FACULTY OF SCIENCE
HANDBOOK

CALENDAR
1986

Volume 10
This Volume is intended as a reference handbook for students enrolling in courses conducted by the Faculty of Science.

The colour band, Topaz BCC4, on the cover is the lining colour of the hood of Bachelors of Science of this University.

The information in this Handbook is correct as at 1 September 1985.

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. 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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FACULTY OF SCIENCE

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.

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 Metallurgy;
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."
Faculty Officers
Dean
R. J. Macdonald, BSc, PhD(New South Wales), FAIP

Sub-Deans
R. A. Fredlein, BSc, PhD(Queensland), ARACI
P. V. Smith, BSc, PhD(Monash), MAIP

Faculty Secretary

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Professor
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R. C. Jones, BSc(New South Wales), PhD(Sydney) (Head of Department)

Senior Lecturers
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R. N. Murdoch, BScAgr(Sydney), PhD(Macquarie)
J. W. Patrick, BScAgr(Sydney), PhD(Macquarie)
T. K. Roberts, BSc(Adelaide), PhD(Edinburgh)
R. J. Rose, BScAgr(Sydney), PhD(Macquarie)

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Tutor
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Departmental Office Staff
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Teaching Assistant
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Kathleen D. Hill

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K. H. R. Modle, Abs, DrPhil(Innsbruck), AAuslMM
S. St. J. Warne, BSc(Western Australia), PhD(New South Wales), FGS, FGAA, FMSA, FAIE

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P. K. Seccombe, MSc(Melbourne), PhD(Manitoba)

Lecturer
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Honorary Associate
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Departmental Office Staff
Marcia Shilcock
Barbara Saksor

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J. Symon, BSc(Oslo)

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Departmental Office Staff
Marie Wallin
Pam Warson

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L. J. Henderson

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(Head of Department)
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R. W. Gibberd, BSc, PhD(Adelaide)
J. R. Giles, BA(Sydney), PhD; DipEd(Sydney), ThL
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V. Ficker, PromMat, CSC, RNDT(Comenius)
W. T. F. Lau, ME(New South Wales), PhD(Sydney), MAIAA
D. L. S. McElwain, BSc(Queensland), PhD(York (Canada)), MACS
T. K. Sheng, BA(Marian College), BSc(Malaya & London), PhD(Malaya)

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C. J. Ashman, BA, LitB(New England), PhD
B. Breasford-Smith, BSc(ANU)
R. F. Berghoef, MSc(Sydney)
J. G. Couper, BSc, PhD(New England)
M. J. Hayes, BA(Cambridge)
Simon, BSc, BA(James Cook), DipCompSc, MMath
G. W. Southern, BSc(Adelaide), MMath, DipCompSc
W. C. Summerveld, BSc(Adelaide), PhD(Edinburgh)
W. P. Wood, BSc, PhD(New South Wales) FRAS

Honorary Associate
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Computer Programmers
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A. Nymeyer, BMAT, DipCompSc

Departmental Office Staff
Cath Claydon
Jeanette Dennis
Jan Garney, BA(Sydney)
Sue McNeill
Vicki Piller
Information for Undergraduates

Students may choose subjects from the Departments of Geology, Physics, Chemistry, Biological Sciences, Psychology, Geography and Mathematics, Statistics and Computing. 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 Australasian Institute of Mining & Metallurgy has a code of ethics for professional behaviour to which members are expected to adhere. From 30 June, 1986, 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 $50 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 1986. However, Science students taking subjects from other faculties must examine the timetable to ensure that clashes do not exist in their proposed courses.

### Biological Sciences

<table>
<thead>
<tr>
<th>Subject</th>
<th>Clashes</th>
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<tbody>
<tr>
<td>Biology IIA with</td>
<td>Geology IIA, Geology IIIA, Chemistry IIIB</td>
</tr>
<tr>
<td>Biology IIB with</td>
<td>Geology IIIA, Chemistry IIIB, Geology IIA</td>
</tr>
<tr>
<td>Biology IIIA with</td>
<td>Geology IIIB, Mathematics III (some topics)</td>
</tr>
<tr>
<td>Biology IIIB with</td>
<td>Chemistry IIIB, Physics IIIA, Geology IIIB</td>
</tr>
<tr>
<td>Biology IV with</td>
<td>Mathematics III (some topics)</td>
</tr>
</tbody>
</table>

### Chemistry

<table>
<thead>
<tr>
<th>Subject</th>
<th>Clashes</th>
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</thead>
<tbody>
<tr>
<td>Chemistry IIA with</td>
<td>Geology IIA, Geology IIIA</td>
</tr>
<tr>
<td>Chemistry IIB with</td>
<td>Mathematics III (some topics)</td>
</tr>
<tr>
<td>Chemistry IV with</td>
<td>Biology IIB, Biology IIIA</td>
</tr>
<tr>
<td>Chemistry V with</td>
<td>Biology IV, Physics IIIA, Geology IIIA</td>
</tr>
<tr>
<td>Chemistry VI with</td>
<td>Geology IIIB, Mathematics III (some topics)</td>
</tr>
</tbody>
</table>

### Geology

<table>
<thead>
<tr>
<th>Subject</th>
<th>Clashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geology IIA with</td>
<td>Chemistry IIIA, Biology IIA</td>
</tr>
<tr>
<td>Geology IIB with</td>
<td>Chemistry IIIA, Biology IIA</td>
</tr>
<tr>
<td>Geology IIIA with</td>
<td>Chemistry IIIB, Biology IIIA, Biology IV</td>
</tr>
<tr>
<td>Geology IIIB with</td>
<td>Chemistry IIIB, Biology V, Physics IIIA</td>
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<tr>
<td>Geology IIIC with</td>
<td>Mathematics III (some topics)</td>
</tr>
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</table>

### Mathematics

<table>
<thead>
<tr>
<th>Subject</th>
<th>Clashes</th>
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<tbody>
<tr>
<td>Mathematics I with</td>
<td>Psychology IIIB</td>
</tr>
<tr>
<td>Mathematics II with</td>
<td>Psychology IIIA, Psychology IIB, Physics IIIA, Chemistry IIIB</td>
</tr>
<tr>
<td>Mathematics III with (some topics only)</td>
<td>Biology IIIA, Biology IIIB</td>
</tr>
</tbody>
</table>

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### Subject Timetable Clashes

<table>
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<th>Subject</th>
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<tbody>
<tr>
<td>Biology IIA with</td>
<td>Geology IIA, Geology IIIA, Chemistry IIIB</td>
</tr>
<tr>
<td>Biology IIB with</td>
<td>Geology IIIA, Chemistry IIIB, Geology IIA</td>
</tr>
<tr>
<td>Biology IIIA with</td>
<td>Geology IIIB, Mathematics III (some topics)</td>
</tr>
<tr>
<td>Biology IIIB with</td>
<td>Chemistry IIIB, Physics IIIA, Geology IIIB</td>
</tr>
<tr>
<td>Biology IV with</td>
<td>Mathematics III (some topics)</td>
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</table>

### Biological Sciences

<table>
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<th>Subject</th>
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<tbody>
<tr>
<td>Biology IIA with</td>
<td>Geology IIA, Geology IIIA, Chemistry IIIB</td>
</tr>
<tr>
<td>Biology IIB with</td>
<td>Geology IIIA, Chemistry IIIB, Geology IIA</td>
</tr>
<tr>
<td>Biology IIIA with</td>
<td>Geology IIIB, Mathematics III (some topics)</td>
</tr>
<tr>
<td>Biology IIIB with</td>
<td>Chemistry IIIB, Physics IIIA, Geology IIIB</td>
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<td>Mathematics III (some topics)</td>
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### Chemistry

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<th>Subject</th>
<th>Clashes</th>
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<tbody>
<tr>
<td>Chemistry IIA with</td>
<td>Geology IIA, Geology IIIA</td>
</tr>
<tr>
<td>Chemistry IIB with</td>
<td>Mathematics III (some topics)</td>
</tr>
<tr>
<td>Chemistry IV with</td>
<td>Biology IIB, Biology IIIA</td>
</tr>
<tr>
<td>Chemistry V with</td>
<td>Biology IV, Physics IIIA, Geology IIIA</td>
</tr>
<tr>
<td>Chemistry VI with</td>
<td>Geology IIIB, Mathematics III (some topics)</td>
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</table>

### Geology

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<td>Geology IIIB with</td>
<td>Chemistry IIIB, Biology V, Physics IIIA</td>
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<td>Mathematics III (some topics)</td>
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### Mathematics

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<thead>
<tr>
<th>Subject</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Mathematics I with</td>
<td>Psychology IIIB</td>
</tr>
<tr>
<td>Mathematics II with</td>
<td>Psychology IIIA, Psychology IIB, Physics IIIA, Chemistry IIIB</td>
</tr>
<tr>
<td>Mathematics III with (some topics only)</td>
<td>Biology IIIA, Biology IIIB</td>
</tr>
</tbody>
</table>
Physics
Physics IIIA with Biology IIIIB
Chemistry IIIB
Geology IIIIB
Mathematics III (some topics)

Psychology
Psychology IIIB with Mathematics II (some topics)
Psychology IIIA with Mathematics III (some topics)
Psychology IIIB with Mathematics III (some topics)

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
Prospective science degree students are advised to include four units of Science and at least two units of Mathematics in their H.S.C. programme. Although prerequisites are not at present prescribed, unless otherwise indicated students are advised that study of some subjects is extremely difficult unless advisory prerequisites have already been completed at the 30th percentile or above.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Advisory prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology I</td>
<td>Chemistry (2-unit course) or Multistrand (4-unit course).</td>
</tr>
<tr>
<td>Chemistry I</td>
<td>Mathematics (2-unit course), Physics (2-unit course) and Chemistry (2-unit course), with ranking in the top 50% in each case.</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 1A</td>
<td>Mathematics (3-unit course) and Physics (2-unit course).</td>
</tr>
<tr>
<td>Physics 1B</td>
<td>Physics (2-unit course) or Multistrand (4-unit) Science.</td>
</tr>
<tr>
<td>More stringent prerequisites will apply to those wishing to enter the Faculty from 1987 onwards. Further details may be obtained from the Faculty Secretary.</td>
<td></td>
</tr>
</tbody>
</table>

Student Advice
Students who have problems should feel free to seek the advice of the DEAN, A SUB-DEAN, the appropriate HEAD OF DEPARTMENT OR A MEMBER OF THE TEACHING STAFF whose area of responsibility relates to the particular problem concerned.

