prerequisites are stated in terms of subjects of the University of Newcastle. Applicants whose courses of study have included subjects which are deemed for this purpose to provide an equivalent foundation may be admitted to the Diploma course as special cases.

In the Diploma course the Problems in Teaching, and Learning units are grouped as follows:

Primary
English
History
Social Science
(geography, Commerce, Social Science)
Mathematics
Science
Languages (French, German)
Prerequisites
For secondary method a Part III subject in the main teaching area and a Part II subject in another teaching area.
For primary method a Part II subject in one secondary teaching area, and a Part I subject in another secondary teaching area.

N.B. Except in Education, a Part II subject assumes as a prerequisite a pass in a Part I subject in the same discipline.
A Part III subject assumes a pass in a Part II subject in the same discipline.

FACULTY POLICY IN REGARD TO STANDING FOR DIPLOMA COURSES COMPLETED AT A CAE
Where an applicant has been awarded a Diploma by a recognised College of Advanced Education, the Faculty Board may be willing to approve some standing in the degree programme. For an approved C.A.E. course which has involved study over at least three full-time years in a relevant field, the requirements for admission to the ordinary degree of Bachelor of Science may be satisfied by the completion of two major sequences in Science, i.e. two Part I subjects, two Part II subjects and two Part III subjects, with the two sequences being drawn, in most cases, from two different disciplines.

UNDERGRADUATE COURSES
REGULATIONS RELATING TO THE ORDINARY DEGREE OF BACHELOR OF SCIENCE

1. These Regulations prescribe the requirements for the ordinary degree of Bachelor of Science of the University of Newcastle and are made in accordance with the powers vested in the Council under By-law 5.2.1.

2. Definitions
In these Regulations, unless the context or subject matter otherwise indicates or requires:
"course" means the total requirements prescribed from time to time to qualify a candidate for the degree.
"Dean" means the Dean of the Faculty.
"the degree" means the degree of Bachelor of Science.
"Department" means the Department offering a particular subject and includes any other body so doing.
"Faculty" means the Faculty of Science.
"Faculty Board" means the Faculty Board of the Faculty.
"subject" means any part of the course for which a result may be recorded.

3. Enrolment
(1) A candidate's enrolment in any year must be approved by the Dean or the nominee of the Dean.
(2) A candidate may not enrol in any year in any combination of subjects which is incompatible with the requirements of the timetable for that year.
(3) Except with the permission of the Dean given only if the Dean is satisfied that the academic merit of the candidate so warrants:
   (a) a candidate shall not enrol in more than four subjects in any one academic year;
   (b) a candidate enrolling in four subjects in any one academic year shall not enrol in a Part III subject nor more than two Part II subjects in that year;
   (c) a candidate enrolling in three subjects in any one academic year shall not enrol in more than one Part III subject in that year.

4. Qualification for Admission to the Degree
To qualify for admission to the degree a candidate shall pass nine subjects presented in accordance with the provisions of Regulations 9 and 10 of these Regulations.

5. Subject
(1) To complete a subject a candidate shall attend such lectures, tutorials, seminars, laboratory classes and field work and submit such written or other work as the Department shall require.
(2) To pass a subject a candidate shall complete it and pass such examinations as the Faculty Board shall require.

6. Standing
(1) The Faculty Board may grant standing in specified and unspecified subjects to a candidate, on such conditions as it may determine, in recognition of work completed in this university or another institution.
(2) A candidate may not be granted standing in more than four subjects which have already counted towards a degree to which the candidate has been admitted or is eligible for admission.

7. Prerequisites and Corequisites
Except with the permission of the Faculty Board granted after considering any recommendation made by the Head of the Department, no candidate may enrol in a subject unless that candidate has passed any subjects prescribed as its prerequisites at any grade which may be specified and has already passed or concurrently enrolled in or is already enrolled in any subjects prescribed as its corequisites.

8. Withdrawal
(1) A candidate may withdraw from a subject or the course only by informing the Secretary to the University in writing and the withdrawal shall take effect from the date of receipt of such notification.
(2) A candidate who withdraws from a subject after the last Monday in second term shall be deemed to have failed in the subject save that, after consulting with the Head of Department, the Dean may grant permission for withdrawal without penalty.

9. Choice of Subjects
(1) The nine subjects presented for the degree shall include:
   (a) not fewer than six subjects selected from the Schedule of Subjects to these Regulations;
   (b) at least three of the following:
      Biology I, Chemistry I, Computer Science I, Geography I, Geology I, Mathematics I, Physics IA or Physics IB, and Psychology I;
   (c) at least one Part III subject selected from those offered by the Departments of Biological Sciences, Chemistry, Geography, Geology, Physics and Psychology.
(2) A candidate may select up to three subjects from subjects offered in the courses leading to other degrees of the University with the permission of the Dean, who shall determine the classification of each such subject as a Part I, Part II or Part III subject.
(3) The subjects presented for the degree shall not include:
   (a) more than one of Physics IA and Physics IB;
   (b) more than five subjects from any one Department;
   (c) Psychology IIC if either Psychology IIA or Psychology IIB is included;
   (d) Geology IIC if either Geology IIIA or Geology IIB is included;
   (e) Psychology IIC if either Psychology IIIA or Psychology IIB is included.

1 Subject offered in the Faculty of Mathematics.
A candidate may not present for the degree subjects which have previously been counted towards another degree or diploma obtained by the candidate, except to such extent as the Faculty Board may permit.

10. **Degree Pattern**

Irrespective of the order in which they are passed, the subjects presented for the degree shall conform with one of the following degree patterns:

<table>
<thead>
<tr>
<th>Part I subjects</th>
<th>Part II subjects</th>
<th>Part III subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) 4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>(b) 4</td>
<td>2</td>
<td>3</td>
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<td>(c) 5</td>
<td>2</td>
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<tr>
<td>(d) in exceptional circumstances, with the permission of the Dean</td>
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</tbody>
</table>

11. **Results**

The result obtained by a successful candidate in a subject shall be: Terminating Pass, Pass, Credit, Distinction or High Distinction.

12. **Time Requirements**

Except with the special permission of the Faculty Board, a candidate shall complete the requirements for the ordinary degree within nine calendar years of the commencement of the degree course. A candidate who has been granted standing in recognition of work completed elsewhere shall be deemed to have commenced the degree course from a date to be determined by the Dean.

13. **Relaxing Provision**

In order to provide for exceptional circumstances arising in particular case the Senate on the recommendation of the Faculty Board may relax any provision of these Regulations.

### COMBINED DEGREE COURSES

14. **General**

A candidate may complete the requirements for the degree in conjunction with another Bachelor's degree by completing a combined course approved by the Faculty Board and also the Faculty Board of the Faculty offering that other Bachelor's degree.

15. **Admission to a combined degree course:**

(a) shall be subject to the approval of the Deans of the two Faculties;

(b) shall, except in exceptional circumstances, be at the end of the candidate's first year of enrolment for the ordinary degree; and

(c) shall be restricted to candidates with an average of at least credit level.

16. The work undertaken by a candidate in a combined degree course shall be no less in quantity and quality than if the two courses were taken separately and shall be certified by the Deans of the two Faculties.

17. To qualify for admission to the two degrees a candidate shall satisfy the requirements for both degrees except as provided in Regulations 18, 19 and 20 of these Regulations.

18. **Science/Arts**

To qualify for admission to the ordinary degrees of Bachelor of Science and Bachelor of Arts, a candidate shall complete all the requirements for the degree of Bachelor of Science and all the requirements for the degree of Bachelor of Arts other than those prescribed in Regulations 3(3) and 10, and shall pass fourteen subjects chosen from the Schedule of Subjects approved for the two degrees, provided that:

(a) at least six subjects, including at least one Part III subject, shall be chosen from Group I of the Schedule of Subjects approved for the degree of Bachelor of Arts;

(b) at least six subjects, including at least one Part III subject and one Part II subject in a different department, shall be chosen from the Schedule of Subjects approved for the degree of Bachelor of Science, the Part III subject selected to be from a department other than that offering the Part III subject mentioned in (a); and

(c) the maximum total number of Arts Part I subjects and Science Part I subjects shall not exceed six.

19. **Science/Mathematics**

(1) A candidate shall qualify for admission to the ordinary degrees of Bachelor of Science and Bachelor of Mathematics by passing fourteen subjects, as follows:

(a) five subjects, being Mathematics I, Mathematics II A, Mathematics II C, Mathematics III A and another Part III subject chosen from the Schedule of Subjects approved for the degree of Bachelor of Mathematics; and

(b) six subjects chosen from the other subjects listed in the Schedule of Subjects approved for the degree of Bachelor of Science; and

(c) three subjects chosen, with the approval of the Deans of the Faculties of Mathematics and Science, from the subjects approved for any of the degree courses offered by the University.

(2) The following restrictions shall apply to a candidate's choice of subjects, namely:

(a) the number of Part I subjects shall not exceed six;

(b) the minimum number of Part III subjects shall be three;

(c) a candidate counting Psychology II C shall not be entitled to count either Psychology III A or Psychology III B;

(d) a candidate counting Psychology III C shall not be entitled to count either Psychology III A or Psychology III B;

(e) a candidate counting Economics III C shall not be entitled to count either Economics III A or Economics III B;

(f) a candidate counting Geology III C shall not be entitled to count either Geology III A or Geology III B.

20. **Science/Engineering**

A candidate shall qualify for admission to the ordinary degree of Bachelor of Science and the degree of Bachelor of Engineering in any specialisation by completing a combined course approved by the Faculty Boards of Science and Engineering.

### SCHEDULE OF SUBJECTS

<table>
<thead>
<tr>
<th>Subject</th>
<th>Remarks, Prerequisites, Corequisites, Preparatory Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PART I</strong></td>
<td></td>
</tr>
<tr>
<td>Biology I</td>
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<tr>
<td>Chemistry I</td>
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<tr>
<td>Computer Science I</td>
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<td>Geography I</td>
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<td>Geology I</td>
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<td>Mathematics I</td>
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<tr>
<td>Physics I A</td>
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<tr>
<td>Physics I B</td>
<td></td>
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<tr>
<td>Psychology I</td>
<td></td>
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</tbody>
</table>

Only one of these two subjects may be taken.
## REGULATIONS RELATING TO THE DEGREE OF BACHELOR OF SCIENCE (PSYCHOLOGY)

1. These Regulations prescribe the requirements for the degree of Bachelor of Science (Psychology) of the University of Newcastle and are made in accordance with the powers vested in the Council under By-law 5.2.1.

### Definitions

2. In these Regulations, unless the context or subject matter otherwise indicates or requires:

- "course" means the total requirements prescribed from time to time to qualify a candidate for the degree.
- "Dean" means the Dean of the Faculty.
- "the degree" means the degree of Bachelor of Science (Psychology).
- "Department" means the Department offering a particular subject and includes any other body so doing.
- "Faculty" means the Faculty of Science.
- "Faculty Board" means the Faculty Board of the Faculty.
- "subject" means any part of the course for which a result may be recorded.

### Grading of Degrees

3. (1) The degree may be conferred either as an ordinary degree or as an honours degree.

   (2) There shall be three classes of honours: Class I, Class II and Class III.

   Class II shall have two divisions, namely Division I and Division II.

### Withdrawal

4. (1) A candidate may withdraw from a subject or the course only by informing the Secretary to the University in writing and the withdrawal shall take effect from the date of receipt of such notification.

   (2) A candidate who withdraws from a subject after the last Monday in second term shall be deemed to have failed in the subject save that, after consulting with the Head of Department, the Dean may grant permission for withdrawal without penalty.
Prerequisites and Corequisites
5. Except with the permission of the Faculty Board granted after considering any recommendation made by the Head of the Department, no candidate may enrol in a subject unless he has passed any subjects prescribed as its prerequisites at any grade which may be specified and has already passed or concurrently enrols in or is already enrolled in any subjects prescribed as its corequisites.

Subject
6. (1) To complete a subject a candidate shall attend such lectures, tutorials, seminars, laboratory classes and field work and submit such written or other work as the Department shall require.
(2) To pass a subject a candidate shall complete it and pass such examinations as the Faculty Board shall require.

Enrolment
7. (1) A candidate's enrolment in any year must be approved by the Dean or his nominee.
(2) A candidate may not enrol in any year in any combination of subjects which is incompatible with the requirements of the timetable for that year.
(3) Except with the permission of the Dean given only if he is satisfied that the academic merit of the candidate so warrants:
   (a) a candidate shall not enrol in more than four subjects in any one academic year;
   (b) a candidate enrolling in four subjects in any one academic year shall not enrol in a Part III subject nor more than two Part II subjects in that year;
   (c) a candidate enrolling in three subjects in any one academic year shall not enrol in more than one Part III subject in that year; and
   (d) a candidate enrolling in a Part IV subject shall not enrol in any other subject.

Qualification for Admission to the Degree
8. To qualify for admission to the degree a candidate shall pass ten subjects presented in accordance with the provisions of Regulations 10 and 11 of these Regulations.

Standing
9. (1) The Faculty Board may grant standing in specified and unspecified subjects to a candidate, on such conditions as it may determine, in recognition of work completed in this university or another institution.
(2) A candidate may not be granted standing in more than four subjects which have already counted towards a degree to which he has been admitted or is eligible for admission.

Choice of Subjects
10. The ten subjects presented for the degree shall be chosen in accordance with the following provisions, namely:
   (a) A candidate shall include—
      (i) six subjects being Psychology I, Psychology II, Psychology III, Psychology IV or Psychology IVP or Psychology IV;
      (ii) unless the Dean, after consultation with the Head of the Department of Psychology, otherwise permits in a particular case, at least two other Part I subjects, selected from the following—
         Biology I, Chemistry I, Computer Science I, Geography I, Geology I, Mathematics I, and Physics I A or IB.
   (b) A candidate may select up to two subjects from those offered in courses leading to other degrees of the University with the permission of the Dean, who shall determine the classification of each subject as a Part I or Part II subject.

Degree Patterns
11. Irrespective of the order in which they are passed, the subjects presented for the degree shall conform with one of the following degree patterns:

<table>
<thead>
<tr>
<th>Part I</th>
<th>Part II</th>
<th>Part III</th>
<th>Part IV</th>
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<tbody>
<tr>
<td>subjects</td>
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<tr>
<td>(b) 3</td>
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<tr>
<td>(c) 3</td>
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<td>3</td>
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</tbody>
</table>

Results
12. The results obtained by a successful candidate in a Part I, Part II or Part III subject shall be: Terminating Pass, Pass, Credit, Distinction or High Distinction; in Psychology IVP Pass, Credit, Distinction or High Distinction; in Psychology IV Honours Class III, II(2), II(1) or I.

Relaxing Provision
13. In order to provide for exceptional circumstances arising in a particular case the Senate on the recommendation of the Faculty Board may relax any provision of these Regulations.

SCHEDULE OF SUBJECTS

PART I
Prerequisite Corequisite
Psychology I

PART II
Psychology II
Psychology I
Psychology IIA

PART III
Psychology IIIA
Psychology II A
Psychology IIIA
Psychology IIIB
Psychology II B
Psychology IIIA

PART IV
Psychology IVP
Psychology IVA
Psychology IV
Psychology IVB

Notes for students interested in the BSc(Psychology) degree
1. The Bachelor of Science degree with Honours in Psychology remains the preferred path for those who wish to complete a four-year Psychology course.
2. Students will not be permitted to transfer from Psychology IVP to Psychology IV, although the reverse may be permissible.
POSTGRADUATE COURSES
Studies may be undertaken for the following postgraduate qualifications:
Bachelor of Science (Honours)
Diploma in Coal Geology
Diploma in Psychology
Diploma in Science
Master of Psychology (Clinical)
Master of Psychology (Educational)
Master of Science
Master of Scientific Studies
Doctor of Philosophy

REGULATIONS RELATING TO THE HONOURS DEGREE OF BACHELOR OF SCIENCE
1. These Regulations prescribe the requirements for the honours degree of Bachelor of Science of the University of Newcastle and are made in accordance with the powers vested in the Council under By-Law 5.2.1.

2. Definitions
In these Regulations, unless the context or subject matter otherwise indicates or requires:
"course" means the total requirements prescribed from time to time to qualify a candidate for the degree.
"Dean" means the Dean of the Faculty.
"degree" means the degree of Bachelor of Science (Honours).
"Department" means the Department or Departments offering a particular subject and includes any other body so doing.
"Faculty" means the Faculty of Science.
"Faculty Board" means the Faculty Board of the Faculty.

3. Admission to Candidature
In order to be admitted to candidacy for the degree an applicant shall:
(a) have completed the requirements for admission to a degree of the University of Newcastle or a degree, approved for this purpose by the Faculty Board, of any other tertiary institution, provided that the course completed for that degree by the applicant included a major sequence in Geology; or
(b) have completed any additional work prescribed by the Head of the Department offering the honours subject; and
(c) have obtained approval to enrol given by the Dean on the recommendation of the Head of the Department offering the honours subject.

4. Qualification for Admission to the Degree
To qualify for admission to the degree a candidate shall, in one year of full-time study or two years of part-time study, pass one of the following honours subjects:
Biology IV
Chemistry IV
Geography IV
Geology/Mathematics IV
Physics/Mathematics IV, or
Psychology/Mathematics IV.

5. Subject
(1) To complete the honours subject a candidate shall attend such lectures, tutorials, seminars, laboratory classes and field work and submit such written or other work as the Department shall require.
(2) To pass the honours subject a candidate shall complete it and pass such examinations as the Faculty Board shall require.

6. Withdrawal
(1) A candidate may withdraw from the honours subject only by informing the Secretary to the University in writing and the withdrawal shall take effect from the date of receipt of such notification.
(2) A candidate who withdraws from the honours subject after the last Monday in second term shall be deemed to have failed in the subject save that, after consulting with the Head of Department, the Dean may grant permission for withdrawal without penalty.

7. Classes of Honours
There shall be three classes of honours: Class I, Class II and Class III. Class II shall have two divisions, namely Division I and Division II.

