FACULTY OF SCIENCE
HANDBOOK

CALENDAR
1982

Volume 10
FOREWORD

It gives me great pleasure to welcome you back, or into, the Faculty of Science for this year. I trust that the year will be both profitable and enjoyable for you. Undoubtedly you will hear many people indicate that you will have the opportunity of getting as much from the year as you want, and that what you get from the year will be related to how much effort you put into it. Both of these comments are undoubtedly true. Within the Faculty of Science we trust that you will be well prepared during your time here for the years ahead.

The motto of the University "Look ahead" has been chosen with some thought. We look ahead to our graduates making important contributions to Newcastle and the Hunter Region, to Australia and to the world in the future — perhaps in another ten or fifteen years. Our aim is to produce graduates who can simply and capably fill an existing position in industry, education or research. Our aim is to turn out graduates who can go into positions, fill them capably, but then create and bring about developments which will lead to progress. In short, we aim to turn out the leaders who will bring about the necessary developments for the future. For these reasons, understanding and ability to handle principles is fundamentally important.

There is opportunity in the university to learn and to develop. You will learn quite a deal and you will develop quite a deal if you follow the work that is given to you during instructional periods. However, you will learn and develop more if you follow up this work by consulting extra resources such as those available to you within the Library. Consequently, you are encouraged to keep abreast of the instruction you are given but you are also urged to follow up the topics which interest you, or perhaps pose problems to you, by undertaking your own activity outside of class hours. The Board of this Faculty offers you the advice that, unless you devote at least 50 hours per week in each year of your degree programme, you will not be giving yourself appropriate opportunity to pass all of your subjects in a particular year.

As well as a pleasant site, this University offers a very great advantage — small numbers and small class sizes. In this way it becomes possible for staff and students to know each other and to have much more effective interplay than in a larger institution. Many staff members have chosen to take up positions here at Newcastle because of this important opportunity. You should be willing to make use of the opportunity of talking directly to staff members and asking questions, as well as seeking additional information. Be prepared to visit staff members outside of class hours. We were all students once and know only too well how reluctant we felt to approach staff members. But, I assure you, we were very similar to you and appreciate the situation that students feel themselves in. There is always someone who can give you advice on any matter. All that is necessary is to approach any staff member who will then, quite certainly, either provide the advice or inform you of the source where you can get help. Be prepared to seek information and advice and I am sure that many of your difficulties will be easily resolved.

As well as indicating to you that you should try to get as much as possible from your association with the Faculty of Science, I also indicate that you should try to get as much as possible from your association with the University, in the broad sense, both on a social and recreational basis as well as educational. There are opportunities for all sorts of activities other than purely formal learning and work, and I am certain that your life will be richer if you avail yourselves of the broader activities of the University.

Again, I hope that you will have a successful and enjoyable year. I trust that you will put in the effort required to achieve success and the satisfaction to be derived from success. The satisfaction is knowing that you have shown marked development, and that this will be of benefit to you, and also the realization that this will be of benefit to our community in the coming years.

B. BOETTCHER
Dean of Science (1981)
FACULTY OF SCIENCE

The Faculty of Science comprises the Departments of Biological Sciences, Chemistry, Geology, Physics and Psychology. The Departments of Geography and Mathematics 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;
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.

"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, and
(h) exercise such other powers and duties as may from time to time be delegated to it by the Council."
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Sub-Dean
T. K. Roberts, BSc(Adelaide), PhD(Flinders)

Faculty Secretary

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Vacant

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K. R. Moeller, Abs, DrPhil(Imnsbruck), AAusIMM
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Lecturer
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Associate Professor
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J. W. Staines, BA, BE(Sydney), BEd(Melbourne), PhD(London), MBPS, FAPSS

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H. A. Bridgman, BA(Boise State College), MA(Hawaii), PhD(Wisconsin)
W. J. A. Jones, BA(New South Wales), MA, PhD(Papua New Guinea); DipEd(New South Wales)
G. N. McIntyre, BA(Tasmania), MA(Australian National), FRMetS

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A. J. Guttmann, MSc(Melbourne), PhD(New South Wales)
P. K. Smirn, PromPhys, CSc, RNDes(Chicago)
W. D. Wallis, BSc, PhD(Sydney)

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R. B. Egginton, BSc, MA(Melbourne), PhD(Calgary)
V. Flicker, PromMat, CSc, RNDs(Connuin)
R. W. Gibbard, BSc, PhD(Adelaide)
W. T. F. Lau, M(Engineering), BSc(Brunswick), MAIAA
D. L. S. McElvain, BSc(Queensland), PhD(York (Canada))
T. K. Sheng, BA(Marian College), BSc(Malaya & London), PhD(Malaya)
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J. G. Cooper, BSc, PhD(New England)
M. J. Hayes, BA(Cambridge)
W. C. Summerfield, BSc(Adelaide), PhD(Manitoba)
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C. J. Ashman, BA, Litt(St Andrews), DipCompSci
G. W. Southern, BA(New South Wales), DipCompSci