THE UNIVERSITY COUNSELLING SERVICE is also available to help with broad educational problems on planning life goals as well as personal difficulties.

Russian for the Scientist and Mathematician

FORMAL ENROLMENT NOT NECESSARY
The following study may be available during the year.

Prerequisites
None, although familiarity with a modern language would be of advantage.

Hours
Approximately 27 lecture hours

Examination
None

Content
This is a voluntary course designed to give students and members of staff a working knowledge of scientific and technical Russian. Translation from Russian into English is costly, and only a very small proportion of the Soviet Union's technical literature is routinely translated into English. Often translation of the abstract alone is sufficient to determine whether a complete translation is warranted. Emphasis throughout the course will be on translation from Russian into English, although both written and spoken Russian will necessarily be involved. The course should provide a good introduction for those seeking a somewhat more literary understanding of the language.

Further details may be obtained from the Department of Mathematics.

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 Diploma 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 methods a Part III subject in the main teaching area and a Part II subject in another teaching area.

For primary methods 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.
REGULATIONS RELATING TO THE DEGREE OF BACHELOR OF SCIENCE

1. These Regulations prescribe the requirements for the 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. Grading of Degree
The degree may be conferred either as an ordinary degree or as an honours degree.

4. 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.

5. 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 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.

6. 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.

7. 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.

THE ORDINARY DEGREE

8. Enrolment
(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:

9. Qualification for Admission to the Degree
To qualify for admission to the ordinary degree a candidate shall pass nine subjects presented in accordance with the provisions of Regulations 14 and 15 of these Regulations.

10. 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 he has been admitted or is eligible for admission.

11. 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, Chemistry, 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 IIIC if either Psychology II A or Psychology IIIB is included;
(d) Geology IIIC if either Geology II IA or Geology IIIB is included;
(e) Psychology IIIC if either Psychology II IA or Psychology II IB is included.

(4) 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.

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

* Subject offered in the Faculty of Mathematics
13. Results
The result obtained by a successful candidate in a subject shall be: Terminating Pass, Pass, Credit, Distinction or High Distinction.

THE HONOURS DEGREE

14. Admission to Candidature
In order to be admitted to candidature for the honours degree an applicant shall:
(a) have completed the requirements for admission to the ordinary degree;
(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.

15. Qualification for Admission to the Degree
To qualify for admission to the honours degree a candidate shall, in one year of full-time study or two years of part-time study, pass one of the following subjects:

| Biology IV | Geology IV |
| Chemistry IV | Physics IV |
| Geography IV | Psychology IV |

16. 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 2.

17. Combined Honours
A candidate may qualify for admission to a combined honours degree by passing, in one year of full-time study or two years of part-time study, one of the following combined subjects, namely —

- Geology/Mathematics IV
- Physics/Mathematics IV
- Psychology/Mathematics IV

18. Regulations 14 and 16 of these Regulations shall apply to a combined honours degree. The references in Regulation 14 to the Head of Department shall be construed as references to the Head of each Department offering a component part of the combined subject.

COMBINED DEGREE COURSES

19. 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.

20. 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.

21. 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 as shall be certified by the Deans of the two Faculties.

22. To qualify for admission to the two degrees a candidate shall satisfy the requirements for both degree except as provided in Regulations 26, 27 and 28 of these Regulations.

23. 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 Arts and all the requirements for the degree of Bachelor of Science other than those prescribed in Regulations 1(3) and 15, 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 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.

24. 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:

- five subjects, being Mathematics I, Mathematics II, Mathematics III, Mathematics IIA and another Part III subject chosen from the Schedule of Subjects approved for the degree of Bachelor of Mathematics;
- six subjects chosen from the other subjects listed in the Schedule of Subjects approved for the degree of Bachelor of Science; and
- 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 III C shall not be entitled to count either Psychology IIA 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.

25. 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>PART I</td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
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<tr>
<td>Computer Science</td>
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<tr>
<td>Computer Science</td>
<td></td>
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<tr>
<td>Geography</td>
<td></td>
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<tr>
<td>Geology</td>
<td></td>
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<tr>
<td>Mathematics</td>
<td></td>
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<tr>
<td>Mathematics</td>
<td></td>
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<tr>
<td>Physics 1A</td>
<td></td>
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<tr>
<td>Physics 1B</td>
<td></td>
</tr>
<tr>
<td>Psychology</td>
<td></td>
</tr>
</tbody>
</table>

Only one of these two subjects may be taken.
<table>
<thead>
<tr>
<th>Subject</th>
<th>Remarks, Prerequisites, Corequisites, Preparatory Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PART II</strong></td>
<td></td>
</tr>
<tr>
<td>Biology IIA</td>
<td>Prerequisite: Biology I</td>
</tr>
<tr>
<td>Biology IIB</td>
<td>Prerequisite: Biology IIA or IIB</td>
</tr>
<tr>
<td>Chemistry IIA</td>
<td>Preparatory Subjects: Mathematics I &amp; either Physics IA or Physics IB</td>
</tr>
<tr>
<td>Chemistry IIIB</td>
<td>Corequisite: Chemistry I</td>
</tr>
<tr>
<td>Geology IIA</td>
<td>Corequisite: Chemistry IIA/Advisory</td>
</tr>
<tr>
<td>Computer Science II</td>
<td>Preparatory Subject: Physics IIA or IB</td>
</tr>
<tr>
<td>Electronics &amp; Instrumentation II</td>
<td>Corequisite: a Part III subject approved by the Faculty Board on the recommendation of the Head of the Dept. of Physics.</td>
</tr>
<tr>
<td>Geography IIA</td>
<td>Prerequisite: Geography I</td>
</tr>
<tr>
<td>Geography IIB</td>
<td>Prerequisite: Geography I</td>
</tr>
<tr>
<td>Mathematics IIA</td>
<td>Prerequisite: Mathematics I</td>
</tr>
<tr>
<td>Mathematics IIB</td>
<td>Corequisite: Mathematics IIA</td>
</tr>
<tr>
<td>Mathematics IIIA</td>
<td>Preparatory Subjects: Mathematics I &amp; Physics IA or Physics IB</td>
</tr>
<tr>
<td>Physics II</td>
<td>Preparatory Subject: Psychology I</td>
</tr>
<tr>
<td>Psychology II A</td>
<td>Corequisite: Psychology IIA</td>
</tr>
<tr>
<td>Psychology II B</td>
<td></td>
</tr>
<tr>
<td><strong>PART III</strong></td>
<td></td>
</tr>
<tr>
<td>Biology IIIA</td>
<td>Prerequisite: Biology IIA</td>
</tr>
<tr>
<td>Biology IIB</td>
<td>Prerequisite: Biology IIA or IIB</td>
</tr>
<tr>
<td>Chemistry IIIA</td>
<td>Preparatory Subjects: Mathematics I &amp; Chemistry IIA</td>
</tr>
<tr>
<td>Chemistry IIIB</td>
<td>Corequisite: Chemistry IIA</td>
</tr>
<tr>
<td>Geography IIIA</td>
<td>Prerequisite: Geography IIA</td>
</tr>
<tr>
<td>Geography IIIB</td>
<td>Prerequisite: Geography IIB</td>
</tr>
<tr>
<td>Geology IIIA</td>
<td>Prerequisite: Geology IIA</td>
</tr>
<tr>
<td>Geology IIIB</td>
<td>Preparatory Subject: Geology I</td>
</tr>
<tr>
<td>Preparatory Subjects:</td>
<td>Preparatory Subject: Mathematics I IA or Physics I or Physics IB</td>
</tr>
<tr>
<td>Geography IIB</td>
<td>Corequisite: Geology IIA</td>
</tr>
<tr>
<td>Mathematics IIIA</td>
<td>Corequisite: Mathematics IIA and IIC</td>
</tr>
<tr>
<td>Physics IIIA</td>
<td>Preparatory Subjects: Physics II and at least one Part II</td>
</tr>
<tr>
<td>Physics IIIIB</td>
<td>Corequisite: Physics IIA</td>
</tr>
<tr>
<td>Mathematics IIIA</td>
<td>Preparatory Subjects: Mathematics II and IIC</td>
</tr>
<tr>
<td>Physics IIIIB</td>
<td>Corequisite: Physics IIA</td>
</tr>
<tr>
<td>Psychology IIIA</td>
<td>Corequisite: Psychology IIA</td>
</tr>
<tr>
<td>Psychology III B</td>
<td></td>
</tr>
</tbody>
</table>

**SM III (Calculus, Differential Equations & Related Topics)**

| Prerequisite: Mathematics II or III plus a Part II subject offered by a Department in the Faculty of Science |
| Corequisite: A Part III subject offered by a Department in the Faculty of Science |

**Statistics III**

| Prerequisite: Mathematics IIIA and Mathematics IIC (including topics CO, H and I). |

1. Preparatory subjects are those which students are strongly advised to have completed before enrolling in the subject for which a preparatory subject is recommended.
2. Before enrolling in a Part II subject, a candidate who intends proceeding to the honours degree should consult with the Head of Department.

**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.

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 enrolls 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 IIA, Psychology IIB, Psychology IIIA, Psychology IIIB, 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 IA 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.

(c) 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.

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>
</tr>
</thead>
<tbody>
<tr>
<td>subjects</td>
<td>subjects</td>
<td>subjects</td>
<td>subjects</td>
</tr>
<tr>
<td>(a)</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>(b)</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>(c)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</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

<table>
<thead>
<tr>
<th>PART I</th>
<th>Prerequisite</th>
<th>Corequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PART II</td>
<td>Psychology IIA</td>
<td>Psychology I</td>
</tr>
<tr>
<td>Psychology IIB</td>
<td>Psychology I</td>
<td></td>
</tr>
<tr>
<td>PART III</td>
<td>Psychology IIIA</td>
<td>Psychology IIIA</td>
</tr>
<tr>
<td>Psychology IIIB</td>
<td>Psychology IIIB</td>
<td>Psychology IIIA</td>
</tr>
<tr>
<td>PART IV</td>
<td>Psychology IVP</td>
<td>9 subjects including Psychology IIIA</td>
</tr>
<tr>
<td>or Psychology IV</td>
<td>9 subjects including Psychology IIIA with a Credit level in either Psychology IIIA or IIIB or approval of Head of Department</td>
<td></td>
</tr>
</tbody>
</table>

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:

- 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 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. (1) To qualify for the Diploma a candidate shall enrol and shall complete to the satisfaction of the Faculty Board a programme consisting of:

- (a) lectures, tutorials and practical work as determined by the Faculty Board on the recommendation of the Head of the Department; and
- (b) two reports, each embodying the result of a project, at least one of which shall be field-oriented.