8. Relaxing Provision
In order to provide for exceptional circumstances arising in a particular case, the Senate, on the recommendation of the Faculty Board, may relax any provision of these Regulations.

REGULATIONS RELATING TO THE DIPLOMA IN COAL GEOLOGY
1. These Regulations prescribe the requirements for the Diploma in Coal Geology of the University of Newcastle and are made in accordance with the powers vested in the Council under By-Law 5.2.1.

2. In these Regulations, unless the context or subject matter otherwise indicates or requires:
"Department" for candidates for the Diploma means the Department of Geology;
"Diploma" means the Diploma in Coal Geology;
"Faculty Board" means the Faculty Board of the Faculty of Science.

3. An applicant for admission shall:
(a) have satisfied the requirements for admission to a degree of the University of Newcastle or a degree, approved for this purpose by the Faculty Board, of any other tertiary institution, provided that the course completed for that degree by the applicant included a major sequence in Geology; or
(b) have other qualifications and professional experience deemed appropriate by the Faculty Board on the recommendation of the Head of the Department.

4. Admission to candidature shall require the approval of the Faculty Board on the recommendation of the Head of the Department.

5. A candidate who withdraws from the honours subject after the last Monday in second term shall be deemed to have failed in the subject save that, after consulting with the Head of Department, the Dean may grant permission for withdrawal without penalty.

6. The Diploma may be awarded with merit.

7. In order to provide for exceptional circumstances arising in a particular case, the Senate, on the recommendation of the Faculty Board, may relax any provision of these Requirements.
REQUIREMENTS FOR THE DIPLOMA IN PSYCHOLOGY

GENERAL

1. There shall be a Diploma in Psychology.

2. In these Requirements, unless the context or subject-matter otherwise indicates or requires, "the Faculty Board" means the Faculty Board of the Faculty of Science, "the Board of Studies" means the Board of Studies in Psychology, and "the Dean" means the Dean of the Faculty of Science.

3. A candidate for the Diploma shall register in one of the following specialisations:
   (a) Clinical Psychology;
   (b) Educational Psychology.

4. The Diploma shall be awarded in one grade only.

5. A candidate may withdraw from the course only by informing the Secretary to the University in writing and the withdrawal shall take effect from the date of receipt of such notification.

6. In exceptional circumstances, the Senate may, on the recommendation of the Faculty Board, relax any provision of these Requirements.

Clinical Specialisation

7. An applicant for registration as a candidate for the Diploma in the Clinical Specialisation shall:
   (a) have satisfied all of the requirements for admission to a Bachelor's degree with honours in Psychology in the University of Newcastle or to such a degree in another university approved for this purpose by the Faculty Board; and
   (b) be selected for admission to the course by the Board of Studies which shall, in making this determination, take account of the applicant's academic qualifications, experience, and the report of an interview which shall be conducted by a selection committee which the Board shall appoint.

8. (a) Notwithstanding the provision of subsection (a) of Section 7, the Faculty Board, on the recommendation of the Board of Studies, may permit to register as a provisional candidate a person who has satisfied all of the requirements for admission for a Part IV subject as a provisional candidate a person who has satisfied all of the requirements for admission to a degree of the University of Newcastle or another university approved for this purpose by the Faculty, provided that the course completed for that degree by the applicant included a major study in Psychology.

   (b) A candidate permitted to register provisionally under the provisions of subsection (a) of this Section shall complete such work and pass such examinations at Bachelor's degree honours level as may be prescribed by the Faculty Board before his registration may be confirmed by the Faculty Board.

9. A candidate for the Diploma in the Clinical Specialisation shall, in not less than two years of part-time enrolment, attend such lectures, seminars and tutorials; complete such written and practical work; and pass such examinations as may be prescribed by the Board of Studies.

Educational Specialisation

10. An applicant for registration as a candidate for the Diploma in the Educational Specialisation shall:
    (i) have satisfied all of the requirements for admission to a Bachelor's degree in the University of Newcastle and have included in the qualifying course for that degree at least one Part II Psychology subject; or
    (ii) have satisfied all of the requirements for admission to an equivalent qualification in another university recognised for this purpose by the Faculty Board;

    (b) have satisfied all of the requirements for the award of the Diploma in Education in the University of Newcastle or another teaching qualification approved for this purpose by the Faculty Board;

    (c) have at least two years teaching or other relevant practical experience approved by the Board of Studies; and

    (d) be selected for admission to the course by the Board of Studies which shall, in making this determination, take account of the applicant's academic qualifications; experience; and the report of an interview which shall be conducted by a selection committee which the Board shall appoint.

11. A candidate for the Diploma in the Educational Specialisation shall, in not less than two years of full-time enrolment or an equivalent period of part-time enrolment, attend lectures, seminars and tutorials; complete such written and practical work; and pass such examinations as may be prescribed by the Board of Studies.

REGULATIONS RELATING TO THE DIPLOMA IN SCIENCE

1. These Regulations prescribe the requirements for the Diploma in Science of the University of Newcastle and are made in accordance with the powers vested in the Council under By-law 5.2.1.

2. In these Regulations, unless the context or subject matter otherwise indicates or requires:
    "Department" means the Department offering the subject in which a person is enrolled or is proposing to enrol;
    "Diploma" means the Diploma in Science;
    "Faculty Board" means the Faculty Board of the Faculty of Science;
    "a Part IV subject" means a Part IV subject offered in the course leading to the degree of Bachelor of Science.

3. (1) An applicant for admission to candidature for the diploma shall have satisfied all the requirements for admission to a degree of the University of Newcastle, or to a degree, approved for this purpose by the Faculty Board, of any other tertiary institution.

   (2) A candidate shall have met such requirements for entry to a Part IV subject as may be prescribed from time to time by the Head of the Department and approved by the Faculty Board or have achieved at another tertiary institution a standard of performance deemed by the Head of the Department to be equivalent.

4. (1) To qualify for the Diploma, a candidate shall enrol and shall complete the Part IV subject to the satisfaction of the Faculty Board.

   (2) Except with the permission of the Faculty Board, the Part IV subject shall be satisfactorily completed in not less than one year of full-time study or not less than two years of part-time study.

5. To complete the Part IV subject a candidate shall attend such lectures, tutorials, seminars and laboratory classes, and submit such written and other work as the Faculty Board may require and pass such examinations as the Faculty Board may prescribe.

6. (1) A candidate may withdraw from the subject only by notifying the Secretary to the University in writing and the withdrawal shall take effect from the date of receipt of such notification.

   (2) A candidate who withdraws from the subject after the last Monday in second term shall be deemed to have failed in that subject unless granted permission by the Dean to withdraw without penalty.
7. The Diploma shall be awarded in one of three classes, namely Class I, Class II and Class III. Class II shall have two divisions. The Classes shall indicate a level of achievement comparable with that of a candidate for the degree of Bachelor of Science (Honours).

8. The Diploma shall specify the Part IV subject completed.

9. In order to provide for exceptional circumstances arising in particular cases, the Senate, on the recommendation of the Faculty Board, may relax any provision of these Regulations.

REGULATIONS GOVERNING MASTERS DEGREES

PART I — GENERAL

1. (1) These Regulations prescribe the conditions and requirements relating to the degrees of Master of Architecture, Master of Arts, Master of Commerce, Master of Education, Master of Educational Studies, Master of Engineering, Master of Engineering Science, Master of Mathematics, Master of Psychology (Clinical), Master of Psychology (Educational), Master of Science, Master of Medical Science, Master of Scientific Studies, Master of Special Education, Master of Surveying and Master of Letters.

(2) In these Regulations and the Schedules thereto, unless the context or subject matter otherwise indicates or requires:

"Faculty Board" means the Faculty Board of the Faculty responsible for the course in which a person is enrolled or is proposing to enrol;

"programme" means the programme of research and study prescribed in the Schedule;

"Schedule" means the Schedule of these Regulations pertaining to the course in which a person is enrolled or is proposing to enrol; and

"thesis" means any thesis or dissertation submitted by a candidate.

(3) These Regulations shall not apply to degrees conferred honoris causa.

(4) A degree of Master shall be conferred in one grade only.

2. An application for admission to candidature for a degree of Master shall be made on the prescribed form and lodged with the Secretary to the University by the prescribed date.

3. (1) To be eligible for admission to candidature an applicant shall:

(a) (i) have satisfied the requirements for admission to a degree of Bachelor in the University of Newcastle as specified in the Schedule; or

(ii) have satisfied the requirements for admission to a degree or equivalent qualification, approved for the purpose by the Faculty Board, in another tertiary institution; or

(iii) have such other qualifications and experience as may be approved by the Senate on the recommendation of the Faculty Board or otherwise as may be specified in the Schedule; and

(b) have satisfied such other requirements as may be specified in the Schedule.

(2) Unless otherwise specified in the Schedule, applications for admission to candidature shall be considered by the Faculty Board which may approve or reject any application.

(3) An applicant shall not be admitted to candidature unless adequate supervision and facilities are available. Whether these are available shall be determined by the Faculty Board unless the Schedule otherwise provides.

4. To qualify for admission to a degree of Master a candidate shall enrol and satisfy the requirements of these Regulations including the Schedule.

5. The programme shall be carried out:

(a) under the guidance of a supervisor or supervisors either appointed by the Faculty Board or as otherwise prescribed in the Schedule; or

(b) as the Faculty Board may otherwise determine.

6. Upon request by a candidate the Faculty Board may grant leave of absence from the course. Such leave shall not be taken into account in calculating the period for the programme prescribed in the Schedule.

7. (1) A candidate may withdraw from a subject or course only by informing the Secretary to the University in writing and such withdrawal shall take effect from the date of receipt of such notification.

(2) A candidate who withdraws from any subject after the relevant date shall be deemed to have failed in that subject unless granted permission by the Dean to withdraw without penalty.

The relevant date shall be:

(a) in the case of a subject offered in the first half of the academic year — the eighth Monday in first term;

(b) in the case of a subject offered in the second half of the academic year — the second Monday in third term;

(c) in the case of any other subject — the sixth Monday in second term.

8. (1) If the Faculty Board is of the opinion that the candidate is not making satisfactory progress towards the degree then it may terminate the candidature or place such conditions on its continuation as it deems fit.

(2) For the purpose of assessing a candidate's progress, the Faculty Board may require any candidate to submit a report or reports on his progress.

(3) A candidate against whom a decision of the Faculty Board has been made under Regulation 8(1) of these Regulations may request that the Faculty Board cause his case to be reviewed. Such request shall be made to the Dean of the Faculty within seven days from the date of posting to the candidate the advice of the Faculty Board's decision or such further period as the Dean may accept.

(4) A candidate may appeal to the Vice-Chancellor against any decision made following the review under Regulation 8(3) of these Regulations.

9. In exceptional circumstances arising in a particular case, the Senate, on the recommendation of the Faculty Board, may relax any provision of these Regulations.

PART II — EXAMINATION AND RESULTS

10. The Examination Regulations approved from time to time by the Council shall apply to all examinations with respect to a degree of Master with the exception of the examination of a thesis which shall be conducted in accordance with the provisions of Regulations 12 to 16 inclusive of these Regulations.

11. The Faculty Board shall consider the results in subjects, the reports of examiners and any other recommendations prescribed in the Schedule and shall decide:

(a) to recommend to the Council that the candidate be admitted to the degree; or

(b) in a case where a thesis has been submitted, to permit the candidate to resubmit an amended thesis within twelve months of the date on which the candidate is advised of the result of the first examination or within such longer period of time as the Faculty Board may prescribe; or

(c) to require the candidate to undertake such further oral, written or practical examination as the Faculty Board may prescribe; or

(d) not to recommend that the candidate be admitted to the degree, in which case the candidature shall be terminated.
PART III — PROVISIONS RELATING TO THESES

12. (1) The subject of a thesis shall be approved by the Faculty Board on the recommendation of the Head of the Department in which the candidate is carrying out his research.

13. The candidate shall give to the Secretary to the University three months' written notice of the date he expects to submit a thesis and such notice shall be accompanied by any prescribed fee.¹

14. (1) The candidate shall comply with the following provisions concerning the presentation of a thesis:

(a) the thesis shall contain an abstract of approximately 200 words describing its content;

(b) the thesis shall be typed and bound in a manner prescribed by the University;

(c) three copies of the thesis shall be submitted together with:

(i) a certificate signed by the candidate that the main content of the thesis has not been submitted by the candidate for a degree of any other tertiary institution; and

(ii) a certificate signed by the supervisor indicating whether the candidate has completed the programme and whether the thesis is of sufficient academic merit to warrant examination; and

(iii) if the candidate so desires, any documents or published work of the candidate whether bearing on the subject of the thesis or not.

(2) The Faculty Board shall determine the course of action to be taken should the certificate of the supervisor indicate that in the opinion of the supervisor the thesis is not of sufficient academic merit to warrant examination.

15. The University shall be entitled to retain the submitted copies of the thesis, accompanying documents and published work. The University shall be free to allow the thesis to be consulted or borrowed and, subject to the provisions of the Copyright Act, 1968 (Con), may issue it in whole or any part in photocopy or microfilm or other copying medium.

16. (1) For each candidate two examiners, at least one of whom shall be an external examiner (being a person who is not a member of the staff of the University) shall be appointed either by the Faculty Board or otherwise as prescribed in the Schedule.

(2) If the examiners' reports are such that the Faculty Board is unable to make any decision pursuant to Regulation 11 of these Regulations, a third examiner shall be appointed either by the Faculty Board or otherwise as prescribed in the Schedule.

¹ At present there is no fee payable.

SCHEDULE 9 — MASTER OF PSYCHOLOGY (CLINICAL)

1. (1) The Faculty of Science shall be responsible for the course leading to the degree of Master of Psychology (Clinical).

(2) Unless the context or subject matter otherwise indicates or requires, "the Board" means the Board of Studies in Psychology.

2. On the recommendation of the Head of the Department of Psychology, the Board shall appoint a course controller who shall recommend to the Board the nature and extent of the programmes to be prescribed and shall be responsible for the collation of all written work submitted by candidates in pursuing those programmes.

3. To be eligible for admission to candidature an applicant shall:

(a) have satisfied all the requirements for admission to a degree of bachelor with honours in Psychology of the University of Newcastle or to an honours degree, approved for this purpose by the Faculty Board, of another university; OR

(b) on the recommendation of the Board, have satisfied all the requirements for admission to a degree of the University of Newcastle or to a degree, approved for this purpose by the Faculty Board, of another university, provided that the course completed for that degree by the applicant included a major sequence in Psychology.

4. (1) The Board shall consider each application for admission to candidature and shall make a decision thereon.

(2) Before approving an application to candidature under Section 3(b) of this schedule the Board may require an applicant to complete such work and pass such examinations at honours level as may be prescribed by the Board.

5. (1) To qualify for admission to the degree the candidate shall:

(a) attend such lectures, seminars and tutorials and complete to the satisfaction of the Board the work prescribed under section 5(a) of this Schedule;

(b) submit a thesis embodying the results of an empirical investigation.

(2) The programme shall be completed in not less than two years and, except with the permission of the Faculty Board given on the recommendation of the Board, not more than six years.

6. (1) Examiners shall be appointed by the Faculty Board on the recommendation of the Board.

(2) One examiner appointed pursuant to Regulation 16(1) of these Regulations shall be an internal examiner being a member of the staff of the University.

7. Before a decision is made under Regulation 11 of these Regulations the Board shall consider:

(a) the examiners' reports on the thesis; and

(b) a report of the internal examiner made in consultation with the course controller on the candidate's performance in the work prescribed under section 5(a) of this Schedule;

and shall submit these to the Faculty Board together with its recommendation. The Faculty Board shall make its decision in the light of these reports and on the recommendation of the Board.
SCHEDULE 10 — MASTER OF PSYCHOLOGY
(EDUCATIONAL)

1. (1) The Faculty of Science shall be responsible for the course leading to the degree
Master of Psychology (Educational).
   (2) Unless the context or subject matter otherwise indicates or requires, "the Board"
means the Board of Studies in Psychology.

2. On the recommendation of the Head of the Department of Psychology, the Board
shall appoint a course controller who shall recommend to the Board the nature and
extent of the programmes to be prescribed and shall be responsible for the collation
of all written work submitted by candidates in pursuing those programmes.

3. To be eligible for admission to candidature an applicant shall:
   (a) have satisfied all the requirements for admission to a degree of bachelor of
the University of Newcastle or to a degree, approved for this purpose by the
Faculty Board, of another university and have satisfactorily completed a Part
III Psychology subject or reached a standard in Psychology deemed by the
Board to be equivalent; and
   (b) have satisfied all the requirements for the award of the Diploma in Education
of the University of Newcastle or another teaching qualification approved for
this purpose by the Faculty Board; and
   (c) have at least two years teaching or other relevant practical experience
approved by the Board.

4. (1) The Board shall consider each application for admission to candidature
and shall make a decision thereon.
   (2) Before an application for admission to candidature is approved, the Board
shall be satisfied that adequate supervision and facilities are available.

5. (1) To qualify for admission to the degree the candidate shall:
   (a) attend such lectures, seminars and tutorials, and complete to the
satisfaction of the Board such written and practical work and
examinations as may be prescribed by the Board; and
   (b) submit a thesis embodying the results of an empirical investigation.
   (2) The programme shall be completed in not less than two years and, except with
the permission of the Faculty Board given on the recommendation of
the Board, not more than six years.

6. (1) Examiners shall be appointed by the Faculty Board on the recommendation
of the Board.
   (2) One examiner appointed pursuant to Regulation 16(1) of these Regulations
shall be an internal examiner being a member of the staff of the University.

7. Before a decision is made under Regulation 11 of these Regulations the Board
shall consider:
   (a) the examiners' reports on the thesis; and
   (b) a report of the internal examiner made in consultation with the course
controller on the candidate's performance in the work prescribed under section
5(a) of this Schedule;
and shall submit these to the Faculty Board together with its recommendation.
The Faculty Board shall make its decision in the light of these reports and on the
recommendation of the Board.