Honorary Associate
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Research Fellow
J. Reese, BSc, MSc(Canterbury), PhD(Alberta)

Computer Programmer
A. Nymeyer, BMath, DipCompSci

Administrative Assistant
Ros A. Mills

Departmental Office Staff
Cath Clayton
Jan Garmney
Julie H. Latimer
Information for Undergraduates

Students may choose subjects from the Departments of Geology, Physics, Chemistry, Biological Sciences, Psychology, Mathematics and Geography. A student may, with the permission of the Dean, count up to three subjects offered in other degree courses in the University as qualifying subjects.

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

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

Psychology

The Australian Psychological Society is the professional organisation of psychologists in this country.

The objects of the Society are the advancement and diffusion of a knowledge of psychology and especially the promotion of the professional standing of its members by setting up a high standard of training and conduct, and by requiring the observance of rules of professional conduct.

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

The University of Newcastle Psychology Students’ Association

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

"To provide regular opportunities for social contacts among Psychology students, and Psychology students and staff."

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

Subject Timetable Clashes

Students are strongly advised to check on possible timetable clashes before enrolling. Clashes may force students to take those subjects in different years. Although academic staff are always willing to advise students, it is the student's responsibility to ensure that chosen subjects may be studied concurrently. To help in this matter the following table of existing clashes has been compiled for Science Faculty subjects in 1982. 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>Biology IIA with</th>
<th>Geology IIA</th>
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<tr>
<td>Biology IIB with</td>
<td>Geology IIB</td>
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<tr>
<td>Chemistry IIB</td>
<td>Chemistry IIIB</td>
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<td>Geology IIB</td>
<td>Geology IIIA</td>
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**Chemistry**

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<th>Geology IIB</th>
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<tr>
<td>Chemistry IIB with</td>
<td>Biology IIB</td>
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<tr>
<td>Geology IIB</td>
<td>Biology IIIA</td>
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<tr>
<td>Geology IIA &amp; IIB</td>
<td>Geology IIIA</td>
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<tr>
<td>Physics IIIA</td>
<td>Chemistry IIIA</td>
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**Geology**

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<th>Chemistry IIB</th>
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<tr>
<td>Geology IIB with</td>
<td>Chemistry IIA</td>
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<tr>
<td>Geology IIIA with</td>
<td>Chemistry IIB</td>
</tr>
</tbody>
</table>
Geology III B with
Chemistry III A
Chemistry II A
Chemistry II B
Biology III A
Biology II A
Physics III A

Mathematics
Psychology II B
Mathematics III A
Psychology II B
Physics III A
Chemistry II B
Biology II B

Computer Science III with
(some topics only)
Physics III A
Physics III B

Physics II A with
Biology II B
Chemistry II B
Chemistry II B
Geology II B
Mathematics (some topics only)
Computer Science III (some topics only)

Psychology II B with
Mathematics II (some topics only)

Psychology II B with
Mathematics III (some topics only)

Psychology II B with
Mathematics III (some topics only)

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. Notwithstanding paragraphs 1 and 2, above, the Faculty Board may review the academic progress of a student in the later years of attendance.

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 Prerequisite 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 prescribed, some subjects are currently presented on the assumption that students have previously studied subjects and achieved results in them at the 30th percentile or above.

Subject
Physics I A — Mathematics (3-unit course) and Physics (2-unit course).
Physics I B — Physics (2-unit course) or Science (Multistrand).
Chemistry I — Chemistry (2-unit course), or Multistrand (4-unit)
Mathematics I — Mathematics (2-unit course).

Assumed Level

Student Advice
Students who have problems should feel free to seek the advice of the DEAN, SUB-DEAN, the appropriate HEAD OF DEPARTMENT OR MEMBER OF 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 (Not offered in 1982)

FORMAL ENROLMENT NOT NECESSARY

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 reading 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 Curriculum and Method Subjects offered in the Diploma in Education
Students who intend to proceed to a Diploma in Education should familiarise themselves with the prerequisites for curriculum and method subjects offered in the Diploma Course. These prerequisites are stated in terms of subjects of the University of Newcastle. Applicants with qualifications from other universities, or in 1981 or 1982 from this University, whose courses of study have included subjects which are deemed for this purpose to provide an equivalent foundation, may be admitted by the Dean on the recommendation of the Head of the Department of Education.

In the Diploma course the Curriculum and Method units, now known as Group C, are grouped as follows:

- Humanities (English, History)
- Geography and Social Science
  (Geography, Commerce, Social Science)
- Mathematics and Science
- Languages (French, German)
- Primary
Prerequisites
For secondary methods a Part III subject in the main teaching area and a Part II subject in another teaching area.
For primary method a Part III subject in at least one teaching area, or a Part III subject in Psychology or Education together with a Part II subject in a 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. Examinations
The examination of candidates for the degree shall be carried out in accordance with the Examination Regulations approved by the Council from time to time.