(2) Except with the permission of the Faculty Board given on the recommendation of the Head of the Department, the programme shall be completed in not less than two years of part-time enrolment.

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

7. In cases where a candidate's performance in the programme has reached a level determined by the Faculty Board the Diploma may be awarded with merit.

8. In order to provide for exceptional circumstances arising in particular cases, the Senate, on the recommendation of the Faculty Board, may relax any of the provisions 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 to a degree in 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:

- (a) (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 III 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 candidacy 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) An applicant 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 and Master of Scientific Studies.
   (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 candidacy 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 candidacy 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 as otherwise 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 candidacy shall be considered by the Faculty Board which may approve or reject any application.

(3) An applicant shall not be admitted to candidacy 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, shall be entitled to apply to the University in writing for an appeal against such decision.

(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 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 examinations 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 THESSES

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.

(2) The thesis shall not contain as its main content any work or material which has previously been submitted by the candidate for a degree in any tertiary institution unless the Faculty Board otherwise permits.

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.

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 (Com), 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 12 of these Regulations, a third examiner shall be appointed either by the Faculty Board or otherwise as prescribed in the Schedule.

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.

1 At present there is no fee payable.
4. (I) The Board shall consider each application for admission to candidature and shall make a decision thereon.

(2) Before approving an admission 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.

(3) Before an application for admission to candidature is approved, the Board shall be satisfied that adequate supervision and facilities are available.

(4) In considering an application, the Board shall take account of the applicant's academic qualifications and experience, the report of an interview with the applicant and any other selection procedures applied to the applicant as determined by the Board. The interview and selection procedures shall be conducted by a Selection Committee approved by the Board.

5. (I) 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. (I) 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. (I) The Faculty of Science shall be responsible for the course leading to the degree of 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 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 Board; and

(c) have at least two years teaching or other relevant practical experience approved by the Board.

4. (I) 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.

(3) In considering an application, the Board shall take account of the applicant's academic qualifications and experience, and also the report of an interview with the applicant and any other selection procedures applied to the applicant as determined by the Board, which shall be conducted by a Selection Committee approved by the Board.

5. (I) 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. (I) 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 11 — 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. (I) 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 candidate 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.

(3) 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.

4. 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.

Combined Degree Courses

Any student contemplating enrolment in a combined degree course under BSc degree Regulations 22-28 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 BSc 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 BSc 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 IIA and Mathematics IIC, and another Part I subject.

Year III
Mathematics IIA plus two other subjects which must include at least one Part III subject.

Year IV
Either Mathematics IIB 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

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, 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.

IMPORTANT REGULATIONS

Students should note that degree and diploma regulations and requirements are intended to supplement the general regulations and are in their turn supplemented by 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.
   (b) Examination
   A summary of the contents of these Regulations is included in the centre pages of this Handbook.

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 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 part of the course or to the University, it may impose such a limit and determine the manner of selection of those persons to be so admitted.

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 under Regulation 7 of these Regulations.

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 to the University, it may impose such a limit and determine the manner of selection of those persons to be so admitted.

Unsatisfactory Progress
These Regulations are reprinted in the centre pages of this Handbook.
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 enrols 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 Science

Entry to Mathematics subjects at the part II 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.

DEPARTMENT OF BIOLOGICAL SCIENCES

711100 Biology I

N.B. It is expected that in future this subject will not be offered in the evenings in even years.

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 (17th to 23rd February, 1986, between 10.00 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 tutorial and laboratory classes per week. A two-day excursion.

Examination
Two 3-hour papers

Content
Cells, Molecules and Organelles
Proteins, carbohydrates, lipids.
Organisation of cells, cell cycle.
Biological Energy Processes

Diversity of Organisms

Plant Classification and Processes
Plant Kingdom. Structure, function and development of higher plants.

Animal Classification and Processes

Immunology
Antigens and antibodies. Blood groups.

Genetics and Development

Population Biology
An introduction to ecology, population genetics and evolution.

Human Biology

The practical classes will present exercises relevant to these topics.

Texts
Curtis, H. Biology 4th edn (Worth 1983)
Martin, E. A. A Dictionary of Life Sciences (Pan 1976)
References
Ayala, F. M. & Kiger, J. A.
Clarke, R. B. & Panchen, A. L.
Moroney, M. J.
Parker, R. E.
Rayle, D. & Wedberg, L.

Molecular and Cellular Biology

Clarke, R. 8.

Cell Biology

Ayala, F. M.

Biochemistry

Rayle, D.

Normal distribution. Tests of significance. Correlation, Regression. The practical classes will present exercises relevant to these fields. Tutorials will deal with biological topics of interest, and provide practice in statistical evaluation of biological data.

References
Alberts, B., Bray, D., Lewis, J., Raff, M., Roberts, K. & Watson, J. D.
Bailey, N. T. J.
Friedfelder, D.
Lehrnier, A. L.

Biochemistry


Cell Biology

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

Statistics
Normal distribution. Tests of significance. Correlation, Regression. The practical classes will present exercises relevant to these fields. Tutorials will deal with biological topics of interest, and provide practice in statistical evaluation of biological data.

Texts
Alberts, B., Bray, D., Lewis, J., Raff, M., Roberts, K. & Watson, J. D.

Molecular Biology of the Cell (Garland Publishing 1983)

Biology I

3 lecture hours and 6 hours tutorial and laboratory classes per week.

Two 3-hour papers

712100 Biology IIA
712103 Biochemistry
712102 Cell Biology

712200 Biology IIB
712201 Comparative Structure & Function
712203 Animal Ecology

Prerequisites

Biology I

Hours

Two 3-hour papers

Comparative Structure and Function
Evolutionary development of particular structures in terms of their functional capacities to solve environmental problems.

Ecology
Physical and biological factors influencing the abundance and distribution of organisms. Determination and measurement of these factors.

Statistics

The practical classes will present exercises relevant to these fields. Tutorials will deal with biological topics of interest, and provide practice in statistical evaluation of biological data.

Examination

3 lecture hours and 6 hours tutorial and laboratory classes per week. A two day excursion.

Examination

Two 3-hour papers

Cost

Comparative Structure and Function
Evolutionary development of particular structures in terms of their functional capacities to solve environmental problems.

Ecology
Physical and biological factors influencing the abundance and distribution of organisms. Determination and measurement of these factors.

Statistics

The practical classes will present exercises relevant to these fields. Tutorials will deal with biological topics of interest, and provide practice in statistical evaluation of biological data.

Texts
Bailey, N. T. J.
Fricke, R. & Randall, D.
Krebs, C. J.
Sutcliffe, J.

Statistical Methods in Biology (English U.P.)
Animal Physiology Mechanisms and Adaptations 3rd edn (Freeman & Co., San Francisco 1983)
Ecology 2nd edn (Harper & Row)
Plants and Water 2nd edn (Arnold 1977)

References
Baker, D. A.
Bell, P. & Woodcock, C.
Bloom, W. & Fawcett, D. W.
Clark, L. R. et al.
Darnell, R. M.
Pianka, E. R.
Prosper, C. L.
Recher, H., Lunney, D. & Dunn, I. (eds)
Ruch, T. C. & Patton, H. D.
Ryan, J., T. A., Joiner, B. L. & Ryan, B. F.
Schmidt-Nielsen, K.
Torrey, T. W. & Feduccia, A.

Transport Phenomena in Plants (Chapman & Hall 1978)
The Diversity of Green Plants 2nd edn (Edward Arnold 1971)
A Textbook of Histology 10th edn (W. B. Saunders 1975)
The Ecology of Insect Populations in Theory and Practice (Methues)
Organism and Environment (Freeman)
Evolutionary Ecology (Harper & Row)
Comparative Animal Physiology 3rd edn (Saunders 1973)
A Natural Legacy — Ecology in Australia (Pergamon Press 1979)
Physiology and Biophysics. II. Circulation Respiration and Fluid Balance 20th edn (Saunders 1974)
Minitab Student Handbook (Duxbury Press 1976)
Animal Physiology Adaption and Environment (Cambridge U.P. 1975)
Morphogenesis of the Vertebrates 4th edn (John Wiley 1979)
Biology IIIA

Biology IIIA consists of two units, Developmental Biology, and Immunology and Cell Processes. It is possible to substitute a unit from Biology IIIB for either of these Biology IIIA units, allowing flexibility of choice of topics.

Biology IIIA, Topic 1

713101 Developmental Biology

Prerequisite
Biology IIA

Hours
4 lecture hours and 8 hours tutorial and laboratory classes per week for 14 weeks

Examination
One 3-hour paper

Content
Animals
Various aspects of development in animals at the molecular and cellular level. Topics include cellular differentiation, control mechanisms and gene expression and genetic regulation.

Plants
Cell and molecular biology of plant development. Hormonal, environmental and genetic control are considered. Topics also included are the development, architecture and nucleic acids of chloroplasts; and the application of cell and molecular biology and genetic engineering to plant improvement.

Text

References


Biology IIIA, Topic 2

713103 Immunology and Cell Processes

Prerequisites
Biology IIA

Hours
4 lecture hours and 8 hours tutorial and laboratory classes per week for 14 weeks

Examination
One 3-hour paper

Content
Hormones, Blood and Digestion
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.

Immunology
Molecular and cellular aspects. Emphasis will be on understanding at a molecular level both cellular and humoral immunity.

Texts
Roitt, I. Essential Immunology (Blackwell 5th edn 1984)

or Bellanti, J. A. Immunology (Saunders 2nd edn 1985)

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

Martin, C. R. Textbook of Endocrine Physiology (Williams & Wilkins 1976)


713200 Biology IIIB

Biology IIIB consists of two units, Physiology, and Ecology and Environmental Physiology. It is possible to substitute a unit from Biology IIIA for either of these Biology IIIB units, allowing flexibility of choice of topics.