SCHEDULE II — MASTER OF SCIENCE

1. A candidate for the degree of Master of Science may be enrolled in either the
Faculty of Engineering or the Faculty of Science. The Faculty in which the
candidate is enrolled shall be responsible for the programme.

2. (1) To be eligible for admission to candidature in the Faculty of Science an
applicant shall:
   (a) have satisfied all the requirements for admission to the degree of Bachelor of
Science with honours Class I or Class II of the University of Newcastle
or to a degree, approved for this purpose by the Faculty
Board, of this or any other university; OR
   (b) have satisfied all the requirements for admission to the degree of
Bachelor of Science of the University of Newcastle or other approved
university and have completed such work and passed such examinations
as the Faculty Board may have determined and have achieved a standard
at least equivalent to that required for admission to a degree of bachelor
with second class honours in an appropriate subject; OR
   (c) in exceptional cases produce evidence of possessing such other
qualifications as may be approved by the Faculty Board on the
recommendation of the Head of the Department in which the applicant
proposes to carry out the programme.

   (2) To be eligible for admission to candidature in the Faculty of Engineering
an applicant shall:
   (a) have satisfied the requirements for admission to a degree with honours
in the University of Newcastle or other university approved for this
purpose by the Faculty Board in the area in which he proposes to carry
out his research; OR
   (b) have satisfied the requirements for admission to a degree in the
University of Newcastle or other university approved for this purpose
by the Faculty Board and have completed to the satisfaction of the Faculty
Board such work and examinations as determined by the Faculty Board;
OR
   (c) in exceptional cases produce evidence of possessing such other
qualifications as may be approved by the Faculty Board on the
recommendation of the Head of the Department in which the applicant
proposes to carry out his programme.

3. To qualify for admission to the degree a candidate shall complete to the
satisfaction of the Faculty Board a programme consisting of:
   (a) such work and examinations as may be prescribed by the Faculty Board; and
   (b) a thesis embodying the results of an original investigation or design.
4. The programme shall be completed:
   (a) in not less than two academic years except that, in the case of a candidate who
has completed the requirements for a degree of Bachelor with honours or a
qualification deemed by the Faculty Board to be equivalent or who has had
previous research experience, the Faculty Board may reduce this period to not
less than one academic year; and
   (b) except with the permission of the Faculty Board, in not more than 5 years.

5. (1) Except with the permission of the Faculty Board, which shall be given
only in special circumstances, a part-time candidate enrolled in the Faculty of
Science shall:
   (a) conduct the major proportion of the research or design work in
the University; and
   (b) take part in research seminars within the Department in which he is
carrying out his research.
(2) Except with the permission of the Faculty Board, a candidate enrolled in the Faculty of Engineering shall take part in the research seminars within the Department in which he is carrying out his research.

SCHEDULE 13 — MASTER OF SCIENTIFIC STUDIES

1. The Faculty of Science shall be responsible for the course leading to the degree of Master of Scientific Studies.

2. To be eligible for admission to candidature an applicant shall:

   (a) (i) have satisfied the requirements for admission to a degree with honours in the University of Newcastle or other tertiary institution approved for this purpose by the Faculty Board; or
   (ii) have satisfied the requirements for the Diploma in Science or Equivalent Honours in the University of Newcastle, or an equivalent qualification in another tertiary institution; or
   (iii) in exceptional cases produce evidence of possessing such other qualifications as may be approved by the Faculty Board; and
   (b) satisfy the Faculty Board that he is academically competent to undertake the proposed programme.

3. (1) To qualify for admission to the degree the candidate shall complete to the satisfaction of the Faculty Board a programme prescribed by the Dean on the recommendation of the Heads of the Departments offering the units comprising the programme.

   (2) The programme shall consist of 12 units of work of which not less than 2 nor more than 4 shall comprise the investigation of and report on a project specified by the Dean.

4. Units of work, other than those comprising the project, shall require attendance at lectures, seminars and tutorials and the completion to the satisfaction of the Faculty Board of such examinations as the Faculty Board may determine.

5. Except with the permission of the Faculty Board the programme shall be completed in not less than 3 terms and not more than 12 terms.

Important Regulations

Students should note that degree and diploma regulations and requirements are intended to supplement the general regulations.

Attention is particularly drawn to the following groups of regulations:

(a) Admission and Enrolment

The most important of these Regulations are listed below.

Undergraduate Admission

3. (1) In order to be considered for admission for any qualification other than a postgraduate qualification an applicant shall be required to:

   (a) either:
      (i) attain such aggregate of marks in approved subjects at the one New South Wales Higher School Certificate examination as may be prescribed by the Senate from time to time; or
      (ii) otherwise satisfy the Admissions Committee that he has reached a standard of education sufficient to enable him to pursue his approved course; and
   (b) satisfy any prerequisites prescribed for admission to the course leading to that qualification.

   (2) (a) The aggregate of marks prescribed by the Senate shall be determined by aggregating the marks gained in up to 10 units or, where more than 10 units are presented, the 10 units having the highest marks.

Record of Failure

4. An applicant who has a record of failure at another tertiary institution shall not be admitted unless he first satisfies —

   (a) the Faculty Board or the Doctoral Degree Committee for the Faculty as appropriate, in the case of a postgraduate qualification; or
   (b) the Admissions Committee, in the case of any other qualification; that there is a reasonable prospect that he will make satisfactory progress.

Enrolment

5. (1) In order to be admitted an applicant shall:

   (a) satisfy Regulation 3 of these Regulations;
   (b) receive approval to enrol;
   (c) complete the prescribed enrolment procedures; and
   (d) pay any fees and charges prescribed by the Council.

   (2) An applicant may be admitted under such conditions as the Admissions Committee may determine after considering any advice offered by the Dean of the Faculty.

6. (1) Except with the approval of the Faculty Board a candidate for a qualification shall not enrol in a subject which does not count towards that qualification.

   (2) A candidate for a qualification shall not enrol in a course or part of a course for another qualification unless he has first obtained the consent of the Dean of the Faculty and, if another Faculty is responsible for the course leading to that other qualification, the Dean of that Faculty; provided that a student may enrol in a combined course approved by the Senate leading to two qualifications.

   (3) A candidate for an any qualification other than a postgraduate qualification who is enrolled in three quarters or more of a normal full-time programme shall be deemed to be a full-time student whereas a candidate enrolled in either a part-time course or less than three-quarters of a full-time programme shall be deemed to be a part-time student.

Enrolment Status

10. (1) A candidate for a qualification shall enrol as either a full-time student or a part-time student.

Non-Degree Students

11. Notwithstanding anything to the contrary contained in these Regulations, the Admissions Committee may on the recommendation of the Head of a Department offering any part of a course permit a person, not being a candidate for a qualification of the University, to enrol in any year in that part of the course on payment of such fees and charges as may be prescribed by the Council. A person so enrolling shall be designated a "non-degree" student.

Re-enrolment

13. A candidate for a qualification shall be required to re-enrol annually during the period of this candidature. Upon receiving approval to re-enrol the candidate shall complete the prescribed procedures and pay the fees and charges determined by the Council not later than the date prescribed for payment.

Limit on Admission

14. Where the Council is of the opinion that a limit should be placed upon the number of persons who may in any year be admitted to a course or part of a course or to the University, it may impose such a limit and determine the manner of selection of those persons to be so admitted.
(b) Examination
A summary of the contents of these Regulations is included in the centre pages of this Handbook.

(c) Unsatisfactory Progress
These Regulations are reprinted in the centre pages of this Handbook.

COMBINED DEGREE COURSES
Any student contemplating enrolment in a combined degree course under BSc degree Regulations 14-20 is required to consult the Deans of both Faculties with a view to determining his individual programme.

Sample programmes are shown below for guidance only.

Science/Arts
Normally the combined degree programme would be pursued as in either (a) or (b):

(a) Year I Four Science Part I subjects passed with an average performance of credit level or higher.
Year II Three Science Part II subjects and an additional subject which will be an Arts Group I Part I subject if no Arts Group I subject has been passed.
Year III At least one Science Part III subject and two other subjects including an Arts Group I Part II subject if no Arts Group I Part II subject has so far been passed. At the end of Year III students must have passed at least three Arts Group I subjects.
Year IV One subject which is an Arts Group I Part III subject if this requirement has not already been met (and is from a department different from that of the Science Part III subject) and two other subjects to complete the Requirements for the degree of Bachelor of Arts.

(b) Year I Four Arts Part I subjects passed with an average performance of credit level or higher.
Year II Three Arts Part II subjects and an additional subject which will be a Part I subject chosen from the B.Sc. Schedule if no subject included in that Schedule has been passed.
Year III At least one Arts Part III subject and two other subjects including a Science Part II subject if no Science Part II subject has so far been passed. By the end of this year at least three subjects from the B.Sc. Schedule of Subjects must be passed.
Year IV One subject, which is a Science Part III subject if this requirement has not already been met (and is from a department different from that providing the Arts Part III subject), and two other subjects to complete the Requirements for the degree of Bachelor of Science.

Science/Mathematics
Normally the combined degree programme would be pursued as follows:
Year I Mathematics I and three Part I subjects passed with an average performance of credit level or higher.
Year II Three Part II subjects including Mathematics II A and Mathematics II C, and another Part I subject.
Year III Mathematics III A plus two other subjects which must include at least one Part III subject.
Year IV Either Mathematics III B or a schedule B subject from the requirements for B.Math, plus two other subjects which will complete the requirements for the Science degree.

Science/Engineering
See details in Faculty of Engineering Handbook

Description of Subjects
GUIDE TO SUBJECT ENTRIES
Subject outlines and reading lists are set out in a standard format to facilitate easy reference. An explanation is given below of some of the technical terms used in this Handbook.

1. (a) Prerequisites are subjects which must be passed before a candidate enrolls in a particular subject.
   (b) Where a subject is marked Advisory it refers to a pass in the Higher School Certificate. In such cases lectures will be given on the assumption that a pass has been achieved at the level indicated.
   (c) Preparatory subjects are those which candidates are strongly advised to have completed before enrolling in the subject for which the preparatory subject is recommended.
2. Corequisites refer to subjects or topics which the candidate must either pass before enrolling in the particular subject or be taking concurrently.
3. Texts are books recommended for purchase.
4. References are books relevant to the subject or topic which need not be purchased.

Note regarding SM III
Entry to Mathematics subjects at the part III level requires successful completion of two full Mathematics subjects at the part II level. In order to increase the range of choice available to students in the Faculty of Science at the part II level, a special Science subject has been introduced at the part III level, which will allow students in the Faculty of Science to choose topics from the List of Topics for Part III Mathematics, after successful completion of only one Mathematics subject at the part II level. This subject, SM III, will consist of 4 topics suitably chosen from the List of Topics for Part III Mathematics and will count as a full Science subject at the part III level. The subject SM III will in general provide mathematical backup to other Science subjects chosen at the part III level, so that students intending to enrol in SM III should discuss their choice of topics from the List of Topics for Part III Mathematics with the Head of the Department in the Faculty of Science offering the other part III subject.

663500 SM III (Calculus, Differential Equations and Related Topics)
Prerequisites Mathematics IIA or IIB plus a Part II subject offered by a Department in the Faculty of Science.
Co-requisite A Part III subject offered by a Department in the Faculty of Science. (This condition is to be suitably interpreted in the case of part-time students taking two years to complete their third year requirements for the degree).
Hours 4 lecture hours plus 2 tutorial hours per week.
Examination Each topic will be examined separately.

Content
Four topics chosen from the list of Part III topics offered by the Department of Mathematics, Statistics and Computer Science, having regard to topic prerequisites and approved by the Head of the Department offering the co-requisite subject, and the Head of the Department of Mathematics, Statistics and Computer Science. For list see Subject Computer numbers at the end of this Handbook. For further information see under "Mathematics, Statistics and Computer Science" in this book. For details of topics see Faculty of Mathematics Handbook.
Prerequisites

Students intending to study in the biological sciences are advised that facility with Chemistry is desirable. H.S.C. Chemistry or 4-unit Science is appropriate, and students are advised to include Chemistry I in their university programme. However, a series of 10 lectures in background chemistry will be offered during orientation week (16th to 20th February, 1987, between 16.00 a.m. and 12.00 noon each day in the Department of Biological Sciences lecture theatre, JLG08) for those students enrolling in Biology I who have done little chemistry. Attendance at the lectures is optional.

Hours

3 lecture hours and 3 hours of laboratory classes per week. A compulsory two-day excursion will be held in the May vacation.

Examination

Three 2-hour papers

Content

The course is organized into 3 units

UNIT 1

Cell Biology (C. E. Offler)

Theme: The evolution and functional organization of cells.

Topics:

- Biological molecules — the structure of proteins, carbohydrates and lipids.
- Cell organization — emphasis on organelle ultrastructure and principal function.
- Biological energy processes — photosynthesis, cellular respiration.
- Evolution of cells.

Plant Diversity and Processes (C. E. Offler)

Theme: Plant diversity as a consequence of adaptation for survival in a range of environments.

Topics:

- The major plant groups and their life cycles.
- Higher plant structure and function.
- Growth and differentiation.
- Control of plant development.

UNIT 2

Animal Diversity — Form and Function (J. C. Rodger)

Theme: The variety of structural and functional adaptations which have allowed animals to exploit the wide range of available environments.

Topics:

- The Animal Phyla — organization of tissues and organs, body plan, body cavities, patterns of development.
- Animal Function — digestion, circulation, respiration, integration and control, homeostasis, reproduction and development.

UNIT 3

Genetics (B. Boettcher)


Population Biology (B. A. Conroy)

An introduction to ecology, population genetics and evolution.

Prerequisites for each subject

Biology I

Hours for each subject

3 lecture hours and 6 hours tutorial and laboratory classes per week. There will be a two-day excursion for the topic Population Dynamics.

Examination for each subject

Three 2-hour papers
712105 Animal Physiology (R. C. Jones)

Content
Consideration of the processes involved in the transport of oxygen in mammals and emphasizing the relation between structure and function. The course examines molecule, cell and tissue structure and function, particularly of nerve and muscle, the respiratory and cardiovascular systems, comparative energetics and control systems.

References
Prosor, C. L., Comparative Animal Physiology 3rd edn (Saunders 1973)
Ruch, T. C. & Patton, H. D., Physiology and Biophysics II. Circulation Repiration and Fluid Balance. 20th edn (Saunders 1974)

712103 Biochemistry (R. N. Murdoch)

Content

Text
Lehninger, A. L., Principles of Biochemistry (Worth 1982)

References

712102 Cell Biology (T. K. Roberts and R. J. Rose)

Content
Cellular organization and inter-relationships. Organelles, their structure and function. Cellular processes.

Reference

712104 Molecular Genetics (B. Boettcher & R. J. Rose)

Content

Texts
Strickberger, M. W., Genetics 3rd edn (Macmillan/Collier 1985)

References

712106 Plant Physiology (J. W. Patrick)

Content
Molecular and cellular biology of photosynthesis, nitrogen fixation, plant cell growth and differentiation, plant cell water relations and solute transfer.

Text

712107 Population Dynamics (B. A. Conroy)

Content
Physical and biological factors influencing the abundance and distribution of organisms. Theories of population and control.

Text
Krebs, C. J., Ecology 3rd edn (Harper & Row)

References
Pianka, E. R., Evolutionary Ecology (Harper & Row)
Recker, H., Lunney, D., & Dunn, I. (eds), A Natural Legacy (Pergamon Press 1979)

713100 BIOLOGY IIIA
713200 BIOLOGY IIIB

Two third year subjects are offered, Biology IIIA and Biology IIIB. Biology IIIA consists of any 3 of 8 topics listed below and Biology IIIB consists of any 3 of the remaining topics. Not all topics are available each year.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Prerequisite for topic</th>
<th>Year Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Processes</td>
<td>Biochemistry</td>
<td>Yes</td>
</tr>
<tr>
<td>Ecological and Evolution</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Environmental Plant</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Physiology</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Immunology</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Mammalian Development</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Molecular Biology of Plant Development</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Plant Structure and Function</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Reproductive Physiology</td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>
*Prerequisite for each subject* A Biology II subject and any specific topics listed below.

**Hours for each subject** 4 lecture hours and 8 tutorial and laboratory classes per week.

**Examination for each subject** Three 2-hour papers.

### 713104 Cell Processes (R. N. Murdoch)

**Content**
Biochemical and cellular aspects of mammalian hormones will be considered together with their role in homeostasis. The biochemistry of blood and the digestion and absorption of foodstuffs will also be major topics for consideration.

**References**

### 713207 Ecology and Evolution (B. A. Conroy)

**Content**
Structure and dynamics of biological communities. Population genetics and evolutionary ecology. The majority of the practical component of the topic will be undertaken on two excursions.

**Text**

**References**
- Strickberger, M. W., *Genetics* 3rd edn (Macmillan Collier 1985)

### 713110 Environmental Plant Physiology (J. W. Patrick)

**Content**
The operation of key physiological processes including photosynthesis, mineral ion acquisition and assimilate transfer. Responses to environmental perturbations.