Biology IIIB, Topic 3

713205 Physiology

Prerequisites
Biology IIA or IIB

Hours
4 lecture hours and 8 hours tutorial and laboratory classes per week for 14 weeks

Examination
One 3-hour paper

Content
Plants
The operation of key physiological processes including photosynthesis, mineral ion acquisition and assimilate transfer.

Animals
Biology of reproduction with particular emphasis on gamete physiology.

Texts
Baker, D. A. Transport Phenomena in Plants (Chapman & Hall 1978)

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

References
Austin, C. R. & Short, R. V.
Bloom, W. & Fawcett
Evans, L. T.
Leopold, A. C. & Kriedemann, P. E.
Seitchell, B. P.
Torrey, T. W. & Feduccia, A.

Reproduction in Mammals Vols. 1-8 (Cambridge 1972)
A Textbook of Histology 10th edn (Saunders 1975)
Crop Physiology (Paper back ed. Cambridge University Press)
Plant Growth and Development (McGraw-Hill 1975)
The Mammalian Testis (Paul Elek 1978)
Morphogenesis of the Vertebrates 4th edn (John Wiley 1979)

Biology HIB, Topic 4

713206 Ecology and Environmental Physiology

Prerequisites Biology IIA or IIB

Hours 4 lecture hours and 8 hours tutorial and laboratory classes per week for 14 weeks. Two three day excursions.

Examination One 3-hour paper

Content Ecology Structure and dynamics of biological communities, evolutionary ecology.
Environmental Physiology Adaptation of organisms in relation to their environment.

Text Krebs, C. J.
Ecology 2nd edn (Harper & Row)

References
Daubenmire, R. F. Plants and Environment 3rd edn (Wiley 1974)

714100 Biology IV

Prerequisite Nil

Hours

Examination To be advised

GENERAL INFORMATION
The University of Newcastle Calendar consists of the following volumes:

Volume 1 — Legislation:
Part 1 — The University of Newcastle Act,
Part 2 — By-laws and Regulations,
Part 3 — Bodies Established by Resolution of Council,
Part 4 — Scholarships, Prizes and Financial Assistance.

Volume 2 — University Bodies and Staff:
Part 1 — Principal Officers, Council, Senate, Boards and Committees,
Part 2 — The Professors and Staff.

Volume 3 — Handbook, Faculty of Architecture
Volume 4 — Handbook, Faculty of Arts
Volume 5 — Handbook, Faculty of Economics and Commerce
Volume 6 — Handbook, Faculty of Education
Volume 7 — Handbook, Faculty of Engineering
Volume 8 — Handbook, Faculty of Mathematics
Volume 9 — Handbook, Faculty of Medicine
Volume 10 — Handbook, Faculty of Science
Volume 11 — Annual Report

All volumes, except Volume 1 — Legislation, are published annually.

Volume 1 — Legislation is published irregularly the last issue being 1982.

All volumes except Volumes 2 Staff and 11 Annual Report are available on microfiche.

Other Publications
Undergraduate Prospectus
Postgraduate Prospectus
An ABC for New Students
University News
Gazette

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VI CAMPUS TRAFFIC & PARKING
I PRINCIPAL DATES 1986

January
1 Wednesday
10 Friday
13 Monday
24 Friday
27 Monday
31 Friday

Public Holiday — New Year's Day
Last day for return of Application for Re-Enrolment Forms — Continuing Students
Deferred Examinations begin
Deferred Examinations end
Public Holiday — Australia Day
Closing date for applications for residence in Edwards Hall

February
5 Wednesday
7 Friday
10 Monday to
17 Monday
18 Tuesday
24 Monday

New students attend in person to enrol and pay charges
Re-enrolment Approval Sessions for Re-Enrolling
Late enrolment session for new students
First Term begins

March
28 Friday

Good Friday — Easter Recess commences

April
2 Wednesday
25 Friday
28 Monday

Lectures resume
Public Holiday — Anzac Day
Last day for withdrawal without academic penalty from first half year subjects (See page (vii) for Dean’s discretion)

May
2 Friday
19 Monday
23 Friday
26 Monday

First Term ends
Examinations begin
Examinations end
Second Term begins

June
9 Monday
13 Friday
28 Saturday
30 Monday

Public Holiday — Queen’s Birthday
Last day for return of Confirmation of Enrolment forms
Examinations begin
Closing date for Applications for Selection to the Bachelor of Medicine course in 1987

July
12 Saturday
Examinations end

August
11 Monday
15 Friday
18 Monday
22 Friday

Last day for withdrawal without academic penalty from full year subjects
Second Term ends
Examinations begin
Examinations end

September
8 Monday
29 Monday

Third Term begins
Last day for withdrawal without academic penalty from second half year subjects (See page (vii) for Dean’s discretion)

October
1 Wednesday
6 Monday
31 Friday

Closing date for Applications for Enrolment 1987 (Undergraduate courses other than Medicine)
Public Holiday — Labor Day
Third Term ends

November
10 Monday
26 Wednesday

Annual Examinations begin
Annual Examinations end

Note: Term dates for students in the Bachelor of Medicine course are printed in Calendar Volume 9 — Medicine Handbook.

1987

January
12 Monday
23 Friday

Deferred Examinations begin
Deferred Examinations end

March
2 Monday

First Term begins
II GENERAL INFORMATION

1. 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.

2. 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 10 January 1986.

3. Re-Enrolment by Continuing Students
There are four steps involved for re-enrolment by continuing students:
- collection of the re-enrolment kit
- lodging the Application for Re-enrolment form with details of your proposed programme
- 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 21 to 25 October 1985 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 1986 Class Timetable, the Statement of Charges Payable for 1986 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 10 January 1986. It can be lodged in November or December, but it is very important that the Application for Re-enrolment form is lodged by 10 January 1986 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 10-17 February 1986. Enrolment Approval dates are on notices 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 1986 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 1986. 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.

The Cashier's Office will be open for extended hours during the enrolment approval sessions in the period 10-17 February 1986. 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 10-17 February 1986, 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 should be carried by students when at the University as evidence of enrolment. The Student Card has machine readable lettering 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 1985, 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 close with the UCAC on 1 October each year. There is a $40 fee for late applications.

Attendance Status
A candidate for 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.

A candidate for a postgraduate qualification shall enrol as either a full-time or a part-time student as determined by the Faculty Board.

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.
Students are requested to pay any debts incurred without delay.

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 Dates

<table>
<thead>
<tr>
<th>Full Year Subjects</th>
<th>First Half-Year Subjects</th>
<th>Second Half-Year Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>Monday</td>
<td>Monday</td>
</tr>
<tr>
<td>11 August 1986</td>
<td>28 April 1986</td>
<td>29 September 1986</td>
</tr>
</tbody>
</table>

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 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.

Indebtedness
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

- complete enrolment in a following year;
- 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 the 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.

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

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.

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 B01 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: 19 to 23 May, 1986
- Mid Year: 30 June to 11 July, 1986
- End of Second Term: 18 to 22 August, 1986
- End of Year: 10 to 28 November, 1986

Timetables showing the time and place at which individual examinations will be held will be posted on the examinations notice board near Lecture Theatre B01 (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 where necessary. 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 bringing into a room a programmable calculator;
(b) to a student who uses a calculator incorrectly; or
(c) because of battery failure.

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;

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

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.

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 6 January 1987.

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 Examinations
When considering the examination results Faculty Boards take into consideration any circumstances such as illness or personal problems which may have seriously affected a student's work during the year or during the examinations. Any student who considers that his work has been affected in this way or who is unable to attend for any examination and who wishes to apply for special consideration should write to the Secretary explaining the circumstances and, in the case of illness, enclosing a medical certificate (see Regulation 12 (2) of the Examination Regulations, Calendar Volume I).

If a student is affected by illness during an examination and wishes to ask for a Special Examination he must report to the supervisor in charge of the examination and then make written application to the Secretary as soon as possible after the examination (see Regulation 12 (3) of the Examination Regulations, Calendar Volume I).

Deferred Examinations
The Boards of the Faculties of Architecture, Engineering, and Mathematics may grant deferred examinations. Such examinations, if granted, will be held in January-February and candidates will be advised by mail of the times and results of the examinations.

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 by mail after the release of the End of Year examination results and will be informed of the procedure to be followed if they wish to 'show cause'.

Appeals against exclusion must be lodged together with Application for Re-enrolment forms by Friday 10 January 1986.

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 Council under 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.
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.
V CHARGES

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 10-17 February 1986).

Charges

1. General Services Charge
   (a) Students proceeding to a Degree or Diploma .................. $166 Per annum
   (b) Non-Degree Students Newcastle University Union charge ........ $75 Per annum

   The exact amount must be paid in full by the prescribed date.

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 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) Review of examination results .......................... $8 per subject
   (c) Statement of matriculation status for non-members of the
       University .............................................. $8
   (d) Replacement of Re-enrolment kit ......................... $10
   (e) Re-enrolment after the prescribed
       re-enrolment approval session ......................... $10
   (f) Replacement of Student Card ........................... $5

4. 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.

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 made 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, 24 February, 1986 .................. 100%
   Notification on or before Friday, 21 March, 1986 .................. 90%
   Notification on or before Friday, 27 June, 1986 .................. 50%

No refund will be made before 31 March, 1986.

Higher Degree Candidates

Higher degree candidates are required to pay 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.