**References**

### 713105 Immunology (T. K. Roberts)

**Content**
Molecular and cellular aspects. Emphasis will be on understanding at a molecular level the function of the mammalian immune system. The course will extend into phylogeny, reproductive immunology and tumour immunology.
I PRINCIPAL DATES 1987

(See separate entry for Faculty of Medicine)

January
1 Thursday
9 Friday
14 Wednesday
23 Friday
26 Monday
31 Thursday

February
4 Wednesday
6 Friday
10 Tuesday
16 Monday
17 Tuesday
23 Monday

April
17 Friday
22 Wednesday
25 Saturday
27 Monday

May
1 Friday
18 Monday
22 Friday
23 Monday

June
8 Monday
12 Friday
29 Monday
30 Tuesday

July
10 Friday

August
10 Monday
14 Friday
17 Monday
21 Friday

September
7 Monday
28 Monday

Public Holiday — New Year's Day
Closed date for applications for re-enrolment
Deferred examinations begin
Public Holiday — Australia Day
Closing date for applications for residence in
Edwards Hall
New students attend in person to enrol and pay
Re-enrolment approval sessions for re-enrolling
Late enrolment session for new students
First term begins
Good Friday — Easter recess commences
Lectures resume
Public Holiday — Anzac Day
Last day for withdrawal without academic penalty
from first half year subjects
(See page (ix) for Dean's discretion)
First term ends
Examinations begin
Examinations end
Second term begins
Public Holiday — Queen's Birthday
Last day for return of confirmation of enrolment
forms
Closing date for applications for selection to the
Bachelor of Medicine course in 1988
Examinations end
Last day for withdrawal without academic penalty
from full year subjects
(See page (ix) for Dean's discretion)
Second term ends
Examinations begin
Examinations end
Third term begins
Last day for withdrawal without academic penalty
from second half year subjects
(See page (ix) for Dean’s discretion)

I PRINCIPAL DATES 1987

(See separate entry for Faculty of Medicine)

January
1 Thursday
9 Friday
14 Wednesday
23 Friday
26 Monday
31 Thursday

February
4 Wednesday
6 Friday
10 Tuesday
16 Monday
17 Tuesday
23 Monday

April
17 Friday
22 Wednesday
25 Saturday
27 Monday

May
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18 Monday
22 Friday
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29 Monday
30 Tuesday

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forms
Closing date for applications for selection to the
Bachelor of Medicine course in 1988
Examinations end
Last day for withdrawal without academic penalty
from full year subjects
(See page (ix) for Dean’s discretion)
Second term ends
Examinations begin
Examinations end
Third term begins
Last day for withdrawal without academic penalty
from second half year subjects
(See page (ix) for Dean’s discretion)
### TERM DATES FOR THE B.MED. PROGRAMME 1987

#### Year I

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Feb. 23 — May 1</th>
<th>10 week term including Easter break (17/4/87 to 21/4/87)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacation</td>
<td>May 4 — May 22</td>
<td>9 week term 25/5/87 to 24/7/87</td>
</tr>
<tr>
<td>Term 2</td>
<td>May 25 — Aug. 14</td>
<td>1 week consolidation 27/7/87 to 31/7/87</td>
</tr>
<tr>
<td>Vacation</td>
<td>Aug. 17 — Aug. 28</td>
<td>2 week mini-elective 3/8/87 to 14/8/87</td>
</tr>
<tr>
<td>Term 3</td>
<td>Aug. 31 — Nov. 20</td>
<td>9 week term 31/8/87 to 30/10/87</td>
</tr>
<tr>
<td>Vacation</td>
<td>June 29 — July 3</td>
<td>1 week consolidation 2/11/87 to 6/11/87</td>
</tr>
<tr>
<td>Term 4</td>
<td>July 6 — Aug. 28</td>
<td>2 week assessment period 9/11/87 to 20/11/87</td>
</tr>
<tr>
<td>Vacation</td>
<td>Aug. 31 — Oct. 9</td>
<td>6 week term</td>
</tr>
<tr>
<td>Term 5</td>
<td>Oct. 12 — Nov. 27</td>
<td>6 week term</td>
</tr>
<tr>
<td>Term 6</td>
<td>Nov. 23 — Nov. 27</td>
<td>1 week term</td>
</tr>
</tbody>
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#### Year II

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Feb. 23 — May 1</th>
<th>10 week term including Easter break (17/4/87 to 21/4/87)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacation</td>
<td>May 4 — May 22</td>
<td>9 week term 25/5/87 to 24/7/87</td>
</tr>
<tr>
<td>Term 2</td>
<td>May 25 — Aug. 14</td>
<td>1 week consolidation 27/7/87 to 31/7/87</td>
</tr>
<tr>
<td>Vacation</td>
<td>Aug. 17 — Aug. 28</td>
<td>2 week mini-elective 3/8/87 to 14/8/87</td>
</tr>
<tr>
<td>Term 3</td>
<td>Aug. 31 — Nov. 20</td>
<td>9 week term 31/8/87 to 30/10/87</td>
</tr>
<tr>
<td>Vacation</td>
<td>June 29 — July 3</td>
<td>1 week consolidation 2/11/87 to 6/11/87</td>
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<tr>
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<td>July 6 — Aug. 28</td>
<td>2 week assessment period 9/11/87 to 20/11/87</td>
</tr>
<tr>
<td>Vacation</td>
<td>Aug. 31 — Oct. 9</td>
<td>6 week term</td>
</tr>
<tr>
<td>Term 5</td>
<td>Oct. 12 — Nov. 27</td>
<td>6 week term</td>
</tr>
<tr>
<td>Term 6</td>
<td>Nov. 23 — Nov. 27</td>
<td>1 week term</td>
</tr>
</tbody>
</table>

#### Year III

<table>
<thead>
<tr>
<th>Term 1</th>
<th>Feb. 9 — April 16</th>
<th>10 week term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easter vacation</td>
<td>Apr. 17 — Apr. 24</td>
<td>8 week term</td>
</tr>
<tr>
<td>Term 2</td>
<td>April 27 — June 19</td>
<td>8 week term</td>
</tr>
<tr>
<td>Vacation</td>
<td>June 22 — June 26</td>
<td>8 week term</td>
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<tr>
<td>Term 3</td>
<td>June 29 — Aug. 21</td>
<td>8 week term</td>
</tr>
<tr>
<td>Review</td>
<td>Aug. 24 — Aug. 28</td>
<td>8 week term</td>
</tr>
<tr>
<td>(All students in Newcastle)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stuvac</td>
<td>Aug. 31 — Sept. 4</td>
<td>1 week</td>
</tr>
<tr>
<td>Assessment</td>
<td>Sept. 7 — Sept. 25</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Vacation</td>
<td>Sept. 28 — Oct. 9</td>
<td>2 weeks</td>
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<tr>
<td>(Note: second assessments will be held during this period)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective term</td>
<td>Oct. 12 — Dec. 4</td>
<td>8 week term</td>
</tr>
<tr>
<td>Third Assessments</td>
<td>Dec. 7 — Dec. 11</td>
<td></td>
</tr>
</tbody>
</table>
II GENERAL INFORMATION

ADVICE AND INFORMATION
Advice and information on matters concerning the Faculties of the University can be obtained from a number of people.

Faculty Secretaries
For general enquiries about University regulations, Faculty rules and policies, studies within the University and so on, students may consult:

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Secretary</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>Ms Dianne Oughton</td>
<td>685711</td>
</tr>
<tr>
<td>Arts</td>
<td>Mr Peter Day</td>
<td>6853296</td>
</tr>
<tr>
<td>Economics &amp; Commerce</td>
<td>Mrs Linda Harrigan</td>
<td>685695</td>
</tr>
<tr>
<td>Education</td>
<td>Mr Peter Day</td>
<td>685296</td>
</tr>
<tr>
<td>Engineering</td>
<td>Mr Geoff Gordon, or</td>
<td>685630</td>
</tr>
<tr>
<td></td>
<td>Mrs Dianne Oughton</td>
<td>685711</td>
</tr>
<tr>
<td>Mathematics</td>
<td>Ms Helen Hotchkiss</td>
<td>685565</td>
</tr>
<tr>
<td>Mathematics (Science)</td>
<td>Mr Brian Kelleher</td>
<td>685613</td>
</tr>
<tr>
<td>Science</td>
<td>Ms Helen Hotchkiss</td>
<td>685565</td>
</tr>
</tbody>
</table>

All Faculty Secretaries except for Mr Kelleher (Science) and Mr Gordon (Engineering) are located in the McMullin Building on the Ground Floor (northern end) in the Student Administration Office. Faculty Secretary for Medicine is located in room 607A in the Medical Sciences Building. Faculty Secretary for Engineering (Mr G. Gordon) is located in EA209, Engineering Buildings.

For enquiries regarding particular studies within a faculty or department Sub-deans, Deans or Departmental Heads (see staff section) should be contacted.

CASHIER'S OFFICE
1st Floor McMullin Building.
Hours 10 a.m. — 12 noon and 2 p.m. — 4 p.m.

ACCOMMODATION OFFICE — Mrs Kath Dacey, phone 685520
located in the temporary buildings opposite Mathematics.

CAREERS AND STUDENT EMPLOYMENT OFFICE — Mr Hugh Floyer, phone 685466
located in the temporary buildings opposite Mathematics.

COUNSELLING SERVICE — phone 685255 or 685501
located on the Lower Ground Floor (northern end) of the McMullin Building.

ENROLMENT OF NEW STUDENTS
Persons offered enrolment are required to attend in person at the Great Hall early in February to enrol and pay charges. Detailed instructions are given in the Offer of Enrolment.

TRANSFER OF COURSE
Students currently enrolled in an undergraduate Bachelor degree course who wish to transfer to a different undergraduate Bachelor degree course must complete an Application for Course Transfer form and lodge it with their Application for Re-enrolment at the Student Administration Office by 9 January 1987.

RE-ENROLMENT BY CONTINUING STUDENTS
There are four steps involved in re-enrolment by continuing students:

1. Collection of the re-enrolment kit
2. Lodging the Application for Re-enrolment form with details of your proposed programme
3. Attendance at the Great Hall for enrolment approval, and payment of the General Service Charge.

(Students who are in research higher degree programmes re-enrol and pay charges by mail).

Re-enrolment Kits
Re-enrolment kits will be available for collection from 20 to 24 October 1986 from the Tanner Room, Level Three University Union and thereafter from the Student Administration Office in the McMullin Building. The re-enrolment kit contains the student's Application for Re-enrolment form, the 1987 Class Timetable, the Statement of Charges Payable for 1987 and re-enrolment instructions.

Lodging Application for Re-enrolment forms
The Application for Re-enrolment form must be completed carefully and lodged at the Student Administration Office by 9 January 1987. It can be lodged in November or December, but in general students should know their examination results before completing the form. There is no late charge payable if the form is late, but it is very important that the Application for Re-enrolment form is lodged by 9 January 1987 as late lodgement will mean that enrolment approval will not be possible before the late re-enrolment session to the disadvantage of the student.

Enrolment Approval
All re-enrolling students are required to attend at the Great Hall on a specific date and time during the period 10-16 February 1987. Enrolment Approval dates are on posters on University Noticeboards and are included in the enrolment kits issued to students in October. When attending for Enrolment Approval students will collect their approved 1987 programme and student card. Any variations to the proposed programme must be clarified and submitted for approval. Enrolments in tutorial or laboratory sessions will be arranged. Staff from academic Departments will be available to answer enquiries. Fare concessions forms will also be issued, providing the General Services Charge has been paid.

A service charge of $10 will be imposed on students who re-enrol after the specified date.

Payment of Charges
The re-enrolment kit issued to re-enrolling students includes a Statement of Charges Payable form which must accompany the payment of charges for 1987. These charges may be paid at any time after receiving the re-enrolment kit.

All charges, including debts outstanding to the University, must be paid before or upon re-enrolment — part payment of total amount due will not be accepted by the cashier.

Payment by mail is encouraged; alternatively by cheque or money order lodged in the internal mail deposit box in the foyer of the McMullin Building. The receipt will be mailed to the student.

Payment by cash at the Cashier's Office may lead to queues at enrolment time.

The Cashier's Office will be open for extended hours during the enrolment approval sessions in the period 9-16 February 1987. Afterwards any further payment should be by mail only.

LATE PAYMENT
Payment of the General Services Charge is due before or upon re-enrolment. The final date for payment is the date of the Re-enrolment Approval session for the course concerned in the period 9-16 February 1987, after which a late charge applies at the rate of:

- $10 if payment is received up to and including 7 days late;
- $20 if payment is received between 8 and 14 days late; or
- $30 if payment is received 15 or more days late.

Thereafter enrolment will be cancelled if charges remain unpaid.

STUDENT CARDS
When attending for Enrolment Approval, students will be given their Approved Programme form which incorporates the Student Card. The Student Card is machine readable for use when borrowing books from the University Library, and contains the student's interim password for access to facilities of the Computing Centre.
Students are urged to take good care of their Student Card. If the card is lost or destroyed, there is a service charge of $5 payable before the card will be replaced. A student who withdraws completely from studies should return the Student Card to the Student Administration Office.

RE-ADMISSION AFTER ABSENCE
A person wishing to resume an undergraduate degree course who has been enrolled previously at the University of Newcastle, but not enrolled in 1986, is required to apply for admission again through the Universities and Colleges Admissions Centre, Box 7049 G.P.O., Sydney. Application forms may be obtained from the UCAC or from the Student Administration Office and must be returned to the UCAC by 1 October each year. There is a $40 fee for late applications.

ATTENDANCE STATUS
A student who withdraws completely from studies should return the Student Card to the Student Administration Office.

Application for re-admission to undergraduate degree courses must be made through the UCAC (see p.vi).

CHANGE OF ADDRESS
Students are responsible for notifying the Student Administration Office in writing of any change in their address. A Change of Address form should be used and is available from the Student Administration Office. Failure to notify changes could lead to important correspondence or course information not reaching the student. The University cannot accept responsibility if official communications fail to reach a student who has not notified the Student Administration Office of a change of address.

It should be noted that examination results will be available for collection in the Drama Workshop in mid-December. Results not collected will be mailed to students. Students who will be away during the long vacation from the address given to the University for correspondence should make arrangements to have mail forwarded to them.

CHANGE OF NAME
Students who change their name should advise the Student Administration Office. Marriage, deed poll or naturalisation etc. certificates should be presented for sighting in order that the change can be noted on University records.

CHANGE OF PROGRAMME
Approval must be sought for any changes to the programme for which a student has enrolled. This includes adding or withdrawing subjects, changing attendance status (for example from full-time to part-time) or transferring to a different degree or faculty. All proposed changes should be entered on the Variation of Programme form available at the Student Administration Office. Reasons for changes and where appropriate documentary evidence in the form of medical or other appropriate certificates must be submitted.

WITHDRAWAL
Application to withdraw from a subject should be made on a Variation of Programme form and lodged at the Student Administration Office or mailed to the Secretary. Applications received by the appropriate date listed below will be approved for withdrawal without a failure being recorded against the subject or subjects in question.

Withdrawal after the above dates will normally lead to a failure being recorded against the subject or subjects unless the Dean of the Faculty grants permission for the student to withdraw without a failure being recorded.

If a student believes that a failure should not be recorded because of the circumstances leading to his or her withdrawal, it is important that full details of these circumstances be provided with the application to withdraw.

CONFIRMATION OF ENROLMENT
In May each year the University mails to all students a Confirmation of Enrolment form which also serves as the application to sit for examinations. This form must be checked carefully, signed and returned by all students (including non-degree students and postgraduate students not taking formal subjects) to confirm that they are actively pursuing subjects for which they are enrolled and that the information on University records is correct and complete.

INDEBTNESS
The Council of the University has directed that students who are indebted to the University because of unpaid charges, library fines or parking fines may not — receive a transcript of academic record; or — graduate or be awarded a Diploma.

Students are requested to pay any debts incurred without delay.

LEAVE OF ABSENCE
A student who does not wish to re-enrol for any period up to three years should write to The Secretary and ask for leave of absence. Leave of absence is normally granted only to those students who are in good standing. Applications should be submitted before the end of first term in the first year for which leave of absence is sought. Leave of absence will not be granted for more than three years and will not be granted retrospectively.

In the case of the B.Med. degree the following applies:

- at the completion of an academic year, a candidate whose performance is deemed by the Faculty Board to be satisfactory may be granted leave of absence under such conditions as the Faculty Board may determine. Such leave will not normally be granted for more than one year.

Application for re-admission to undergraduate degree courses must be made through the UCAC (see p.vi).

ATTENDANCE AT CLASSES
Where a student's attendance or progress has not been satisfactory, action may be taken under the Regulations Governing Unsatisfactory Progress.

In the case of illness or absence for some other unavoidable cause, a student may be excused for non-attendance at classes.

All applications for exemption from attendance at classes must be made in writing to the Head of the Department offering the subject. Where tests or term examinations have been missed, this fact should be noted in the application.

The granting of an exemption from attendance at classes does not carry with it any waiver of the General Services Charge.

GENERAL CONDUCT
In accepting membership of the University, students undertake to observe the by-laws and other requirements of the University.

Students are expected to conduct themselves at all times in a seemly fashion. Smoking is not permitted during lectures, in examination rooms or in the University Library. Gambling is forbidden.

Members of the academic staff of the University, senior administrative officers, and other persons authorised for the purpose have authority to report on disorderly or improper conduct occurring in the University.
NOTICES
Official University notices are displayed on the notice boards and students are expected to be acquainted with the contents of those announcements which concern them.

A notice board on the wall opposite the entrance to Lecture Theatre B is used for the specific purpose of displaying examination time-tables and other notices about examinations.

STUDENT MATTERS GENERALLY
The main notice board is the display point for notices concerning enrolment matters, scholarships, University rules and travel concessions, etc. This notice board is located on the path between the Union and the Library.

III EXAMINATIONS
Tests and assessments may be held in any subject from time to time. In the assessment of a student's progress in a university course, consideration will be given to laboratory work, tutorials and assignments and to any term or other tests conducted throughout the year. The results of such assessments and class work may be incorporated with those of formal written examinations.

EXAMINATION PERIODS
 Formal written examinations take place on prescribed dates within the following periods:

- **End of First Term:** 17 to 21 August, 1987
- **Mid Year:** 29 June to 10 July, 1987
- **End of Second Term:** 17 to 21 August, 1987
- **End of Year:** 9 to 27 November, 1987

Timetables showing the time and place at which individual examinations will be held will be posted on the examinations notice board near Lecture Theatre B (opposite the Great Hall).

Misreading of the timetable will not under any circumstances be accepted as an excuse for failure to attend an examination.

SITTING FOR EXAMINATIONS
Formal examinations, where prescribed, are compulsory. Students should consult the final timetable in advance to find out the date, time and place of their examinations and should allow themselves plenty of time to get to the examination room so that they can take advantage of the 10 minutes reading time that is allowed before the examination commences. Formal examinations are usually held in the Great Hall area and (in November) the Auchmuty Sports Centre. The seat allocation list for examinations will be placed on the Noticeboard of the Department running the subject, and on a noticeboard outside the examination room.

Students can take into any examination any writing instrument, drawing instrument or calculating instrument. Logarithmic tables may not be taken in: they will be available from the supervisor if needed.

Calculators may be used, if permitted by the examiner in any examination. They must be hand held, battery operated and non-programmable* and students should note that no concession will be granted:

- (a) to a student who is prevented from entering a room a programmable calculator;
- (b) to a student who uses a calculator incorrectly; or
- (c) because of battery failure.

*R A programmable calculator will be permitted provided program cards and devices are not taken into the examination room.

RULES FOR FORMAL EXAMINATIONS
Regulation 15 of the Examination Regulations sets down the rules for formal examinations, as follows:

- (a) candidates shall comply with any instructions given by a supervisor relating to the conduct of the examination;
- (b) before the examination begins candidates shall not read the examination paper until granted permission by the supervisor which shall be given ten minutes before the start of the examination;
- (c) no candidate shall enter the examination room after thirty minutes from the time the examination has begun;
- (d) no candidate shall leave the examination room during the first thirty minutes or the last ten minutes of the examination;
- (e) no candidate shall re-enter the examination room after he has left it unless during the full period of his absence he has been under approved supervision;
- (f) a candidate shall not bring into the examination room any bag, paper, book, written material, device or aid whatsoever, other than such as may be specified for the particular examination;
- (g) a candidate shall not by any means obtain or endeavour to obtain improper assistance in his work, give or endeavour to give assistance to any other candidate, or commit any breach of good order;
- (h) a candidate shall not take from the examination room any examination answer book, graph paper, drawing paper or other material issued to him for use during the examination;
- (i) no candidate may smoke in the examination room.

Any infringement of these rules constitutes an offence against discipline.

EXAMINATION RESULTS
Examination results and re-enrolment papers will be available for collection from the Drama Studio in December. The dates for collection will be put on noticeboards outside the main examination rooms in November.

Results not collected will be mailed.

No results will be given by telephone.

After the release of the annual examination results a student may apply to have a result reviewed. There is a charge of $8.00 per subject, which is refundable in the event of an error being discovered. Applications for review must be submitted on the appropriate form together with the prescribed review charge by 15 January 1988

However, it should be noted that examination results are released only after careful assessment of students' performances and that, amongst other things, marginal failures are reviewed before results are released.

SPECIAL CONSIDERATION
All applications for special consideration should be made in writing to the Secretary explaining the circumstances. Relevant evidence should be attached to the application (see Regulation 12(2) of the Examination Regulations, Calendar Volume 1). Also refer to Faculty Policy.

If a student is affected by illness during an examination and wishes to ask for special consideration, he or she must report to the supervisor in charge of the examination and then make written application to the Secretary within three days of the examination (see Regulation 12(3) of the Examination Regulations, Calendar Volume 1). Also refer to Faculty Policy.

Applicants for special consideration should note that a Faculty Board is not obliged to grant a special examination. The evidence presented should state the reason why the applicant was unable to attend an examination or how preparation for an examination was disrupted. If the evidence is in the form of a medical certificate the Doctor should state the nature of the disability and specify that the applicant was unfit to attend an examination on a particular day or could attend but that the performance of the applicant would be affected by the disability. If the period of disability extends beyond one day the period should be stated. (x)
IV UNSATISFACTORY PROGRESS

The University has adopted Regulations Governing Unsatisfactory Progress which are set out below.

Students who become liable for action under the Regulations will be informed accordingly.

The Faculty's progress requirements are set out elsewhere in this volume.

REGULATIONS GOVERNING UNSATISFACTORY PROGRESS

1. (1) These Regulations are made in accordance with the powers vested in the University by law 5.1.2.

(2) These Regulations shall apply to all students of the University except those who are candidates for a degree of Master or Doctor.

(3) In these Regulations, unless the context otherwise indicates or requires:

"Admissions Committee" means the Admissions Committee of the Senate constituted under By-law 2.3.5;

"Dean" means the Dean of a Faculty in which a student is enrolled.

"Faculty Board" means the Faculty Board of a Faculty in which a student is enrolled.

2. (1) A student's enrolment in a subject may be terminated by the Head of the Department offering that subject if that student does not maintain a rate of progress considered satisfactory by the Head of the Department. In determining whether a student is failing to maintain satisfactory progress the Head of Department may take into consideration such factors as:

(a) unsatisfactory attendance at lectures, tutorials, seminars, laboratory classes or field work;

(b) failure to complete laboratory work;

(c) failure to complete written work or other assignments; and

(d) failure to complete field work.

(2) The enrolment of a student in a subject shall not be terminated pursuant to regulation 2 (1) of these Regulations unless he has been given prior written notice of the intention to consider the matter with brief particulars of the grounds for so doing and has also been given a reasonable opportunity to make representations either in person or in writing or both.

3. (1) A student whose enrolment in a subject is terminated under regulation 2 (1) of these Regulations may appeal to the Faculty Board which may determine the matter.

4. (1) A Faculty Board may review the academic performance of a student who does not maintain a rate of progress considered satisfactory by the Faculty Board and may determine:

(a) that the student be permitted to continue the course;

(b) that the student be permitted to continue the course subject to such conditions as the Faculty Board may determine;

(c) that the student be excluded from further enrolment;

(i) in the course; or

(ii) in the course and any other course offered in the Faculty;

(ii) or

(iii) in the Faculty; or

(d) if the Faculty Board considers its powers to deal with the case are inadequate, that the case be referred to the Admissions Committee together with a recommendation for such action as the Faculty Board considers appropriate.

2. Before a decision is made under regulation 3 (1) (b) or (d) of these Regulations the student shall be given an opportunity to make representations with respect to the matter, either in person or by writing or both.

3. A student may appeal against any decision made under regulation 3 (1) (b) or (c) of these Regulations to the Admissions Committee which shall determine the matter.

4. Where the progress of a student who is enrolled in a combined course or who has previously been excluded from enrolment in another course or Faculty is considered by the Faculty Board to be unsatisfactory, the Faculty Board shall refer the matter to the Admissions Committee together with a recommendation for such action as the Faculty Board considers appropriate.

5. (1) An appeal made by a student to the Admissions Committee pursuant to Regulation 3 (3) of these Regulations shall be in such form as may be prescribed by the Admissions Committee and shall be made within fourteen (14) days from the date of posting to the student of the notification of the decision or such further period as the Admissions Committee may accept.

(2) In hearing an appeal the Admissions Committee may take into consideration any circumstances whatsoever including matters not previously raised and may seek such information as it thinks fit concerning the academic record of the appellant and the making of the determination by the Faculty Board. Neither the Dean nor the sub-Dean shall act as a member of the Admissions Committee on the hearing of any such appeal.

6. The Faculty Board may substitute for any other decision which the Faculty Board is empowered to make pursuant to these Regulations.

6. (1) The Admissions Committee shall consider any case referred to it by a Faculty Board and may:

(a) make any decision which the Faculty Board itself could have made pursuant to regulation 3 (1) (a) (b) or (c) of these Regulations; or

(b) exclude the student from enrolment in such other subjects, courses, or Faculties as it thinks fit; or

(c) exclude the student from the University.

7. The Committee shall not make any decision pursuant to regulation 6 (1) (b) or (c) of these Regulations unless it has first given to the student the opportunity to be heard in person by the Committee.

8. A student may appeal to the Vice-Chancellor against any decision made by the Admissions Committee under this Regulation.

9. Where there is an appeal against any decision of the Admissions Committee made under Regulation 6 of these Regulations, the Vice-Chancellor may refer the matter back to the Admissions Committee with a recommendation or shall arrange for the appeal to be heard by the Council. The Council may confirm the decision of the Admissions Committee or may substitute for it any other decision which the Admissions Committee is empowered to make pursuant to these Regulations.

10. (1) A student who has been excluded from further enrolment in a Faculty may enrol in a course in another Faculty only with the permission of the Faculty Board of that Faculty and on such conditions as it may determine after considering any advice from the Dean of the Faculty from which the student was excluded.

(2) A student who has been excluded from further enrolment in any course, Faculty or from the University under these regulations may apply for
The General Services Charge (details below) is payable by all students. New undergraduate students are required to pay all charges when they attend to enrol. Re-enrolling students receive in October each year, as part of their re-enrolment kit, a statement of charges payable. Students are expected to pay charges in advance of re-enrolment and payment by mail is requested. The last date for payment of charges without incurring a late charge is the date of the Re-enrolment Approval session for the particular course (in the period 9-16 February 1987).

### CHARGES

1. **General Services Charge**
   - (a) Students Proceeding to a Degree or Diploma .............. $179
   - (b) Non-Degree Students, Newcastle University Union charge ............... $80
   - **Per annum**

2. **Late Charges**
   - Where the Statement of Charges payable form is lodged with all charges payable after the due date
     - if received up to and including 7 days late ......................... $10
     - if received between 8 and 14 days late .......................... $20
     - if received 15 or more days late ................................ $30

3. **Other Charges**
   - (a) Examination under special supervision .................. $15 per paper
   - (b) Administration charge for non-members of the University ............... $8
   - (c) Replacement of Re-enrolment kit .............................. $10
   - (d) Replacement of Student Card ................................ $5

4. **Higher Education Administration Charge** ................. $250

5. **Indebted Students**
   - All charges, including debts outstanding to the University, must be paid before or upon re-enrolment — part payment of total amount due will not be accepted by the cashier.

### HIGHER EDUCATION ADMINISTRATION CHARGE

Subject to certain exemptions listed below, the charge will apply uniformly to students in universities and colleges of advanced education undertaking full award courses, or courses or individual subjects which could form part of a higher education award. The charge will apply to students enrolling on a full-time, part-time or external basis and will be imposed at the time of enrolment.

The following categories of students will be exempted from the charge:
- students who at the time of enrolment hold a scholarship awarded by the University, where the value of the living allowance under the scholarship exceeds $1,000 per annum, not including dependants' allowances;
- supporting parent beneficiaries;
- Class A widows; carers, and
- invalid pensioners
who are studying either full-time or part-time.

The following groups will be effectively exempted from the charge by receiving a special allowance to offset the charge:
- beneficiaries under Austudy;
- holders of an award under the Postgraduate Awards Scheme, and
- holders of Abstudy grants.

Students in this category will be reimbursed through the student allowance payments arrangements.

Overseas students who are liable for the Overseas Students Charge (OSC) will be required to pay the administration charge to the University, but the OSC calculated each year will be reduced by the amount of the administration charge.

**Assistance**
- (a) **Austudy**
  - Higher education students on Austudy allowance will receive a special payment of $250 to cover the administration charge.
- (b) **Loans**
  - Loans are available to meet urgent short term needs. These may include fees, rent, text books, etc. The loan period is normally 3-6 months but in appropriate circumstances may be taken over 12 months. Enquiries should be directed to Mr. J. Birch, Student Administration Office.

**METHOD OF PAYMENT**

Students are requested to pay charges due by mailing their cheque and the Statement of Charges Payable form to the University Cashier. The Cashier's internal mail deposit box in the foyer of the McMullin Building may also be used. Payment should be addressed to the Cashier, University of Newcastle, NSW 2308. Cheques and money orders should be payable to the University of Newcastle. Cash payment must be made at the Cashier's Office 1st Floor McMullin Building between the hours of 10 am to 12 noon or 2 pm to 4 pm.

**SCHOLARSHIP HOLDERS AND SPONSORED STUDENTS**

Students holding scholarships or receiving other forms of financial assistance must lodge with the Cashier their Statement of Charges payable form together with a warrant or other written evidence that charges will be paid by the sponsor. Sponsors must provide a separate voucher warrant or letter for each student sponsored.

**LOANS**

Students who do not have sufficient funds to pay charges should seek a loan from their bank, building society, credit union or other financial institution. Applications for a loan from the Student Loan Fund should be made to Mr. J. Birch, Student Administration Office. Arrangements should be made well in advance to avoid the risk of a late charge.
REFUND OF CHARGES
A refund of the General Services charge paid on enrolment will be made when the student notifies the Student Administration Office of a complete withdrawal from studies. (Any change of address must also be advised). A refund cheque will be mailed to the student or, if applicable, to the sponsor. The refund will be based on the date of notification of withdrawal, as follows:

Notification on or before Monday, 23 February, 1987 ................... 100%
Notification on or before Friday, 20 March, 1987 ................... 90%
Notification on or before Friday, 26 June, 1987 ................... 50%

No refund will be made before 31 March 1987.

HIGHER DEGREE CANDIDATES
Higher degree candidates are required to pay the Higher Education Administration charge and the General Services charge and Union Entrance charge, if applicable. Where the enrolment is effective from First or Second Term, the General Services charge covers the period from the first day of the term to the Friday immediately preceding the first day of First Term in the following academic year. Where enrolment is on or after the first day of Third Term, the General Services charge paid will cover liability to the end of the long vacation following the next academic year.

The Higher Education Administration charge applies to each academic year, e.g. if enrolment is on the first day of third term a charge of $250 is payable for that term. On enrolment in the subsequent years a further charge is payable for each year.

VI CAMPUS TRAFFIC AND PARKING
Persons wishing to bring motor vehicles (including motor cycles) on to the campus are required to complete a parking registration form for each vehicle. Completed forms must be lodged with the Attendant (Patrol) Office located off the foyer of the Great Hall. All persons must comply with the University's Traffic and Parking Regulations including parking in approved parking areas, complying with road signs and not exceeding 35 k.p.h. on the campus.

If the Manager, Buildings and Grounds, after affording the person a period of seven days
in which to submit a written statement is satisfied that any person is in breach of
Regulations, he may:
(a) warn the person against committing any further breach; or
(b) impose a fine; or
(c) refer the matter to the Vice-Chancellor.

The range of fines which may be imposed in respect of various categories of breach include:

Parking in areas not set aside for parking ................. up to $10
Parking in special service areas, e.g. loading bays, by fire hydrants, etc. .................. up to $15
Driving offences — including speeding and dangerous driving ......... up to $30
Failing to stop when signalled to do so by an Attendant (Patrol) ...... up to $30
Refusing to give information to an Attendant (Patrol) .................. up to $30
Failing to obey the directions of an Attendant (Patrol) ................. up to $30

The Traffic and Parking Regulations are stated in full in the Calendar, Volume I.

References
Roit, I. Essential Immunology 5th edn (Blackwell 1984)

713107 Mammalian Development (J. C. Rodger)
Theme: The development of independent function.
Topics include: Activation of the embryonic genes, cell lineages and differentiation, tissue/organ systems, implantation and placental function, defects in development, embryo manipulation, neonatal physiology, lactation.

References
Johnson, M. H. & Everitt, B. J. Essential Reproduction (Blackwell 1980)

713108 Molecular Biology of Plant Development (R. J. Rose)
Content
Regulation of plant development by three interacting genetic systems, hormones and environment. Emphasis on in vitro culture systems to study developmental processes and for genetic engineering for plant improvement.

References
Grierson, D. & Covey, S. N. Plant Molecular Biology (Blackie 1984)

713109 Plant Structure and Function (C. E. Oliffe)
Content
The development of higher plant structure from meristematic tissue. The structure/function equation for fully differentiated vegetative organs. Structural adaptations ranging from gross morphology to cell ultrastructure to maintain growth under environmental stress.

References
Burgess, I. An Introduction to Plant Cell Development (Cambridge U.P. 1985)
Esau, K. Anatomy of Seed Plants (John Wiley & Sons 1960)

713106 Reproductive Physiology (R. C. Jones)
Content
Biology of reproduction with particular emphasis on sexual differentiation and gamete physiology.

References
Johnson, M. H. & Everitt, B. J. Essential Reproduction (Blackwell 1980)
Setchell, B. P. The Mammalian Testis (Paul Elek 1978)
Department of Chemistry

72100 CHEMISTRY I

Prerequisites
Nil

Advisory Prerequisites
At least Mathematics (2-unit course), Physics (2-unit course) and Chemistry (2-unit course) with ranking in the top 50% in each case.

Hours
About 3 lecture hours and 3 hours of tutorial and laboratory classes per week.

Examination
The subject is examined progressively with three examinations each of two hours duration distributed throughout the year. The laboratory mark counts 10% towards the final grading. A pass in the laboratory course is required in order to pass the subject.

Content
Inorganic Chemistry
Revision of basic concepts; periodic properties of the elements and their compounds; bonding and structure; co-ordination compounds.

Organic Chemistry
Historical development. The shapes, structures and names of organic compounds; reactions of common functional groups; synthesis, differentiation and structural elucidation of organic compounds.

Physical Chemistry
Chemical equilibria; thermodynamics; electrochemistry; chemical kinetics.

Texts

722200 CHEMISTRY IIA

Prerequisites
Chemistry I

Preparatory Subjects
Mathematics I & either Physics 1A or 1B

Hours
About 3 lecture hours and 6 hours of tutorial and laboratory classes per week.

Examination
The subject is examined progressively with seven hours of examinations distributed throughout the year. The laboratory mark counts 20% towards the final grading. A pass in the laboratory course is required in order to pass the subject.

Content
Analytical Chemistry
Basic principles of selected range of instrumental methods of analysis.

Inorganic Chemistry
Symmetry, structure and bonding; main group chemistry; transition metal chemistry and co-ordination complexes; structure elucidation; σ acceptor complexes and organometallic compounds.

Dynamics
Kinetics; chemical affinity; electrochemical cells.

Organic Chemistry
Aliphatic and aromatic chemistry.

Thermodynamics
Basic laws, and applications to ideal and non-ideal systems.

Texts
Atkins, P. W. Physical Chemistry 2nd edn (Oxford 1982)
Purcell, K. F. & Kotz, J. C. An Introduction to Inorganic Chemistry softback edn (Holt-Saunders 1980)

Model Kit
— Orbit Molecular Model Kit (Cochranes, Oxford)

722300 CHEMISTRY IIB

This subject will not be offered in 1987.

Prerequisites
Chemistry I

Corequisites
Chemistry IIA

Hours
3 lecture hours and 6 laboratory hours per week. The subject is divided into 5 or 6 units.