VI CAMPUS TRAFFIC AND PARKING

Persons wishing to bring motor vehicles (including motor cycles) onto 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:

<table>
<thead>
<tr>
<th>Type of Offence</th>
<th>Maximum Fine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driving offences - including speeding and dangerous driving</td>
<td>up to $15</td>
</tr>
<tr>
<td>Failing to stop when signalled to do so by an Attendant (Patrol)</td>
<td>up to $30</td>
</tr>
<tr>
<td>Refusing to give information to an Attendant (Patrol)</td>
<td>up to $30</td>
</tr>
<tr>
<td>Failing to obey the directions of an Attendant (Patrol)</td>
<td>up to $30</td>
</tr>
</tbody>
</table>

The Traffic and Parking Regulations are stated in full in the Calendar, Volume 1.
### 721100 Chemistry I

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Nil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisory Prerequisites</td>
<td>At least Mathematics (2-unit course), Physics (2-unit course) and Chemistry (2-unit course) with ranking in the top 50% in each case.</td>
</tr>
<tr>
<td>Hours</td>
<td>About 3 lecture hours and 3 hours of tutorial and laboratory classes per week.</td>
</tr>
<tr>
<td>Examination</td>
<td>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.</td>
</tr>
</tbody>
</table>
| Content | **Inorganic Chemistry** (30 lectures)  
Revision of basic concepts; periodic properties of the elements and their compounds; bonding and structure; co-ordination compounds.  
**Organic Chemistry** (30 lectures)  
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** (30 lectures)  
Chemical equilibria; thermodynamics; electrochemistry; chemical kinetics. |
| Texts | **S.I. Chemical Data 2nd edn** (Wiley 1974)  
**Organic Chemistry 6th edn** (Houghton Mifflin 1983)  
**Chemistry — The Central Science 2nd edn** (Prentice-Hall 1981) |

### 722200 Chemistry IIA

<table>
<thead>
<tr>
<th>Prerequisite</th>
<th>Chemistry I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparatory Subjects</td>
<td>Mathematics I &amp; either Physics IA or IB</td>
</tr>
<tr>
<td>Hours</td>
<td>About 3 lecture hours and 6 hours of tutorial and laboratory classes per week.</td>
</tr>
<tr>
<td>Examination</td>
<td>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.</td>
</tr>
</tbody>
</table>
| Content | **Analytical Chemistry**  
Basic principles of selected range of instrumental methods of analysis. |
721100 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 (30 lectures)
Revision of basic concepts; periodic properties of the elements and their compounds; bonding and structure; co-ordination compounds.

Organic Chemistry (30 lectures)
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 (30 lectures)
Chemical equilibria; thermodynamics; electrochemistry; chemical kinetics.

Texts
Aylward, G. H. & Findlay, T. J. V.
Hart, H.
Brown, T. L. & LeMay, H. E.

S.I. Chemical Data 2nd edn (Wiley 1974)
Organic Chemistry 6th edn (Houghton Mifflin 1983)

722200 Chemistry IIA

Prerequisite
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; π 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

Physical Chemistry 2nd edn (Oxford 1982)
An Introduction to Inorganic Chemistry
softback edn (Holt-Saunders 1980)
Principles of Instrumental Analysis 2nd edn (Saunders College, Philadelphia 1980)
Orbit Molecular Model Kit (Cochranes, Oxford)

Chemistry IIIA
This subject is offered in some years. It will not be given in 1986.

Prerequisites
Chemistry IIA (advisory)

Corequisites
Chemistry II A (advisory)

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.

Content
The units offered may vary from year to year and the topics available include: electronic instrumentation for chemists; problem solving; evaluation of chemical pollution; analysis in organic systems; radiochemistry; chemistry in industrial processes; polymers. In the industrial processes unit, attendance on factory excursions is compulsory.

Texts
To be advised

CHEMISTRY — PART III SUBJECTS

Prerequisites
Mathematics I; Chemistry IIA. Chemistry IIIA is a pre- or corequisite for Chemistry IIIB.

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 IIIA must select nine topics from the list provided by the Department. Likewise, students enrolling in Chemistry IIIB must nominate nine topics from the IIIB 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.

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

Hours
To be advised

Examination

Content
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

Material Geology
Introductory crystallography; mineralogy and petrology; classification of rocks; economic mineral deposits; applications of geology to engineering.

Physical Geology
Erosion cycle; agents of erosion; diastrophism; structural geology; marine geology; geomorphology.

Historical Geology
Introductory palaeontology and stratigraphy; brief geological history of Australia.

Texts

Texts
Either
Read, H. H. R. A. Elements of Mineralogy 24th edn (Murby 1960)
OR
Mason, B. & Berry, L. G. Mineralogy (Freeman 1959)
Uyeda, S. The New View of the Earth (Freeman 1978)

732200 Geology IIA

Prerequisite Geology I

Hours 4 lecture hours and 3 laboratory hours per week and 8 days field work

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

Content

Mineralogy
Crystallography and optical mineralogy.

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.

Texts
Bishop, A. C. An Outline of Crystal Morphology (Hutchinson 1967)
Clarkson, E. N. K. Invertebrate Palaeontology and Evolution (Allen & Unwin 1979)
Park, R. G. Foundations of Structural Geology (Blackie 1983)
Kerr, P. F. Optical Mineralogy (McGraw-Hill 1977)

732300 Geology IIB

This subject is offered only in odd-numbered years. It will not be given in 1986.

Prerequisite Geology I

Hours 4 lecture hours and 3 laboratory hours per week and 8 days field work

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

Content

Marine Geology — the morphology of ocean basins
Nature and origins of morphological features of the oceans and their floors. Destructive and constructive processes; submarine volcanicity; genesis types and potential of heavy and economic mineral deposits; the role of eustatic changes.

Introduction to Mineralogical and Petrological Techniques
Crystallography; methods of preparing materials for mineralogical and petrological examination; introduction to natural gem materials and synthetic and cultured gem materials; presentation of mineralogical and petrological data.

Environmental Geology
Development of Earth's primary and secondary atmospheres; importance of trace metals; bacterial oxygen demand; litho-, hydro- and atmospheric balances; waste disposal; geological hazards; mineral and energy resources — present and future demands.

Introduction to Engineering and Mining Geology
Geological parameters related to engineering works; geological hazards associated with foundations, stability problems, sampling and mining.

Extraterrestrial Geology
Origin of the solar system; structure; distribution, age, chemical characteristics and petrogenesis of lunar rocks; asteroides; meteorites; geology of other planets.

Palaeoecology
Application of ecological laws to modern and ancient plant and animal communities.

Texts
Francis, P. Volcanoes (Penguin 1976)
Till, R. Statistical Methods for the Earth Scientist (Macmillan 1974)
733100 Geology IIIA

**Prerequisites**
Geology I & II A

**Preparatory Subjects**
Chemistry I & either Physics IA or IB

**Hours**
5 lecture hours and 6 laboratory hours per week and 8 days field work. (Includes Geophysics lectures which are given during one week of the first vacation).

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

**Content**

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

**Sedimentology**
Petrogenesis of sedimentary rocks.

**Economic Geology**
Principles of formation of economic mineral deposits; textures of ore minerals; major Australian ore deposits; ore mineralogy.

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

**Photogrammetry and Photogeology**
Basic principles of photogrammetry and photogeological interpretation; aerial photographs and their use in cartography and in stratigraphic and structural studies.

**Micropalaeontology and Theoretical and Evolutionary Palaeontology**
Micropalaeontology, principles of taxonomy, quantitative methods; species concepts, genetics, evolution; selected evolutionary patterns from the palaeontological record.

**Geochronology and World Stratigraphy**
Principles of age dating; regional geology of selected provinces of the world.

**Exploration Geophysics**
Geophysical techniques — their interpretation and application in petroleum and mining exploration, and hydrogeological and engineering investigations.

**Texts**
Park, R. G. *Foundations of Structural Geology* (Blackie 1983)
Stanton, R. L. *Ore Petrology* (McGraw-Hill 1972)
For others, consult lecturers concerned.

733200 Geology IIIB

**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.

**Mineralogical and Geochemical Techniques**
X-ray diffraction and fluorescence; X-radiography; atomic absorption, infra-red and optical spectroscopy; differential thermal and thermogravimetric analysis; scanning and transmitted electron microscopy; the electron microprobe; differential staining techniques.

**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.

Types of stratigraphic maps and sections; numerical analysis of data strings; numerical map analysis.

**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.

**Mining and Engineering Geology**
Mechanical properties and behaviour of rocks; movement picture and movement plans; 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, micrometric 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.

**Texts**
Consult lecturers concerned.

734100 Geology IV

**Prerequisites**
Geology III A, 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.

664500 Geology/Mathematics IV
Prerequisites
Geology IIIA or IIC and Mathematics IIIA and such additional work as is required for combined honours students by the Department of Mathematics. A student desiring admission to this subject must apply in writing to the Dean of the Faculty of Science before 7th December of the preceding year.

Hours
Examination
To be advised

Content
At least four topics chosen from those available to honours students in Mathematics for the current year together with work offered by the Department of Geology for that year. The subject will also include a major thesis which embodies the results of a field research project involving the application of mathematical studies to a particular geological problem. Other work e.g. seminars and assignments may be required by either Department.

DEPARTMENT OF PHYSICS

741200 Physics IA
Prerequisite
Nil, however refer to Advisory Prerequisite for entry to the Faculty on p.14.

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.

741300 Physics IB
Prerequisite
Nil, however refer to Advisory Prerequisite for entry to the Faculty on p.15.

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.

742200 Electronics & Instrumentation II
This subject will not be offered in 1986.

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 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. Instrumentation for Scientists Series. Texts with Experiments Modules 1, 2, 3 & 4 (Benjamin).
742100 Physics II

Prerequisites
Physics IA and Mathematics I
Students achieving a pass at the level of credit or better in Physics IB may be admitted to Physics II with the consent of the Head of Department.

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. It is suggested that in addition to Topic CO this should include Topic B and one of the Topics D, F, and H.

Hours
3 lecture hours and 6 laboratory hours per week.
Engineering students refer to Engineering Faculty Handbook.

Examination
Equivalent of 6 hours total examination.

Content
Mechanics
Thermal Physics
Quantum Physics
Electromagnetics
Physical Optics

Texts
Refer to the Physics Department notice board.

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, F, and H.

Hours
Approximately 120 lecture hours and 240 laboratory and tutorial hours.

Examination
Assessment to the equivalent of 12½ hours of examination time.

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

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

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

C. 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.

743200 Physics IIIIB
This subject will not be offered in 1986.

Corequisite
Physics IIIA

Hours
90 lectures, 180 hours laboratory total, and two Mathematics topics.

Examination
Two 2½-hour papers and assessment. The mathematics topics will be examined by the Department of Mathematics.

Content
The subject emphasizes the experimental and applied aspects of Physics. The Department considers it desirable that some mathematical studies should be continued through this level, so two mathematics topics are included in Physics IIIIB, to be selected in consultation with the Physics Department.

The Physics lecture course will treat the following topics:
Experimental Techniques
Photometry and Instrumental Optics
Nuclear Measurements
Radio-frequency Spectroscopy
Electronics
Geophysics
Statistical Mechanics
Solid State Physics
Physics of Fluids

744100 Physics IV

Prerequisite
Physics IIIA. Attention is drawn to degree requirements for Honours, p.18.

Hours
100-120 lecture hours and a research project.

Examination
Assessment on each topic in the lecture course will be by agreement between the lecturer and students. It may take the form of formal examinations, essays, problems, open-book examinations etc. As a guide, for each ten lectures in a topic there will be a 1½ to 2 hour formal examination, or equivalent. The research project is also assessed on the basis of the written report and a seminar on the project.

Content
Physics IV is intended to give students an advanced understanding of the fundamentals of modern physics appropriate for an Honours graduate in the discipline as well as an exposure to the current interests of the Department viz. solid state and surface physics, geophysics, electromagnetic signal propagation, and aspects of applied physics.
In 1986, these aims will be achieved by offering topics from the following list: Quantum Mechanics, Relativity, Statistical Physics, Plasma Physics, Applied Nuclear Physics, Surface Physics, Atomic Collisions in Solids, Radio Astronomy, Fast Atomic Processes, Fourier Transforms. Additional topics may be added depending on visitors to the Department and all topics need not necessarily be offered in any one year.

Research Project

The research project is carried out under the supervision of a staff member and results are embodied in a formal report. The Department generally provides to prospective students a short list of research projects carefully chosen for suitability as Physics IV projects, and for relevance to research within the Department. The choice is not necessarily confined to this list. Students should consult with staff members on choice of project topic. Project work is to be started in the first week of February.

Texts

Texts and literature references will be given as needed by the lecturers concerned.

664300 Physics/Mathematics IV

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Physics IIIA &amp; Mathematics IIIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td>To be advised and, in addition, a research project of mathematical and physical significance jointly supervised.</td>
</tr>
<tr>
<td>Examination</td>
<td>Assessment will be in the appropriate Physics IV and Mathematics IV topics selected. In addition the research project will be assessed on the basis of a written report and a seminar on the project.</td>
</tr>
<tr>
<td>Content</td>
<td>Four topics from Mathematics IV chosen for relevance to Physics, and topics from Physics IV, as approved by the Head, Department of Physics. Project work will normally begin in the first week of February.</td>
</tr>
</tbody>
</table>

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.

751100 Psychology I

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Nil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td>3 lecture hours and one 2-hour practical/tutorial session</td>
</tr>
<tr>
<td>Examination</td>
<td>One 3-hour paper and an assessment of practical work</td>
</tr>
</tbody>
</table>

752100 Psychology II A

<table>
<thead>
<tr>
<th>Prerequisite</th>
<th>Psychology I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td>3 lecture hours, one 2-hour practical session and one hour tutorial per week</td>
</tr>
<tr>
<td>Examination</td>
<td>Two 3-hour papers and an assessment of practical work</td>
</tr>
</tbody>
</table>

752200 Psychology II B

<table>
<thead>
<tr>
<th>Prerequisite</th>
<th>Psychology I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corequisite</td>
<td>Psychology IIA</td>
</tr>
<tr>
<td>Hours</td>
<td>3 lecture hours, one 2-hour practical session and 1 tutorial hour per week</td>
</tr>
<tr>
<td>Examination</td>
<td>Two 3-hour papers and an assessment of practical work</td>
</tr>
</tbody>
</table>

753100 Psychology III A

<table>
<thead>
<tr>
<th>Prerequisite</th>
<th>Psychology IIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td>4 lecture hours and up to 5 hours practical work per week</td>
</tr>
<tr>
<td>Examination</td>
<td>Two 3-hour papers and an assessment of practical work</td>
</tr>
</tbody>
</table>
Content
Will examine topics such as Methodology and Quantitative Psychology, Information Processing and Perception, Behavioural Neurosciences, Learning and Conditioning, Social and Developmental Psychology and Individual Differences. Statistical methods will be taught and tested during the year.

The practical work is divided into
(a) Laboratory sessions — 3 hours per week.
(b) An investigation carried out under supervision. The topic of this will usually be selected by the student, although some restrictions may be decided by the Department — 2 hours per week.

Texts
753200 Psychology IIIB
Prerequisite
Psychology IIIB
Corequisite
Psychology IIIA
Hours
4 lecture hours and approximately 5 hours practical work per week
Examination
Two 3-hour papers and an assessment of practical work

Content
Will examine topics which complement and/or are supplementary to Psychology IIIA. Such topics may include Developmental Psychology and Psychobiology, Neurosciences, Social Psychology, Quantitative Methods, Personality, Abnormal and Clinical Psychology, Self Awareness and Interpersonal Skills, Computer Applications. Practical work comprises workshop and laboratory work for up to 3 hours per week plus a supervised independent experimental project.

Texts
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 IIIA or IIIB, as well as a Pass at any level in both Psychology II A and II B, 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, animal behaviour, developmental psychology, learning and cognition, motivation, perception, personality, physiological psychology, quantitative psychology, and social psychology.

Texts
754300 Psychology IVP
Prerequisites
9 subjects passed towards the degree of Bachelor of Science (Psychology), including Psychology IIIA.
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
664200 Psychology/Mathematics IV
Prerequisites
Mathematics IIIA & Psychology IIIC
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
56
57
Content
An introduction to the application of stochastic process models to the analysis of psychological processes involved in human information processing. Use of a real-time computer.

Text
Nil

References
To be advised

Master of Psychology (Clinical)
The course leading to the degree of Master of Psychology (Clinical) is offered in the Faculty of Science.

Prerequisites
Honours degree in Psychology or other qualifications approved by the Faculty Board of the Faculty of Science. It is considered highly desirable, if not essential, that candidates for this degree be concurrently employed in a position related to the practice of Clinical Psychology.

Hours
The course is a part-time course extending over 2 years. There are 9 hours of classwork per week plus a clinical internship organised either as two full days per week or an equivalent period of time in longer blocks.

Examination
Assessment is continuous and is achieved by:
1. Evaluation of practical performance by academic and field supervisors.
2. Evaluation of written or other exercises required in specific course components.
3. Evaluation of case presentation with vivo voce defence to an interrogation panel.
4. Internal and external examination of research thesis.

Content
There are three major sections of the course:
(i) Classwork includes both didactic and practical components and covers topics such as: Professional Practice and Forensic Psychology; Psychopathology; Psychological Assessment and Clinical Decision Making; Therapy; Preventative Psychology; Programme Development; Clinical Child Psychology; Psychotropic Drugs.
(ii) Clinical internship provides 2 days per week (or equivalent blocks) supervised clinical experience in professional settings outside that of the candidates' regular employment. It is intended to augment and consolidate instruction provided in classwork. A wide range of institutions and agencies are available for internship placements.
(iii) A Research Thesis is required embodying the results of a research investigation in an approved area.

Master of Psychology (Educational)
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.

Prerequisites
Nil

Hours
18 formal hours and 6 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. Workshops concentrating on the development of diagnostic skills and methods of psychological testing and assessment. Further activities include case study skills, consulting, communication and report writing, counselling procedures and personal development. Approximately equal time is devoted to seminar and workshop activities and thesis supervision continues throughout the year.

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
4 hours of lectures

Examination
To be advised

Content
The course provides an introduction to Geography. It consists of four strands all of which are continued in later years and each of which receives the same weighting in hours of lectures and in the final assessment.

Australian environments Introduction to the geography of Australia.

Human geography Introduction to human geography with particular reference to settlement and cultural geography.

Methods Introduction to methodological procedures used in geography.

Physical geography Introduction to physical geography with particular reference to climatology, hydrology, and biogeography.

Texts
Haggett, P. Geography; a modern synthesis latest paperback edn (Harper & Row)
**352100 Geography II A: Human Geography**

**Prerequisite**
Geography I

**Hours**
5 hours per week of lectures, practicals and tutorials, and one hour per week of Methods*; and up to 6 days of fieldwork. *(Note: Students also enrolled in Geography II B must undertake both Methods and *Environmental Issues in Australia*).*

**Examination**
To be advised

**Content**
A continuation of the study of human activities within the context of space and time which were introduced in Geography I. Because of uncertainties regarding the staff who will be available in 1986, the details of the course have not been determined. A statement setting out the course will be available early in January 1986 and may be obtained from the Faculty Secretary or the Department of Geography.

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**352200 Geography II B**

**Prerequisite**
Geography I

**Hours**
5 hours of lectures/practicals/tutorials and one hour of Methods* per week; and up to 6 days of fieldwork. *(Note: Students also enrolled in Geography II A must count Methods in II A only, and count the alternative strand, *Environmental Issues in Australia* in II B only.*

**Examination**
To be advised

**Content**
A study of the physical environment. In 1986 themes will be established around the following specific fields of interest:

- **Geomorphology** (Dr R. J. Loughran): An introduction to the study of landforms, weathering, soils, mass movement, river processes, landmarks of arid and cold climate zones, and coastal geomorphology.

- **Climatology** (Dr H. A. Bridgman, Dr G. N. McIntyre). An introduction to the study on a synoptic and meso-climate scale including radiation and heat budgets; thermodynamics; precipitation processes; climates of the world; climatic change; agricultural climatology; applied climatology.

- **Biogeography** (Dr J. C. Turner). An introduction to biogeography. Definitions and scope of the subject will be examined and its inter-disciplinary nature emphasized. Ways of describing and analysing the geographical ranges of organisms will be explored.

**Texts**
- Attenborough, D. Life on earth (Fontana paperback, 1981)

* Strands common to Geography II A and II B

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(a) **Methods** (to be taken by all students) — 1 hour per week
Further development of geographical techniques: introduction to computer-aided mapping and geographical analysis. No previous experience with computers is assumed.

**Text**
Nil

(b) **Environmental issues in Australia** (to be taken only by those students taking both II A and II B) — 1 hour per week.
The aim of this strand is to acquaint students with some of the major issues related to the Australian environment. The issues, while based on the fundamental characteristics of climate, landforms, soils, vegetation, hydrology, coasts and other physical phenomena, also have a significant human element. Thus the study, by focusing on the linkages between man and his environment through particular cases, emphasises the links which exist between the two broad fields of physical and human geography.