Examination
One hour examination for each unit. The laboratory mark counts 20% towards the final grading. A pass in the laboratory course is required in order to pass the subject.

Content
The units offered may vary from year to year and will be listed in the Department.

Texts
To be advised
CHEMISTRY — PART III SUBJECTS

Prerequisites
Mathematics I; Chemistry II A. Chemistry III A is a pre- or corequisite for Chemistry III B.

Hours
The Chemistry Department offers two Part III subjects, each involving about one hundred hours of lectures. Associated with each subject are 8 hours per week of laboratory work.

Examination
Both subjects will be examined by progressive examinations. To pass each subject, students must achieve an acceptable aggregate mark and earn a pass grading in the specified laboratory programme. The laboratory mark counts 25% towards the final grading.

Content
Each student enrolling in Chemistry III A must select nine topics from the list provided by the Department. Likewise, students enrolling in Chemistry III B must nominate nine topics from the III B listing.

All proposed programmes must be approved by the Head of Department (or his nominee) before the start of the academic year.

Texts
To be advised: see departmental topic summaries.

724100 CHEMISTRY IV

Prerequisites
Completion of ordinary degree requirements and permission of Head of Department.

Hours
To be advised

Examination
A subject extending over one full-time academic year or its part-time equivalent, comprising:
(i) a minimum of 40 hours of lectures and tutorials, a course of directed reading and presentation of a seminar on an assigned topic;
(ii) a supervised research project, the results of which are to be embodied in a thesis and presented at a seminar.

The lecture and tutorial course will be assessed progressively, whereas the directed reading course will be examined by two papers, each of three hours duration.

Assessment of the grade of Honours to be awarded will be based on the standard achieved in the formal courses, the quality of the research project and thesis; and performance in the undergraduate programme.

Texts
To be advised

Department of Geology

731100 GEOLOGY I

Prerequisite
Nil

Hours
3 lecture hours and 2½ laboratory hours per week and 2 days field work

Examination
Two 3-hour papers, class assignments and practical examinations

Content
Planet Earth
Geology of the Solar System, evolution of the Earth, continental drift, plate tectonics.

Earth Materials
Minerals; cycles of weathering/erosion; soils; sediments; sedimentary, metamorphic and igneous rocks.

Earth History
Palaeontology; stratigraphy; geological history of Australia.

Texts
Black, R. M.
Clark, I. F. & Cook, B. J. (eds)
Ernst, W. G.

732200 GEOLOGY III A

Prerequisite
Geology I

Hours
3 lecture hours and 4 laboratory hours per week and 8 days field work which include photogrammetry and photogeology.

Examination
Two 3-hour papers, class assignments and practical examinations

Content
Mineralogy
The Elements of Palaeontology (Cambridge U.P. 1970)
Perspective of the Earth (Australian Academy of Science, 1983; Tien Wah Press)
Earth Materials (Prentice-Hall 1976)

Petrology
Rock forming minerals; nature of and crystallization from a magma; chemical equilibrium studies; petrology of igneous rock associations; petrography and classification of igneous and sedimentary rocks.

Stratigraphy and Palaeontology
Stratigraphy of Australia; invertebrate palaeontology.

Structural Geology
Concept of stress and strain; mechanical behaviour of rocks; fold mechanisms; cleavage; faulting.

Geomathematics
Elementary introduction to basic mathematics and data processing in geology.
732300 GEOLOGY II B

**Prerequisite**
Geology I

**Hours**
An average of 8 hours per week on field work and associated lectures

**Examination**
Assignments and practical examinations

**Content**
A synthesis of a portion of the Lachlan and New England Fold Belts and the Sydney Basin. The course, which comprises three weeks field work, includes field studies of weathering, mineralization, stratigraphy, palaeontology, structural geology, metamorphic petrology, igneous petrology, ore deposit geology and tectonics. Laboratory work includes photogrammetry and photogeology of field study areas.

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733100 GEOLOGY III A

**Prerequisites**
Geology I & II A

**Preparatory Subjects**
Chemistry I & either Physics 1A or 1B

**Hours**
5 lecture hours and 6 laboratory hours per week and 8 days field work. (Includes Geophysics given by visiting lecturers during term and vacation times and practical Geophysics during vacation.)

**Examination**
Two 3-hour papers, class assignments and practical examinations

**Content**

- **Petroleum**
  Petrology of igneous rock associations; petrogenesis of metamorphic rocks.

- **Sedimentology**
  Petrogenesis of sedimentary rocks.

- **Economic Geology**
  Fundamental criteria for the formation and characteristics of the principal types of metallic and non-metallic ore deposits; mineralogy and resource economics.

- **Structural Geology and Geotectonics**
  Advanced structural geology, geotectonics and tectonophysics; structural aspects of geosynclinal concept, orogenies, continental drift; global tectonics.

- **Weathering**
  The mechanisms and geochemistry of weathering with relation to palaeoclimes and their products, laterites, silcretes, ferricrete, ironstone and gossans; together with application of mineralogical techniques to their compositions e.g. XRD, XRF, AAS, IR, EDS, TG, TEM, EMPA and SEM.

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733200 GEOLOGY III B

**Prerequisites**
Geology I & II A

**Corequisite**
Geology III A

**Hours**
6 lecture hours and 6 laboratory hours per week and 4 days field work

**Examination**
Two 3-hour papers, class assignments and practical examinations

**Content**

- **Economic and Exploration Geology**
  Source, transport and precipitation of ore minerals; sulphide mineralogy, wallrock alteration; ore-forming fluids; sulphur, oxygen and lead isotopes in ore mineral genesis; fluid inclusions; geochemical environments; dispersion of metals; geochemical exploration.

- **Sedimentology**
  Lithologic associations in relation to the depositional facies of their environment of formation with emphasis on the genetic connection between the geological setting of a depositional area and its sedimentary fill (basin analysis).

- **Stratigraphic Principles**
  Stratification; top and bottom criteria; stratigraphic breaks; facies changes; factors in lithostratigraphy (rock units, lithofacies, lithosomes); catastrophic stratigraphy; uniformitarianism and the processes of sedimentation; stratigraphic nomenclature; biostratigraphic zones; correlation; stratigraphic palaeontology.

- **Coal Geology**
  Origin, distribution, classification and economic potential of coal.

- **Petroleum Geology**
  Origin, source, migration, entrapment and distribution of petroleum and gas; the exploration and exploitation techniques for its detection, evaluation and recovery.

- **Mineral and Engineering Geology**
  Mechanical properties and behaviour of rocks; movement picture and movement plan; stress-strain relationships; symmetry concepts.

- **Design and stability of structures in rocks; geological problems in engineering design and construction; rock mechanics.
Igneous Petrology
Interpretation and representation of chemical analyses of minerals and rocks, microscopical analysis; petrology of selected igneous rock associations.

Metamorphic Petrology
Examination of the texture of metamorphic rocks; determination of processes involved in the production of grain shapes and deformation features within grains.

734100 GEOLOGY IV

Prerequisites
Geology IIIA, completion of ordinary degree requirements and permission of the Head of Department

Hours
To be advised

Examination
(i) performance in one 3-hour paper
(ii) a viva voce examination
(iii) research work carried out and its presentation in a thesis
(iv) such other work, e.g. seminars, assignments, earlier academic record, which may be considered relevant.

Content
Part A
Lecture-tutorial work with directed reading in two of the following fields of geology: mineralogy and crystallography, geochemistry; igneous petrology; metamorphic petrology; coal petrology; sedimentology; stratigraphy; palaeontology; structural geology; economic geology.

Not all fields will be available every year.

Part B
A research project, the results of which are to be embodied in a thesis.

Department of Physics

741200 PHYSICS IA

Prerequisite
Nil, however refer to Advisory Prerequisite for entry to the Faculty on p.15.

Hours
3 lecture hours and an average of 3 hours of laboratory and tutorial work per week.

Examination
One paper midyear, one paper at the end of year, together with laboratory and tutorial assessment.

Content
Physics IA is the principle prerequisite for students wishing to proceed to Physics II. Some students in the Faculty of Engineering may be required to take the subject Physics IA while others may have the option of attempting Physics IB. Engineering students should consult the Engineering Faculty Handbook.

A rigorous, mathematically based discipline with emphasis on the unifying principles which link together different areas of the subject. Lectures will cover mechanics, oscillations and waves, electrostatics, current electricity and electromagnetism, thermal physics, geometrical and physical optics, and quantum physics. The treatment throughout will assume some knowledge of calculus.

Texts
Refer to Physics Department Noticeboard.

741300 PHYSICS IB

Prerequisite
Nil, however refer to Advisory Prerequisite for entry to the Faculty on p.14.

Hours
3 lecture hours and 3 hours of laboratory and tutorial work per week.

Examination
One paper midyear, one paper at end of year, together with laboratory and tutorial assessment.

Content
For students who in general do not intend to proceed with further studies in Physics. The coverage of the subject will be somewhat broader than in Physics IA, but the treatment will involve a slightly lower level of mathematics.

Texts
Refer to Physics Department Noticeboard.

Weidner, R. T.
Physics (Allyn & Bacon 1985)

742200 ELECTRONICS & INSTRUMENTATION II

This subject will not be offered in 1987.

Prerequisites
Physics IA or IB

Hours
3 lecture hours, 4 laboratory hours and 2 tutorial hours with directed assignments each week.

Examination
One 2-hour paper on each of the 3 topics selected.
Content

Topic A — Basic Theory of Techniques;
Instrumentation Practice;
Specialist Instrumentation.

Topic B — Instrumentation Theory.

Topic C — Electrical Measurement Principles;
Digital and Linear Integrated Circuits;
Instrumentation Systems.

Topic D — Basic Device Physics;
Measurement Devices.

Students taking Physics II (either previously or concurrently) will be examined in Topics B, C and D. They must also attend the lectures on Instrumentation Practice in Topic A as part of the directed assignments requirements.

Students who have not taken Physics II will be examined in Topics A, C and D.

Text
Malmstadt, H. V. et al.

742100 PHYSICS II

Prerequisites
Physics IA and Mathematics I

Advisory Corequisite
While Mathematics II is not an essential corequisite for Physics II, Physics II students who have completed only Mathematics I should include a Mathematics II subject in their course. It is suggested that in addition to Topic CO this should include Topic B and one of the Topics D and F.

Hours
3 lecture hours and 6 laboratory hours per week.

Examination
Equivalent of 6 hours total examination.

Content
The areas of classical and quantum physics essential to the understanding of both advanced pure physics and the many applications of physics. Some electronics is also included.

Classical Physics
Mathematical methods, advanced mechanics, special theory of relativity, electromagnetics including waveguide and antenna theory.

Quantum Physics
Quantum mechanics, atomic and molecular physics, statistical physics, solid state physics, nuclear physics, electronics.

Laboratory
Parallels the lecture course in overall content, with at least one experiment available in each topic, although students are not expected to carry out all the experiments available.

Texts
Refer to the Physics Department notice board.

Students should retain their Physics II texts.

This subject will not be offered in 1987.

743100 PHYSICS IIIA

Prerequisites
Physics II, at least one Mathematics II subject which should include, in addition to topic CO (which counts as two topics), topic B and one of the topics D and F.

Texts
Refer to the Physics Department notice board.

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Department of Psychology

The attention of candidates for the degree of Bachelor of Science (Psychology) is drawn to the two notes following.

1. The Bachelor of Science degree with Honours in Psychology remains the preferred path for those who wish to complete a four-year Psychology course.
2. Students will not be permitted to transfer from Psychology IVP to Psychology IV, although the reverse may be permissible.

752100 PSYCHOLOGY IIA

Prerequisite
Psychology I

Corequisite
Psychology IIA

Hours
3 lecture hours, one 2-hour practical/tutorial session

Examination
Two 3-hour papers and an assessment of practical work. A 2-hour Experimental Methodology examination in July

Content
Will examine topics such as Animal Behaviour, Behavioural Neurosciences, Developmental Psychology, Experimental Methodology, Individual Differences, Information Processing, Learning and Conditioning, and Social Psychology.

Texts
To be advised

752200 PSYCHOLOGY IIIB

Prerequisite
Psychology I

Corequisite
Psychology IIA

Hours
3 lecture hours, one 2-hour practical session and 1 tutorial hour per week
Where formal examination is the method of assessment for individual topics, 1st Term topics will normally be held mid-year, and remaining topics will be examined in November.

Will examine topics which complement and/or are supplementary to Psychology IIA. Such topics may include Abnormal and Clinical Psychology, Computer applications in Human Information Processing, Developmental Psychobiology, Dreams and Fantasy, Drugs and Behaviour, Human Sexuality, Personality, Quantitative Methods, Self Awareness and Interpersonal Skills.

Examination

Examination

Where formal examination is the method of assessment for individual topics, 1st Term topics will normally be held mid-year, and remaining topics will be examined in November.

Content

Will examine topics which complement and/or are supplementary to Psychology IIA. Such topics may include Abnormal and Clinical Psychology, Computer applications in Human Information Processing, Developmental Psychobiology, Dreams and Fantasy, Drugs and Behaviour, Human Sexuality, Personality, Quantitative Methods, Self Awareness and Interpersonal Skills.

Texts

To be advised

753100 PSYCHOLOGY IIA

Prerequisite

Psychology IIA

Hours

4 lecture hours and up to 5 hours practical work per week

Examination

Formal examinations at (i) mid-year for 1st Semester topics and (ii) end of year for 2nd Semester topic. Assessment of practical work on a progressive basis.

Content

Will examine topics such as Behavioural and Clinical Neurosciences, Experimental Methodology and Quantitative Psychology, Information Processing and Perception, Learning and Conditioning, Social and Developmental Psychology and Individual Differences.

The practical work is divided into

(a) Laboratory sessions — 3 hours per week. The work will be divided into four sessions of approximately ½ Semester duration. In some weeks the time requirement will vary from that shown above.

(b) An investigation carried out under supervision and written up as a Research Report. The topic will usually be selected by the student from a list available from the Department in January. The time requirement is a minimum of 2 hours per week for the full year.

Texts

To be advised

753200 PSYCHOLOGY IIB

Prerequisite

Psychology IIB

Corequisite

Psychology IIA

Hours

4 lecture/seminar hours and approximately 5 hours practical work per week. Some material may be presented in seminars or workshops.

Examination

Examination of 1st Semester topics at mid-year and 2nd Semester topics at end of year. Material may be examined by formal examination or other forms of assessment.

Content

Will examine topics which complement and/or are supplementary to Psychology IIA. Such topics may include Abnormal and Clinical Psychology, Computer applications in Human Information Processing, Developmental Psychology and Psychobiology, Experimental Methods, Human Motivation, Neurosciences, Personality, Self Awareness and Interpersonal Skills, and Social Psychology. Practical work comprises workshop and laboratory work for up to 3 hours per week plus a supervised independent theoretical examination of an area of psychological investigation.

Students may have some choice in the topics presented. A list of topics will be available from the Department in January.

Texts

To be advised

754100 PSYCHOLOGY IV

Prerequisites

Completion of 9 subjects of a Bachelor's degree course within the Faculty of Science, normally including a pass at or above Credit level in Psychology IIA or IIB, as well as a Pass at any level in both Psychology IIA and IIB, or permission of the Head of Department.

Hours

To be advised

Examination

Assessment of thesis. Seminar material may be examined either by assignment during the year or by examination at the end of the year.

Content

The student is expected to cover such fields as abnormal and clinical psychology, behaviour, developmental psychology, learning and cognition, motivation, perception, personality, physiological psychology, quantitative psychology, and social psychology.

Texts

To be advised

754300 PSYCHOLOGY IVP

Prerequisites

9 subjects passed towards the degree of Bachelor of Science (Psychology), including Psychology IIA.

Hours

To be advised

Examination

Assessment of a project. Seminar material may be examined either by assignment during the year or by examination at the end of the year.

Content

The student is expected to cover such fields as abnormal and clinical psychology, animal behaviour, developmental psychology, learning and cognition, motivation, perception, personality, physiological psychology, quantitative psychology, and social psychology.

Texts

To be advised

664200 PSYCHOLOGY/MATHEMATICS IV

Prerequisites

Mathematics IIA & Psychology IIC
MASTER OF PSYCHOLOGY (EDUCATIONAL)

Prerequisites
A bachelor's degree including at least one Part III Psychology subject, a Diploma in Education or equivalent qualification and at least two years teaching or other relevant practical experience approved by the Board of Studies in Psychology.

Hours
18 formal hours and six practical hours per week in the first year. 10 formal hours and 24 practical hours per week in the second year.

Examination
Professional proficiency is evaluated through practical examinations and ongoing assessments. There is a formal examination at the end of the first year and an assessment of professional competence and progress of the thesis at the end of the second year.

Content
First Year
Seminars on psychological development of the child, the child in school and society, cognitive development, exceptional and problem children, counselling theory and procedures, education systems and personal development.

Second Year
The course work consists of seminars and workshops which extend the work from the first year in counselling theory and procedures, case work, consulting and communication skills. Work continues on the thesis begun in the previous year.

Department of Geography

351100 GEOGRAPHY I

Prerequisites
Nil

Hours
2 lectures and 2 hours of practical work per week. A two-day excursion.

Examination
Progressive assessment and one three-hour paper in November.

Content
The first year provides an introduction to Geography. It consists of lectures in human and physical geography and an practical course in geographical methods. These themes are continued in later years.

Human geography
Introduction to human geography; including cultural, population, economic, development and urban geography. One hour per week.

Physical geography
Introduction to physical geography; including meteorology and climate; the influence of geomorphic processes on landforms: weathering, rivers, ice, frost, wind and the sea. The physical, chemical and biological characteristics of soil, and the development of soil profiles. Environmental and historical factors that influence plant distribution. One hour per week.
Geographical methods. An introduction to a range of geographical methods used to study climate, topographic maps, aerial photographs, soils and vegetation and an introduction to elementary statistical data and its presentation by thematic maps. Two hours per week.