Issues to be dealt with include: the environmental impact of pastoralism, agriculture and mining; the incidence and effects of soil degradation; droughts, floods and other natural hazards; the problems of population distribution.

**Text**
Nil

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**353100 Geography III A - Human Geography**

**Prerequisite**
Geography II A

**Hours**
Five hours of lectures/practicals/tutorials, and one hour of Methods* per week; and up to 6 days of fieldwork. *(Note: Students also enrolled in Geography II B must undertake both Methods and *Environmental Issues in Australia*).*

**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 II A. Because of uncertainties regarding the staff who will be available in 1986, the details of the course have not been determined. A statement setting out the course will be available early in January 1986 and may be obtained from the Faculty Secretary or the Department of Geography.

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**353200 Geography III B - Physical Geography**

**Prerequisite**
Geography II B

**Hours**
Five hours of lectures/practicals/tutorials, and one hour of Methods* per week; and up to 6 days of fieldwork. *(Note: Students also enrolled in Geography III A must undertake both Methods and *Environmental Issues in Australia*).*

**Examination**
To be advised
Content
A continuation of the study of the physical environment. In 1986 themes will be established around the following specific fields of interest.

Biogeography (Dr J. C. Turner) A continuation of the study of Biogeography, emphasizing the botanical side of the subject which is seen as part of the broader field of Ecology. As well as the exploration of the major themes of Kellman's book (see Texts below), attention is paid to (i) Australian vegetation and its history; (ii) rainforest; and (iii) case studies of field research on Australian plants and animals.

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

Drainage Basin Hydrology (Dr R. J. Loughran) Precipitation, runoff, soil erosion, and sediment and solute transport within the context of the drainage basin system.

Texts

* Strands common to Geography IIIA and IIIB

(a) Methods (to be taken by all students) - 1 hour per week
This is a continuation of the Methods programme taken in Geography II. Further development of principles and practice in computer-aided mapping and graphics; an introduction to non-parametric statistics and multivariate methods used in geography. The emphasis is upon the use and interpretation, rather than the theory, of statistics.

Texts Nil

(b) Environmental issues in Australia (to be taken only by those students enrolled in both Geography IIIA and IIIB) - 1 hour per week
This is a continuation of the strand which was commenced in Geography II. It includes the study of the Australian arid zone and of the conservation of Australia's environments and cultural heritage.

Texts Nil

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
Part I Topics

Algebra

Text
Anton, H. Elementary Linear Algebra 2nd edn (Wiley 1977)

References
Brisley, W. A Basis for Linear Algebra (Wiley 1973)
Kolman, B. Elementary Linear Algebra (Macmillan 1977)
Liebeck, H. Algebra for Scientists and Engineers (Wiley 1971)
Lipschutz, S. Linear Algebra (Schaum 1968)

Real Analysis

Text
Nil

References
Apostol, T. Calculus Vol. 1 2nd edn (Blaisdell 1967)
Giles, J. R. Real Analysis an Introductory Course (Wiley 1972)
Spivak, M. Calculus (Benjamin 1967)

Calculus

Text
Nil

References
Ayres, F. Calculus (Schaum 1974)

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 Statistical Tables

References
Students intending to pursue computing studies should also obtain one of the following references for Pascal.

References for Pascal
Cooper, D. & Clancy, M. Oh! Pascal (W. W. Norton & Co. 2nd edn 1982)

Other References
Hoel, P. G. Introduction to Mathematical Statistics (Wiley 1971)

661400 Computer Science I

Corequisite
Mathematics I

Hours
3 lecture hours and 3 laboratory hours per week.

Examination
Two 3-hour papers

Content
Introduction to the following aspects of computer science: The design of algorithms. The theory of algorithms. How algorithms are executed as programs by a computer. The functions of system software (compilers and operating systems). Applications of computers. Social issues raised by computers. An extensive introduction to programming in Pascal.

Texis
Goldschlager, L. & Lister, A. Computer Science, A Modern Introduction (Prentice-Hall 1982) and either
Cooper, D. & Clancy, M. Oh! Pascal (W. W. Norton & Co. 2nd edn 1982)
or

References
Nil
Part II Subjects

The Department offers three Part II Mathematics subjects and Computer Science II. Students whose course restricts them to one such subject must study Mathematics IIA or Mathematics IIB or Computer Science II. The subject Mathematics IIA is a pre- or corequisite for Mathematics IIC, and IIA and IIC together a prerequisite for any Part III subject, so students wishing to take two Part II subjects would normally choose Mathematics IIA and IIC.

When selecting topics for Part II subjects, students are advised to consider the prerequisites needed for the various Part III subjects offered by the Department of Mathematics (Mathematics IIIA, Mathematics IIIB and Statistics III). 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 Mathematical Models</td>
<td>CO</td>
<td></td>
</tr>
<tr>
<td>B Complex Analysis</td>
<td>CO</td>
<td></td>
</tr>
<tr>
<td>CO Vector Calculus &amp; Differential Equations (Double topic)</td>
<td></td>
<td>M, N, P, PD, Q, QRS, R, TC, Y, Z</td>
</tr>
<tr>
<td>D Linear Algebra</td>
<td>CO</td>
<td></td>
</tr>
<tr>
<td>E Topic in Applied Mathematics e.g. Mechanics, Potential Theory and Fluid Dynamics</td>
<td></td>
<td>P, T, U, X, Z</td>
</tr>
<tr>
<td>F Numerical Analysis &amp; Computing</td>
<td></td>
<td>TC</td>
</tr>
<tr>
<td>H Applied Statistics</td>
<td></td>
<td>SS, U</td>
</tr>
<tr>
<td>I Probability and Statistics</td>
<td></td>
<td>R, SS, U, Y</td>
</tr>
<tr>
<td>K Topic in Pure Mathematics e.g. Group Theory</td>
<td></td>
<td>O, T, X</td>
</tr>
<tr>
<td>L Analysis of Metric Spaces</td>
<td></td>
<td>FM, O, P, V, W</td>
</tr>
<tr>
<td>ML Introduction to Computer Architecture and Assembly Language</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI Introduction to Structuring of Information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP Systematic Programming</td>
<td></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.

The selection rules and definitions of the Part II subjects follow.

**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, one other topic may be substituted for B. Additional substitutions may be allowed in the case of candidates who have passed the subject Mathematics IIB.

**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 L, where CO counts as two topics, and approved by the Head of Department. In exceptional circumstances, and with the consent of the Head of Department one or more of the topics SP, K or L may be included.

**662300 Mathematics IIC**

**Prerequisite** Mathematics I

**Pre- or Corequisite** Mathematics IIB

**Hours** 4 lecture hours and 2 tutorial hours per week

**Examination** Each topic is examined separately

**Content**

The topics H, I, K, L, or A, H, K, L or A, E, K, L or I, F, K, L or I, A, K, L. Students who may wish to proceed to Statistics III as a Part III subject should select H, I, K, L. In exceptional circumstances, and with the consent of the Head of the Department, some substitution may be allowed.

**662400 Computer Science II**

**Prerequisite** Mathematics I

**Hours** 168 hours of lectures, tutorials and practical work as listed below

**Examination** See component descriptions below

**Content**

Topics SI — Introduction to Structuring of Information

SP — Systematic Programming

ML — Introduction to Computer Architecture and Assembly Language

F — Numerical Analysis and Computing

**Notes**

1. Mathematics IIB is no longer offered in two parts in the Faculty of Science. Students who passed Mathematics IIB part (i) before 1971 should consult Note I on page 90 of the 1971 handbook.

2. Mathematics IIA is a corequisite or prerequisite for Mathematics IIC.

3. Students whose course includes Physics IIIA are advised to include topics CO, B and one of D, F and H in their Part II Mathematics subject/subjects. This may require the use of the substitution rules.
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 IIIA. 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 avoid taking topics R, U and Y as Mathematics IIIA topics. 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>Specific Topics</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>K, L</td>
</tr>
<tr>
<td>P</td>
<td>Ordinary Differential Equations</td>
<td>CO, D, L</td>
</tr>
<tr>
<td>PD</td>
<td>Partial Differential Equations</td>
<td>CO</td>
</tr>
<tr>
<td>PL</td>
<td>Programming Languages and Systems</td>
<td>CO</td>
</tr>
<tr>
<td>Q</td>
<td>Fluid Mechanics</td>
<td>CO</td>
</tr>
<tr>
<td>QS</td>
<td>Quantum, and Statistical Mechanics</td>
<td>CO</td>
</tr>
<tr>
<td>R</td>
<td>Theory of Statistics</td>
<td>CO, I</td>
</tr>
<tr>
<td>S</td>
<td>Geometry</td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>Survey Sampling Methods</td>
<td>H, I</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, F</td>
</tr>
<tr>
<td>U</td>
<td>Regression, Design and Analysis of Experiments</td>
<td>D, H, I</td>
</tr>
<tr>
<td>V</td>
<td>Measure Theory and Integration</td>
<td>L</td>
</tr>
<tr>
<td>W</td>
<td>Functional Analysis (not offered in 1986)</td>
<td>I</td>
</tr>
<tr>
<td>X</td>
<td>Rings and Fields</td>
<td>D, K</td>
</tr>
<tr>
<td>Y</td>
<td>Stochastic Processes</td>
<td>CO, H, I</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.

663100 Mathematics IIIA

Prerequisites Mathematics IIA & IIC

Hours 4 lecture hours and 2 tutorial hours per week

Examination Each topic is examined separately

Content

A subject comprising Topic O, together with three other topics, at least one of which should be from the set (M, N, Q, QS, SS, U, R), and at least one from the set (S, X, T, V, P). The final choice of topics must be approved by the Head of the Department. The topic PL will not normally be included in this subject.
RESEARCH IN THE FACULTY OF SCIENCE
DEPARTMENT OF BIOLOGICAL SCIENCES

Current experiments in the field of mammalian reproduction involve studies of the mechanism by which alcohol abuse leads to birth defects. Elucidation of the nature of embryonic stimuli responsible for the establishment of pregnancy is also under investigation. The biology of spermatozoa and comparative structure and function of the vertebrate epididymis. Within the field of immunological influences on fertility, the following topics are currently under investigation: the detection of antispermatozoal antibodies in sera from infertile and vasectomized men; the isolation and characterization of human spermatozoal auto- and iso-antigens; early pregnancy factor. In a study on a hypothesis on the initiation of cancer, histones HI are being compared in chromatin from normal and malignant cells.