**Texts**

Haggett, P. *Geography: a modern synthesis* (Harper & Row, latest paperback edn)  

**352100 GEOGRAPHY IIIA: HUMAN GEOGRAPHY**

**Prerequisite** Geography I   
**Hours** Five hours of lectures/practical/tutorials and one hour of Geographical Methods* per week; up to six days of fieldwork.  
(*Note: Students also enrolled in Geography IIIB must undertake both Geographical Methods and Contemporary Australian Environments*)

**Examination** To be advised

**Content**  
A study of human activities within the context of space and time; in 1987 themes will be established around the following specific fields of interest:  

- **Behavioural and ecological approaches** (Assoc. Prof. D. N. Parkes) The study of territoriality, spatial interaction, and movement; environmental perception and the sense of place; the principal elements of human activity structure and analysis.  
- **Development geography** (Dr W. Jonas) Principles, issues in world development; measures and models; dualism; modernisation; trickle-down hypothesis; regional development; colonialism; capitalism; imperialism; the development of underdevelopment.  
- **East Asia** (Dr R. E. Barnard) Selected aspects of the geography of China and Japan, including population, agriculture and manufacturing; contrasting patterns emerging from development in the two countries; sub-national studies to illustrate differences in national development within the two countries.  
- **Economic geography** (Ms M. R. Hall) Key questions in economic geography; trends in the location of economic activity; for example, in food availability and deficit patterns; in the location of coal mining; international development strategies.

**Texts**


**352200 GEOGRAPHY IIIB: PHYSICAL GEOGRAPHY**

**Prerequisite** Geography I

**Hours** Five hours of lectures/practical/tutorials and one hour of Geographical Methods* per week; up to six days of fieldwork.  
(*Note: Students also enrolled in Geography IIIB must undertake both Geographical Methods and Contemporary Australian Environments in IIIB only*)

**Examination** To be advised

**Content**  
A continuation of the study of human activities within the context of space and time which were developed in Geography IIIA. In 1987 themes will be established around the following specific fields of interest:  

- **Climatology** (Dr H. A. Bridgman, Dr G. N. McIntyre) An introduction to the study on a synoptic and meso-climatic scale including radiation and heat budgets; thermodynamics; precipitation processes; climates of the world; climatic change; agricultural climatology; applied climatology.  
- **Geomorphology** (Prof. E. A. Colhoun, Dr R. J. Loughean) Rocks and their weathering, structural landforms, soils, slope development and mass movements, fluvial, aeolian and coastal processes and landforms.  
- **Contemporary Australian environments** The physical and human background; rural Australia; industrial and urban Australia, changing Australian society.

**Texts**


- **Strands common to Geography IIIA and IIIB.**

**353100 GEOGRAPHY IIIA: HUMAN GEOGRAPHY**

**Prerequisite** Geography II

**Hours** Five hours of lectures/practicals/tutorials, and one hour of Geographical Methods* per week; up to six days of fieldwork.  
(*Note: Students also enrolled in Geography IIIB must undertake both Geographical Methods and Problems and Issues in the Australian Environment.*)

**Examination** To be advised

**Content**  
A continuation of the study of human activities within the context of space and time which were developed in Geography IIIA. In 1987 themes will be established around the following specific fields of interest:  

- **A geography of Australia: an historical perspective** (Mr. K. W. Lee) Selected aspects of the population, settlement and land use patterns of Australia from 1788.  
- **Human ecological approaches** (Assoc. Prof. D. N. Parkes) The study of three ecological approaches: the classical/neo-classical, the chronogeographic/time geographic, and the eco-behavioural.  
- **Explanation in geography** (Ms M. R. Hall) The study emphasizes the use of primary sources; (i) knowing the world, the relevant tools for interpretation; (ii) the known world, studies of the development of western geography through the study of cartography and texts from the mid-19th century and the period since 1965; (iii) professional literacy in the 1980s.
Southeast Asia (Dr R. E. Barnard) The geography of development in Southeast Asia, particularly Malaysia and Indonesia; changes in agriculture, manufacturing, marketing and distribution, and their social and economic impact.

Texts

353200 GEOGRAPHY IIIB: PHYSICAL GEOGRAPHY

Prerequisite
Geography IIB

Hours
Five hours of lectures/practicals/tutorials, and one hour of Geographical Methods* per week; up to eight days of fieldwork.
(*Note: Students also enrolled in Geography IIIA must undertake both Geographical Methods and Problems and Issues in the Australian Environment.)

Examination
To be advised

Content
A continuation of the study of the physical environment. In 1987 themes will be established around the following specific fields of interest.

Advanced Climatology (Dr H. A. Bridgman, Dr G. N. McIntyre) The application of principles studied in Geography IIB to (i) processes in agricultural climatology; and (ii) meso- and macro-scale pollution problems and their relationship to climatic change.

Explanation in geography (Me M. R. Hall) The study emphasizes the use of primary sources; (i) knowing the world, the relevant tools for interpretation; (ii) the known world, studies of the development of western geography through the study of cartography and texts from the mid-19th century and the period since 1965; (iii) professional literacy in the 1980s.

Cold climate landforms and Quaternary geography of the southern hemisphere (Prof. E. A. Colhoun) Glacial and periglacial processes and landforms, field excursion, dating methods in geomorphology and southern hemisphere Quaternary landscapes.

Soil erosion and conservation (Dr R. J. Loughran) Processes of soil erosion, sediment transport and deposition in the context of the drainage basin; soil conservation issues and methods.

Texts
* Strands common to Geography IIIA and IIIB.

354100 GEOGRAPHY IV

Prerequisites
In order to qualify for admission to Geography IV, a student must normally have completed a sequence of Geography I, II and III subjects; two of these, including the Part III subject, should normally have been passed at Credit level or better. The student must also satisfy the Head of the Department of his/her ability in the area of study within which the proposed research topic lies.

Hours
As prescribed by the Head of the Department

Examination
To be advised

Content
A thesis embodying the results of an original investigation on a topic approved by the Head of the Department and coursework as prescribed.

Texts
To be advised

Note: A candidate who wishes to proceed to Honours should notify the Head of Department by the commencement of Third Term of the previous year, and must confirm this as soon as final results for the year are known. Candidates are expected to commence work on their theses early in the new year.

Department of Mathematics, Statistics & Computer Science

Note: As from 1 January, 1987 this Department will be replaced by the three separate Departments of Computer Science, of Mathematics and of Statistics. Students should consult the relevant Department for advice regarding subjects.

Preliminary Notes
The Departments offer and examine subjects, most being composed of topics, each single-unit topic consisting of about 27 lectures and 13 tutorials. Each of the Part I, Part II, and Part III subjects consists of the equivalent of four single unit topics. For Mathematics I, Computer Science I and Computer Science II there is no choice of topics; for Mathematics IIIA, IIIB, IIC and Statistics III there is some choice available to students; for Mathematics IIIA and IIIB and Computer Science III there is a wider choice. Statistics III is a specified course, requiring previous topic selection in Mathematics II. No topic may be counted twice in making up distinct subjects.

In 1987 Computer Science II and in 1988 Computer Science III will be revised to take account of the introduction of Computer Science I in 1986. Students should take particular note of Regulation 9(3)(b) of the regulations for the ordinary degree of Bachelor of Science.

Progressive Assessment
From time to time during the year students will be given assignments, tests, etc. Where a student’s performance during the year has been better than that student’s performance in the final examination, then the year’s work will be taken into account in determining that student’s final result. On the other hand, when a student’s performance during the year has been worse than that student’s performance in the final examination, then the year’s work will be ignored in determining the final result.

PART I SUBJECTS
The Departments offer two Part I subjects, Mathematics I and Computer Science I.

661100 MATHEMATICS I

Prerequisites
Nil

Hours
4 lecture hours and 2 tutorial hours per week

Examination
Two 3-hour papers
Content

The following four topics:

**PART I TOPICS**

**Algebra**


*Text*

Anton, H.

*References*

Brisley, W.  
Kolman, B.  
Liebeck, H.  
Lipschutz, S.

**Real Analysis**


*Text*

Nil

*References*

Apostol, T.  
Giles, J. R.  
Spivak, M.  
Stein, S. K.

**Calculus**


*Text*

Nil

*References*

Ayres, F.  
Edward, C. H. & Penny, D. E.  
Stein, S. K.

**Statistics and Computing**

An introduction to elementary numerical analysis, computing and statistics. Topics include finding roots, estimating integrals, handling and presenting data. Programming in Pascal starts early in the course, and students are required to compose and use effective programs and carry out laboratory work.

*Text*

University of Newcastle

*References for Pascal*

Cooper, D. & Clancy, M.  
Savitch, Walter J.

*Other References*

Conic, S. D. & de Boor, C.  
Huntberger, D. V. & Billingsley, P.

681100 COMPUTER SCIENCE I

*Corequisite*  
Mathematics I

*Hours*  
3 lecture hours and 3 laboratory hours per week.

*Examination*  
Two 2-hour papers and one mid-year paper.

**Statistics and Computing**

An introduction to elementary numerical analysis, computing and statistics. Topics include finding roots, estimating integrals, handling and presenting data. Programming in Pascal starts early in the course, and students are required to compose and use effective programs and carry out laboratory work.

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University of Newcastle

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681100 COMPUTER SCIENCE I

*Corequisite*  
Mathematics I

*Hours*  
3 lecture hours and 3 laboratory hours per week.

*Examination*  
Two 2-hour papers and one mid-year paper.
PART II SUBJECTS

The Departments offer three Part II Mathematics subjects, Statistics II and Computer Science II. Students whose course restricts them to one such subject must study Mathematics IIA, Mathematics IIB, Statistics II or Computer Science II. The subject Mathematics IIA is a pre- or corequisite for Mathematics IIC, and IIA and IIC together a prerequisite for Mathematics IIB, so students wishing to take two Part II subjects should consult the Faculty of Mathematics Handbook.

When selecting topics for Part II subjects, students are advised to consider the prerequisites needed for the various Part III subjects offered by the Departments. Summaries and extended booklists for these topics will appear in the handbook of the Faculty of Mathematics and will also be available from the Department.

List of Mathematics Part II Topics

<table>
<thead>
<tr>
<th>Topic</th>
<th>Corequisite or Prerequisite Topic</th>
<th>Part III Topic Requiring this Part II Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Mathematical Models</td>
<td>CO</td>
</tr>
<tr>
<td>B</td>
<td>Complex Analysis</td>
<td>CO</td>
</tr>
<tr>
<td>CO</td>
<td>Vector Calculus &amp; Differential Equations (Double topic)</td>
<td>M, N, P, Q, QS, TC, W, Z</td>
</tr>
<tr>
<td>D</td>
<td>Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Topic in Applied Mathematics</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Numerical Analysis &amp; Computing</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Discrete Mathematics</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Topic in Pure Mathematics</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Analysis of Metric Spaces</td>
<td></td>
</tr>
</tbody>
</table>

Summaries and extended booklists for these topics will appear in the handbook of the Faculty of Mathematics and will also be available from the Department.

662100 MATHEMATICS IIA

Prerequisite: Mathematics I
Hours: 4 lecture hours and 2 tutorial hours per week
Examination: Each topic is examined separately
Content: Topics B, CO and D. In exceptional circumstances and with the consent of the Head of Department, some substitution of topics may be allowed.

662200 MATHEMATICS IIB

Prerequisite: Mathematics I
Hours: 4 lecture hours and 2 tutorial hours per week
Examination: Each topic is examined separately
Content: Four topics chosen from A to G, where CO counts as two topics, and approved by the Head of Department. In exceptional circumstances, and with the consent of the relevant Heads of the Departments one or more of the topics from Statistics II (offered by the Department of Statistics), K or L may be included.

662300 MATHEMATICS IIC

Prerequisite: Mathematics IIA
Pre- or Corequisite: Mathematics IIB
Hours: 4 lecture hours and 2 tutorial hours per week
Examination: Each topic is examined separately
Content: Topics K and L plus two topics chosen from A to G, or Probability and Statistics (the double topic offered by the Department of Statistics), or one topic chosen from A to G together with Random Processes and Simulation (offered by the Department of Statistics). Under exceptional circumstances and with the consent of the Heads of the Departments concerned, some substitution may be allowed.

682100 COMPUTER SCIENCE II

Prerequisite: Computer Science I
Hours: 4 lecture hours and approx. 4 hours of tutorials and practical work per week
Examination: By topic
Content: This subject comprises the four topics:
- Introduction to Assembly Language & Operating Systems
- Comparative Programming Languages
- Data Structures and Algorithms
- Commercial Programming

682900 COMPUTER SCIENCE IIT — TRANSITION

Prerequisite: Mathematics I
Hours: 4 lecture hours and approx. 4 hours of tutorial and practical work per week
Examination: By topic
Transitional Arrangements. Students who enrolled in a B.Science degree before 1986 and who have not taken Computer Science I may, as a transitional arrangement, enrol in Computer Science III. For these students, the topic Introduction to Programming must be substituted for Commercial Programming.

692100 STATISTICS II

Prerequisite Mathematics I

Hours 4 lecture hours and approx. 4 hours of tutorials and practical work per week.

Examinations By topic

Content
This subject consists of the following topics:
PS: Probability & Statistics
AS: Applied Statistics
RP: Random Processes and Simulation

Topic PS: Probability and Statistics is a double topic which runs throughout the year while AS: Applied Statistics is in Semester 1 only and RP: Random Processes and Simulation is in Semester 2 only.

PART III SUBJECTS

In the Faculty of Science this Department offers Mathematics IIIA comprising four topics chosen from the list below, and the subject Statistics III. See also the separate entry in this Handbook for SMIII (page 37).

Passes in both Mathematics IIIA and IIC are prerequisite for entry to Mathematics III. It will be assumed that students taking a Part III subject have already studied topics CO, D, K and L (or C, D, E, K and L if done prior to 1978) in their Part II subjects. Students wishing to enrol in Statistics III should consult the Head of the Department of Statistics.

Summaries of the Part III topics together with extended booklists will appear in the handbook of the Faculty of Mathematics and will also be available from the Department.

List of Topics for Part III Mathematics

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
<th>Specific Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>General Tensors and Relativity</td>
<td>CO</td>
</tr>
<tr>
<td>N</td>
<td>Variational Methods and Integral Equations</td>
<td>CO</td>
</tr>
<tr>
<td>O</td>
<td>Mathematical Logic and Set Theory</td>
<td>CO, D</td>
</tr>
<tr>
<td>P</td>
<td>Ordinary Differential Equations</td>
<td>CO, D</td>
</tr>
<tr>
<td>PD</td>
<td>Partial Differential Equations</td>
<td>CO</td>
</tr>
<tr>
<td>Q</td>
<td>Fluid Mechanics</td>
<td>B, CO</td>
</tr>
<tr>
<td>QS</td>
<td>Quantum, and Statistical Mechanics</td>
<td>CO</td>
</tr>
<tr>
<td>S</td>
<td>Geometry</td>
<td>CO</td>
</tr>
<tr>
<td>T</td>
<td>Group Theory</td>
<td>D, K</td>
</tr>
<tr>
<td>TC</td>
<td>Theory of Computing</td>
<td>CO</td>
</tr>
<tr>
<td>V</td>
<td>Measure Theory and Integration</td>
<td>L</td>
</tr>
<tr>
<td>W</td>
<td>Functional Analysis</td>
<td>B, CO, D, K, L</td>
</tr>
<tr>
<td>X</td>
<td>Fields and Equations</td>
<td>D, K</td>
</tr>
<tr>
<td>Z</td>
<td>Mathematical Principles of Numerical Analysis</td>
<td>CO, D</td>
</tr>
</tbody>
</table>

Some topics will be offered only in alternate years, and in particular, some may be available as Mathematics IV topics.

The selection rules of the Part III subjects follow:

68
Topics
1. Computer Operating Systems (EE463)
2. Programming Languages and Systems (PL)
3. Compiler Design (CD)
4. Mathematical Logic and Set Theory (O)
5. Theory of Computing (TC)
6. Switching Theory and Logical Design (EE362)
7. Mathematical Principles of Numerical Analysis (Z)
8. Commercial Programming (CP)
9. Systems Analysis (Diploma Course)
10. Systems Design (Diploma Course)

Summaries of these topics, together with extended book lists will appear in the Handbook of the Faculty of Mathematics and will also be available from the Department.

(i) The bracketed notation indicates corresponding courses and topics, to avoid double-counting.

(ii) Students who are considering eventual careers as Computer Systems Officers in the Commonwealth Public Service are strongly advised to compose a selection which includes the topic ‘Systems Design’.

RESEARCH IN THE FACULTY OF SCIENCE

Department of Biological Sciences

The research interests of members of the Department are as follows.

Reproductive Biology of Male Vertebrates (Associate Professor R. C. Jones)
Studies on the ultrastructure, function and regulation of the reproductive tract, particularly the epididymis. The functional studies are examining the relationship between protein secretion and electrolyte transport in the epididymis to sperm maturation. Also, studies on the regulation of intracellular electrolytes in sperm during maturation and processing for deep-frozen storage.

Mammalian Female Reproductive Biochemistry (Dr R. N. Murdoch)
Studies of uterine biochemistry during blastocyst implantation and elucidation of the nature of embryonic stimuli responsible for the establishment of pregnancy. Also, studies of mechanisms by which alcohol abuse leads to birth defects.

Ecological Genetics (Dr B. A. Conroy)
The ecology and genetics of populations of Lepidoptera; the population dynamics of the cup moth Donatiatrix oxleyi at Blackbutt; geographical and seasonal variation in butterflies.

Chloroplast DNA and Plant Cell Culture (Dr R. J. Rose)

Carbon Partitioning in Plants (Dr J. W. Patricek)
Hormonal regulation of phloem translocation. Mechanisms and control of phloem unloading in stems and developing seeds. Investigations focus on both symplastic and apoplastic transfer. Sugar transport across the plasma membranes of transfer cells.

Recombinant DNA Technology
(Professor B. Bootcher)
Recombinant DNA technology is currently being applied to several areas of study: the expression of oncogenes in cancer, particularly in melanoma and gastric carcinoma; the role of Z-DNA in chromatin and DNA coiling and uncoiling; individual DNA fingerprints in pedigree and forensic studies.

Early Development and Its Control in Marsupials (Dr C. Rodger)
Three areas are under study: (1) Fertilization and events in the female leading up to this cell interaction; (2) the initial stages of embryonic development and the differentiation of distinct cell lineages; and (3) the marsupial placenta as a model system to study the evolution of the invasive trophoblast.

Pathway of Carbon Transport in Plants
(Prof C. E. Offer)
Cellular pathway of phloem unloading of sugars in stems and developing seeds. Anatomical and ultrastructural investigations directed towards quantifying cellular features involved in apoplastic and symplastic transport including studies on transfer cells.

Immunology of Reproduction (Associate Professor T. K. Roberts)
The interrelationships of the immune system and the reproductive system are being studied in man and other mammals. Specific projects include the immunosuppressive nature of seminal plasma; the immunological consequences of mating; the mechanism of immunoregulation in pregnancy to ensure placental survival; and the immunology of very early pregnancy. These projects interdigitate with studies on infertility, pregnancy detection and in vitro fertilization, as well as with the practice of monoclonal antibody formation.
Department of Chemistry

The research interests of members of the Department are as follows.

Aliphatic, Aromatic and Heterocyclic Chemistry (Associate Professor L. A. Summers)
Synthesis, with particular reference to the preparation of biologically active compounds; mass spectral fragmentation of organic molecules; electron transfer agents for the solar conversion of water to hydrogen.

Analytical and Environmental Chemistry (Professor W. F. J. Pickering)
Evaluation of trace analysis techniques; investigation of factors influencing the sorption (or release) of heavy metal ions or toxic anions by soil/sediment components; development of speciation procedures.

Analytical Chemistry: Wine Science (Dr G. L. Orr)
Innovative methods of chemical analysis; application to oenology.

Electrochemistry (Dr R. A. Fredlein)
Mechanisms of electrode reactions; semiconductor electrochemistry; double-layer structure and electrosorption at solid electrodes; electrochemistry of oxide bronzes.

Inorganic and Organometallic Chemistry (Dr R. C. Burns)
Synthesis of cage and cluster species of the transition metals and immediate post transition elements. Organometallic clusters. Bonding and structure of transition metal and main group clusters. NMR studies of heteropolyatomic cations and anions.

Organic Reaction Mechanism (Associate Professor L. K. Dyall)
Studies on the mechanism of oxidations which involve a neighbouring group in a cyclization process; reactions of nitrenes.

Organic Synthesis and Stereochemistry (Dr K. H. Bell)
Development of new synthetic reactions; synthesis of potential analgetics; organosulfur chemistry; stereoselective reactions; natural product synthesis.

Radiochemistry (E. B. Jacobs)
Applications of tracers in studies of equilibria in solvent extractions and kinetics of transport of inorganic ions in plants and plant tissue.

Theoretical Chemistry (Dr E. von Nagy-Felsobuki)
Modelling of infrared spectra of triatomic molecules that are of astronomical interest. Theoretical description of infrared, Raman and photoelectron spectra of bipyridyl and related molecules.

Transition Metal Chemistry (Dr G. A. Lawrance)
Kinetics and mechanisms of reactions of co-ordination and organometallic compounds; synthetic and biomimetic chemistry of co-ordination complexes; particularly with macrocyclic ligands; electrochemistry of metal amine complexes.

Department of Geology

Carboniferous Stratigraphy / Palaeontology (Associate Professor B. A. Engel)
Carboniferous palaeogeographic and tectonic evolution of the Tasman Mobile Zone. Evolutionary and ecological variation in Carboniferous marine invertebrate zones of Eastern Australia. Studies of Carboniferous trilobites, fenestrate bryozoa and brachiopods.

Coalfield Geology (Associate Professor C. F. K. Diesel)
Coal formation and sedimentology of associated clastic sediments. Coal petrology, reflectance of coalified and graphitized dispersed organic matter in sediments and its application to metamorphic grade and petroleum exploration. Petrographic studies of the reactivity of so-called inert macerals during carbonization.

Coal and Oil Shale Mineralogy (Associate Professor S. J. T. Warne)
Investigations into the development and application of advanced mineralogical techniques to mineral mixtures in and associated with coal and oil shales and their technological implications.

Economic Geology (Dr P. K. Scroombes)


Engineering Geology (Associate Professor K. H. R. Moelle)
Application of geology to engineering problems, directional mining and foundation stability.

Geology of the Hunter Valley (All staff)
Detailed geology, including stratigraphy, structural geology, palaeontology, sedimentology, palaeoecology and palaeoclimatology.

Igneous Petrology (Dr D. R. Mason)
Petrology of basaltic rocks of Barrington Volcanic Field, NSW; petrology of bi-modal volcanic suite, Lachlan Fold Belt, NSW; mineral chemistry of Permian granitoids, Barrington Tops, NSW; petrology of syn-plutonic dykes and mafic inclusions, California, USA.

Metamorphic Petrology (Dr R. Offer)
Mineralogy and geochemistry of low-grade metamorphic rocks, north of Newcastle, and Central Peru, South America; the structure and metamorphism of rocks south-east of Mudgee, New South Wales; and wall rock alteration patterns around base metal deposits.

Mineralogy (Associate Professor S. J. T. Warne)
Detailed studies of mineral species, groups, mixtures and isomorphous substitution series with emphasis on applications of thermal analysis and infrared techniques to their composition and decomposition products.

Structural Geology (Associate Professor K. H. R. Moelle)
Assessment of brittle deformation features and their interpretation in a regional setting; aspects of faulting in the northern fringe area of the Sydney Basin, New South Wales.
Geophysics — Geomagnetic Pulsations (Associate Professor R. J. MacDonald, Dr D. J. O'Connor, Dr B. V. King)

When an energetic ion beam interacts with a solid surface, a complex collisional situation develops which includes elastic and inelastic scattering events. The research of the ion-surface interaction group involves studies of the interaction and the collisional and atomic processes leading to scattering, sputtering, ionisation and excitation of the particles involved in the event. The application of ion-surface interaction to the atomic or the structural and composition of surfaces is an important part of the work of the group. Finally work is beginning on the way in which the properties of a surface may be modified by ion implantation.

Surface Physics - Ion-surface Interaction (Professor R. J. MacDonald, Dr D. J. O'Connor, Dr B. V. King)

The use of electron beams in surface studies is concerned principally with Low Energy Electron Diffraction (LEED) and Auger Electron Spectroscopy (AES). The use of these techniques is directed towards the study of the structure and composition of clean metal surfaces and the adsorption of other species thereon. In particular, one area of special interest is the initial stages of oxidation, specifically the interaction of oxygen with aluminium. A fast scanning TV system adapted for the quantitative LEED study of adsorption is being developed. A low spatial resolution (~5μm) Auger Electron Microprobe system for the study of surfaces and their modification is also being developed.

Geophysics — Radar Meteor Studies (Associate Professor C. S. L. Keay)
A fully automated radar meteor system at a field station north of Newcastle has been established. A new HF pulse transmitter has been installed, and data is being communicated to the Department on campus by a radar relay link. Digital Techniques employing micro-computers and micro-computers have been developed to allow signal processing to be carried out in real time.

Surface Physics — Electron-surface Interaction (Associate Professor J. A. Ramsay, Mr R. H. Roberts, and Mr J. E. Cleary)

Studies in ultra low frequency plasma waves (geomagnetic pulsations) in the earth's magnetic field environment, the magnetosphere, are being undertaken experimentally using a network of geomagnetic recording stations situated across Australia and in the Antarctic. Of particular interest are ion cyclotron wave generation and propagation mechanisms in the magnetosphere and the ionosphere and the origin of standing wave resonant field line oscillations at low latitudes. Spacecraft studies are also carried out in co-operation with experimenters in the U.S.A. Sophisticated digital time series analysis techniques and micro computer-based recording and analysing systems are employed.

Geophysics — Geomagnetic Pulsations (Associate Professor B. J. Fraser, Dr F. W. Menk)

Investigations in theoretical solid state physics involve the application of semi-empirical techniques incorporating total-energy algorithms to the determination of the surface geometries of both metals and covalent solids. The role of dilute substitutional and interstitial impurities in simple and transition metal hosts is also being studied with particular reference to hydrogen.

Theoretical Solid State Physics (Associate Professor P. V. Smith)

Investigations in theoretical solid state physics involve the application of semi-empirical techniques incorporating total-energy algorithms to the determination of the surface geometries of both metals and covalent solids. The role of dilute substitutional and interstitial impurities in simple and transition metal hosts is also being studied with particular reference to hydrogen.

Electromagnetic Wave Propagation and Instrumentation (Dr P. A. McGovern)

A study of electromagnetic wave propagation in non-uniform structures and transverse electromagnetic (TEM) cells using time-domain measurement techniques. This programme includes development of analog IC techniques to enable the simulation of solutions to some microwave instrumentation problems.

Department of Psychology

The research activities of the department may be grouped under different broad headings reflecting the special interests of the staff members. However, there is sufficient overlap among the groups to maintain communication at a high level.

Animal Learning

Research is being conducted to examine the stimulus control of behaviour with particular attention being paid to phenomena such as conditioned inhibition, blocking and overshadowing.

Applied Human Information Processing

Computer-controlled techniques are being developed to detect fatigue in machine operators and to minimize the risk of repetitive strain injury in keyboard operators.

Biofeedback and Self-Regulation

The emphasis in this area is in the voluntary control of autonomic processes including heart rate, blood pressure and skin temperature. Research is aimed at clinical health problems including cancer, and other immune deficiency diseases, as well as other problems usually described as psychosomatic.

Cognitive Processes

Research into the development of cognitive processes has continued with particular emphasis on factors associated with the acquisition of concepts. Several theoretical formulations are being explored as part of this research.

Cross-Cultural Research

Current research includes work on cognitive processes, the role of language in concept development, the cultural bases of concepts of intelligence and the development of values. Cultural groups studied are from Malaysia, the People's Republic of China and migrant groups in the Newcastle area.

Developmental Psychology

The efficacy of various types of experiences throughout the lifespan on patterns of human development and change.

Infant Perception

Research is currently examining various perceptual and attunement abilities in infants. The studies incorporate autonomic system measures as well as the more usual behavioural measures.
Mathematical Psychology
In mathematical psychology, experimental studies of new methods of measuring abilities and personality are continuing. Stochastic models for reaction time and models for the formation of associative memory are being developed. These models are being applied to the computer-based assessment of individual differences. Psychological applications of adaptive filtering and system identification are being devised.

Neuropsychology
Cerebral laterisation of response is the focus of interest. Studies in progress include the electrophysiology of post-concussive states, validation of neuropsychological tests, event-related potentials in linguistic and other complex stimulation schedules, evoked potential indices of stereopsis using random-dot patterns in stroke patients and other clinical groups, and apparent motion.

Perception
The perception laboratory currently conducts research in motion and apparent motion perception and information processing techniques. Studies of driver behaviour and ergonomic aspects of repetitive strain injury are being pursued.

Personality Motivation and Values in Relation to Work
A programme of laboratory and field studies of the effects of various personal factors on work behaviour in the Newcastle area is beginning, being a continuation of previous cross-cultural work in Africa.

Social Development
A programme of research is being carried out on developmental aspects of children’s friendship patterns. In the programme the development of social skills, the social learning of isolated children and small group interaction are being studied.

Transpersonal Psychology
The investigation of conscious experience including the study of meditation, fantasy and daydreams, and dreams.

Department of Geography

Biogeography
Vegetation of the Hunter Valley with particular reference to rainforest ecology (J. C. Turner)
Quaternary palynology and vegetation history of western Tasmania (E. A. Colhoun)

Climate
Agricultural climatology with special reference to viticulture (G. N. McIntyre)
Air pollution on a meso and micro scale; solar radiation; climatic change (H. A. Bridgman)
Quaternary palaeoclimates of Tasmania (E. A. Colhoun).

Development geography
Marketing of agricultural produce in Bandung Regency, West Java; demographic changes in a Malay village, Kedah, Malaysia (R. E. Barnard)
Development issues in Sri Lanka; basic needs of NSW Aborigines (M. R. Hall).
Aboriginal housing and problems and issues in inner-city land use; basic needs of Aborigines (W. J. A. Jonas).

Environmental science
Development of a complete environmental monitoring programme for proposed open-cut and underground coal mines, including meteorological, air and water quality monitoring; development of a computerized management system for vineyards in the Hunter Valley (J. B. Symon).

Geographical theory and philosophy
Explanation in geography (M. R. Hall)
Time-space and socio-technical systems, agricultural geography (K. W. Lee)
Development of theory and applications in chronogeography and behaviour ecology (D. N. Parkes)

Geomorphology
Hillslope erosion and sedimentation using the environmental tracer caesium-137 (R. J. Loughran)
Glacial and periglacial geomorphology of Tasmania and Bunger Hills, Antarctica; sea level changes in southeastern Australia and Antarctica (E. A. Colhoun).

Historical geography (J. C. R. Camm)
Australia 1788-1988 Bicentennial History Project - historical geography atlas of Australia; the historical geography of the Great Depression, Australia 1925-1939; the historical geography of migration, Australia 1830-1930.

Settlement (D. N. Parkes)
Human activity structures in remote and especially arid and tropical settlements in Australia.
Department of Mathematics, Statistics & Computer Science

Algebra
Professor A. J. Dobson and Associate Professor R. W. Gibberd collaborate with the Faculty of Medicine to investigate various problems in epidemiology. Current research includes: regional variations in mortality and morbidity; trends in ischemic heart disease incidence, cause-specific mortality rates, risk factors and medical treatment; use of hospital separation data for epidemiological research; hospital planning models; doctor patient interactions; use of antibiotics; evaluation of intervention programmes.

Number Theory
Dr R. B. Eggleton is interested in number theory, particularly in combinatorial aspects of the subject such as distribution of prime factors in runs of consecutive integers, and partitions of a number into summands which are divisors of that number.

Biostatistics
Dr W. Summerfield is interested in all problems of extrapolating regular perturbation series in fluid mechanics.

Biophysics
Professor J. L. Keedy is leader of the MONADS research project, which involves a team currently working at Monash University and at the Technical University of Darmstadt in West Germany as well as in Newcastle. The aim is to establish improved methods for specifying, designing and implementing major software systems. This involves work in a variety of computer science areas, including software engineering, computer architecture and hardware, systems programming, language design, compiler design, databases, computer networking, etc. Substantial practical work is also done for both honours and postgraduate projects in computer science.

Dynamical Systems
Dr J. G. Couper is working on stable and generic properties of flows and diffeomorphisms.

Differential Geometry and Relativity
Associate Professor P. K. Smrz is working on generalizations of Einstein's theory of relativity using modern differential geometry — in particular, the theory of Lie groups and fibre bundles.

Epidemiology
Professor A. J. Dobson and Associate Professor R. W. Gibberd collaborate with the Faculty of Medicine to investigate various problems in epidemiology. Current research includes: regional variations in mortality and morbidity; trends in ischemic heart disease incidence, cause-specific mortality rates, risk factors and medical treatment; use of hospital separation data for epidemiological research; hospital planning models; doctor patient interactions; use of antibiotics; evaluation of intervention programmes.

Fluid Mechanics
Professor A. J. Guttmann is studying the problem of extrapolating regular perturbation series in fluid mechanics.

Functional Analysis
Associate Professor J. R. Giles is carrying out research in the geometry of Banach spaces. In particular, he is interested in the differentiability theory for the norm and convex functions. He is working on the development of the theory of differentiation of locally Lipschitz functions with a view to applying it to several geometrical problems in Banach spaces.

Geometry
Professor A. J. Guttmann is using

Mathematical Biology
Dr D. L. S. McElwain is developing mathematical models of biological systems including tumour transport epithelia and facilitated transport of oxygen in tissue.

Biostatistics
Dr W. Summerfield is interested in all problems of extrapolating regular perturbation series in fluid mechanics.

Biophysics
Professor J. L. Keedy is leader of the MONADS research project, which involves a team currently working at Monash University and at the Technical University of Darmstadt in West Germany as well as in Newcastle. The aim is to establish improved methods for specifying, designing and implementing major software systems. This involves work in a variety of computer science areas, including software engineering, computer architecture and hardware, systems programming, language design, compiler design, databases, computer networking, etc. Substantial practical work is also done for both honours and postgraduate projects in computer science.
### SUBJECT COMPUTER NUMBERS FOR THE BACHELOR DEGREE COURSES

The subjects selected should be written on the enrolment form in the following manner.

<table>
<thead>
<tr>
<th>Computer Number</th>
<th>SUBJECT NAME</th>
<th>NAMES OF COMPONENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>711100</td>
<td>Biology I</td>
<td></td>
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<tr>
<td>72100</td>
<td>Chemistry I</td>
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<tr>
<td>681100</td>
<td>Computer Science I</td>
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<td>351100</td>
<td>Geography I</td>
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<td>731100</td>
<td>Geology I</td>
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<td>661100</td>
<td>Mathematics I</td>
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<td>Physics IA</td>
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<td>751100</td>
<td>Psychology I</td>
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**Computer Number**

<table>
<thead>
<tr>
<th>Computer Number</th>
<th>SUBJECT NAME</th>
<th>NAMES OF COMPONENTS</th>
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</thead>
<tbody>
<tr>
<td>712100</td>
<td>Biology IIA</td>
<td>Biological Methods</td>
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(Four for each subject — see text for details)

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**Footnote:** A student wishing to do this subject should consult the Dean of the Faculty of Science.
### Mathematics IIA

- **663100** Mathematics IIA

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- **663500** SM III

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### Other Disciplines

- **743100** Physics IIA
  - 743200 Physics IIB
- **714100** Biology IV
- **724100** Chemistry IV
- **734100** Geography IV
- **734100** Geology IV
- **664100** Mathematics IV
- **744100** Physics IV
- **754100** Psychology IV
- **754300** Psychology IVP
- **664500** Geology/Mathematics IV
- **664200** Physics/Mathematics IV
- **664200** Psychology/Mathematics IV

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