Investigation into infertility in humans resulting from auto- and isoimmunity to spermatozoa. The study of non-immunological spermagglutinins in human sera. The preservation by freezing of human spermatozoa for artificial insemination. The ecology and genetics of populations, geographic variation and hybrid zones in Lepidoptera are currently being studied. Research in carbon partitioning within plants is focused on elucidating the cellular pathway and mechanisms of phloem unloading together with assessing the regulatory role served by phytohormones. In the area of chloroplast development and chloroplast DNA in plant cells, research is being carried out into the organisation of chloroplast DNA in chloroplasts and chloroplast genetic modification using cell culture and cell fusion.

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)
Trace analysis studies; sorption, and selective extraction, of heavy metal ions by (or from) soil components; metal-organic acid complexes; heterogeneous oxidation mechanisms.

Analytical Chemistry; Wine Science (Dr G. L. Orr)
Instrumental 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.

Molecular Spectroscopy (Associate Professor R. P. Cooney)
Laser Raman, Fourier-transform infrared spectroscopy and electronmicroscopy applied to metal complexes, molecules adsorbed on oxide surfaces of catalytic interest, species at metal electrode surfaces, polymers, and surfactants.

DEPARTMENT OF CHEMISTRY

Organic Reaction Mechanism (Associate Professor L. K. Dyall)
Studies on the mechanisms of pyrolytic reactions; reactions of nitrene.

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**
Carboniferous palaeoecological 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 bryozoans and brachiopods. (Associate Professor B. A. Engel)

**Coalfield Geology**
Coal formation and sedimentology of associated clastic sediments. Coal petrology, reflection 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. (Associate Professor C. F. K. Diesel)

**Coal and Oil Shale Mineralogy**
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. (Associate Professor S. S. L. Warne)

**Economic Geology**
Ore genesis with a special emphasis on the geochemistry of hydrothermal fluids in the ore-forming process. Sulphur isotope, fluid inclusion and mineralogical studies of precious metal vein deposits, magnatic nickel-copper ores and stratiform base metal sulphide mineralisation. Metallurgy of the Lachlan and New England Fold Belts, New South Wales; and wall rock alteration patterns around base metal deposits. (Dr R. Offer)

**Metamorphic Petrology**
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. (Dr R. Offer)

**Igneous Petrology**
 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-plutonitic dykes and mafic inclusions, California, USA. (Dr D. R. Mason)

**Structural Geology**
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. (Associate Professor K. H. R. Moelle)

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

**Geology of the Hunter Valley**
Detailed geology, including stratigraphy, structural geology, petrology, sedimentology, palaeontology and palaeocology. (All staff)

** department may be divided into two main areas — the physics of the surfaces of solids (surface physics) and the physics of the earth and near earth region (geophysics). In addition, there are special interest topics of individual staff members. A brief description of these topics is set out below.

**Surface Physics — Ion-Surface Interaction** (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 studies of the structure 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 — Electron-surface Interaction** (Associate Professor J. A. Ramsey, Mr R. H. Roberts, Dr P. V. Smith, Mr J. E. Cleavey)
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 X-ray photoelectron spectroscopy is directed towards the study of the structure and composition of clean metal surfaces and the adsorption of other species thereof. 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 — Geomagnetic Pulsaions** (Associate Professor B. J. Fraser, Dr F. W. Menk)
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 seven 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. Sophisticated digital time series analysis techniques are employed and microprocessor recording and analysis systems are under development.

**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 radio relay link. Digital Techniques employing ganged high speed micro-computers have been developed to allow signal processing to be carried out in real time.

**Geophysics — Fireball Studies** (Associate Professor C. S. L. Keay)
Investigations of anomalous phenomena connected with the atmospheric entry of very large meteor fireballs is continuing with laboratory studies of some of the mechanisms involved, particularly low frequency electromagnetic production of acoustic waves.

**Theoretical Solid State Physics** (Dr P. V. Smith)
Investigations in theoretical solid state physics involve the application of semi-empirical techniques incorporating total-

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**DEPARTMENT OF PHYSICS**

**Geophysics**

- Mr J. E. Cleary)
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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 simplification of solutions to some microwave instrumentation problems.

Medical Physics Related to Vision
Work is continuing on a joint project with the department of Psychology involving studies and characterisation of kinematic stereopsis.

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.

Cognitive Processes
Research into the development of cognitive processes has continued with particular emphasis on factors associated with the acquisition of concepts. Several research programmes are being pursued.

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. 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.

DEPARTMENT OF GEOGRAPHY

Biogeography
Vegetation of the Hunter Valley with particular reference to rainforest ecology (J. C. Turner)

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)

Development Geography
Marketing of agricultural produce in Bandung Regency, West Java; demographic changes in a Malay village, Kedah, Malaysia (R. Barnard)

Development issues in Kedah, Malaysia (R. Barnard)

Environment Science
Development of a complete environmental monitoring programme for proposed open-cut and underground coal mines, including meteorological, air and water quality monitoring. (J. Symon)

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. Currently the industrial problem known as Repetitive Strain Injury provides a practical focus for the programme.

Physiological and Comparative Psychology
Physiological and biochemical systems involved in behaviour are being investigated with both human and infrahuman subjects. Central neurochemical and autonomic nervous system correlates of physiological stress are under investigation. Several programmes are being devised.

Development of a computerised management system for vineyards in the Hunter Valley. (J. Symon)

Geographical theory and philosophy
Explanation in Geography (Mary R. Hall)

Development of theory and applications in chronogeography and behaviour ecology (D. N. Parkes)

Development of a complete environmental monitoring programme for proposed open-cut and underground coal mines, including meteorological, air and water quality monitoring. (J. Symon)

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.
Algebra
Associate Professor W. Brisley is working on some problems in group theory which arise from graph theory and on general problems associated with symmetry.

Artificial Intelligence
Simon is working on aspects of Artificial Intelligence, with particular regard to computer processing of natural language.

Astrophysics
Dr W. P. Wood is investigating the structure and internal dynamics of the oblique rotator model of magnetic stars. The problem of magneto-acoustic waves in the atmosphere of Ap stars is also being studied.

Biostatistics
Associate Professor A. J. Dobson and R. W. Gibberd are interested in theoretical problems which arise from consulting in medical statistics. Current research includes: analysis of data with correlated errors, systems modelling, proportional hazards models, prognostic indicators.

Biocatalysis
Dr W. Summerfield is also studying fluid mechanical features of the cardiovascular circulatory system. He is interested in the mathematical modelling of all functions of the human body.

Computer Science and Numerical Analysis
Dr D. W. E. Blatt is working on computer graphics and modelling techniques. He is also working on models of programme referencing behaviour and studying performance of memory management systems, and on real-time computer techniques for protection and monitoring of high voltage switchyards. In addition, he is developing concurrent programming systems and techniques for writing software for multiprocessor systems. He is also interested in the development of programming languages and systems.

Dr B. Berghout is also working on VLSI systems, the development of software tools to aid their design and the analysis of algorithms which take advantage of the concurrent structures offered by VLSI.

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, operating systems, programming languages, compiler design, databases, computer networking, etc. Substantial practical work suitable for both honours and postgraduate projects in computer science is involved.

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

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

Environmental and Urban Studies
Dr R. W. Gibberd is studying the art of population projections and various models of urban structure and urban development.

Associate Professor R. J. Vaughan is investigating mathematical models in urban geography.

Epidemiology
Associate Professors A. J. Dobson and 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 ischaemic heart disease incidence, case-fatality and mortality rates, risk factors and medical treatment; use of hospital separation data for epidemiological research; spatial behaviour of hospital patients in the Hunter Region; 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.

Dr W. T. F. Lau is concerned with viscous flow problems, particularly those involving free boundaries.

Dr W. Summerfield is interested in all phenomena in which fluid dynamics plays a significant role; for example, ocean waves, turbulence, estuarine-dynamics, weather prediction, sailing vessels, surfing, animal propulsion.

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 developing theory of differentiation of locally Lipschitz functions with a view to applying it to several geometrical problems in Banach spaces.

Mr V. Ficker and Dr C. J. Ashman are working in measure theory, particularly in some problems of families of sets.

History of Mathematics
Mr R. F. Berghout is pursuing research into the development of algebra, notably modern algebra, as well as the relations between this and classical occidental and oriental algebra.

Mr Berghout is also working on Greek mathematics and architecture.

Integral Geometry
Dr R. B. Eggleton studies decomposition of squares into triangles with integer side lengths, and the fine structure of lattice point distributions inside circles.

Dr T. K. Sheng studies functions of distances between random points in convex and non-convex regions in Euclidean n-space.

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

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.

Dr T. K. Sheng studies the application of dispersive and explosive linear operators, distribution of algebraic numbers in the complex plane, and functions defined on rational numbers. Lines determined by lattice points and application of the results obtained to statistical mechanics are studied. Convexity indices and their applications to transport networks, etc.

Protein Structure
Associate Professor C. A. Croxton is working on structural techniques being applied to the prediction of the three-dimensional structure of globular proteins, and to the folding pathways by means of which these folded structures are achieved from the primary amino acid sequence.
Associate Professor C. A. Croxton is also applying Monte Carlo techniques to the prediction of transfer RNA structures and their subsequent folding.

Statistical Mechanics
Associate Professor C. A. Croxton is working on the statistical mechanics of liquids, polymers and liquid interfaces.

Professor A. J. Guttmann is working on the theory of equilibrium critical phenomena. He is particularly interested in the analysis of power series expansions which are frequently used to study systems exhibiting phase transitions.

Professor A. J. Guttmann is using renormalisation group and series analysis methods to study the critical behaviour of systems with free surfaces.

Transportation Problems
Associate Professor R. J. Vaughan is continuing his work on the application of mathematics to traffic engineering, traffic accidents and transportation planning.

Subject Computer Numbers for the Bachelor Degree Courses
The subjects selected should be written on the enrolment form in the following manner.

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(Not offered in 1986)

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Mathematics IIA
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