5. 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 sixth Monday in second term shall be deemed to have failed in the subject save that, after consulting with the Head of Department, the Dean may grant permission for withdrawal without penalty.

6. 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.

7. 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.

8. Unsatisfactory Progress
The Regulations Governing Unsatisfactory Progress shall apply where a candidate fails to maintain a rate of progress considered satisfactory in a subject of the course.

9. 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

10. Admission to Candidature
Admission to candidature shall be governed by the Regulations Governing Admission and Enrolment made by the Council from time to time.

11. 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:
   (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; and
   (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.

12. 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.

13. 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.

14. Choice of Subjects
(1) The nine subjects presented for the degree shall include:
   (a) not fewer than six subjects selected from the Schedule of Subjects to these Regulations;
   (b) at least three of the following: Biology I, Chemistry I, Geography I, Geology I, Mathematics I, Physics I A or Physics I B, and Psychology I;
   (c) (i) at least one Part III subject and two Part II subjects from the Schedule of Subjects to these Regulations; or
      (ii) at least two Part III subjects and one Part II subject from the Schedule of Subjects to these Regulations.
(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 four subjects listed in Schedule A to the Regulations relating to the degree of Bachelor of Mathematics;
(c) more than five subjects from any one Department;
(d) Psychology IIIC if either Psychology IIAB or Psychology IIIB is included;
(e) Geology IIIC if either Geology IIIA or Geology IIIB is included;
(f) Psychology IIIC if either Psychology IIA or Psychology IIIB 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.

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

<table>
<thead>
<tr>
<th>Part I subjects</th>
<th>Part II subjects</th>
<th>Part III subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>(b)</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>(c)</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

OR
(d) in exceptional circumstances, with the permission of the Dean

| 4 | 4 | 1 |

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

THE HONOURS DEGREE

17. Admission to Candidature
In order to be admitted to candidacy 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.

18. 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

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

20. 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
- or
- Psychology/Mathematics IV.

Subject offered in the Faculty of Mathematics

21. Regulations 17 and 19 of these Regulations shall apply to a combined honours degree. The references in Regulation 17 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

22. 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.

23. 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.

24. 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.

25. 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.

26. 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 other than those prescribed in Clause 12 and all the requirements for the degree of Bachelor of Science other than those prescribed in Regulations 13 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 of Bachelor of Arts;
(b) at least six subjects, including at least one Part III subject and one Part II subject in a different department, shall be chosen from the Schedule of Subjects approved for the degree of Bachelor of Science, the Part III subject selected to be from a department other than that offering the Part III subject mentioned in (a); and
(c) the maximum total number of Arts Part I subjects and Science Part I subjects shall not exceed six.

27. Science/Mathematics
(1) A candidate shall qualify for admission to the ordinary degrees of Bachelor of Science and Bachelor of Mathematics by passing fourteen subjects, as follows:
(a) five subjects, being Mathematics I, Mathematics II A, Mathematics II C, Mathematics III A and another Part II subject chosen from the Schedule of Subjects approved for the degree of Bachelor of Mathematics; and
(b) six subjects chosen from the other subjects listed in the Schedule of Subjects approved for the degree of Bachelor of Science; and
(c) three subjects chosen, with the approval of the Deans of the Faculties of Mathematics and Science, from the subjects approved for any of the degree courses offered by the University.

(2) The following restrictions shall apply to a candidate’s choice of subjects, namely:
(a) the number of Part I subjects shall not exceed six;
(b) the minimum number of Part III subjects shall be three;

c) a candidate counting Psychology IIC shall not be entitled to count either Psychology IIA or Psychology IIB;

d) a candidate counting Psychology IIC shall not be entitled to count either Psychology IIA or Psychology IIB;

e) a candidate counting Economics IIC shall not be entitled to count either Economics IIA or Economics IIB;

(f) a candidate counting Geology IIC shall not be entitled to count either Geology IIA or Geology IIB.

28. **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**

**PART I**

| Subject             | Remarks, Prerequisites, Corequisites, Preparatory Subjects
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology I</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Chemistry I</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Geography I</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Geology I</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Mathematics I</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Physics IA</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Physics IB</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Psychology I</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
</tbody>
</table>

Only one of these subjects may be taken.

**PART II**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Remarks, Prerequisites, Corequisites, Preparatory Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology IIA</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Biology IIB</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Chemistry IIA</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Chemistry IIB</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Computer Science II</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Electronics &amp; Instrumentation II</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
</tbody>
</table>

Prerequisite: Biology I

Corequisite: Chemistry I

Preparatory Subjects:

Mathematics I & other Physics IA or Physics IB

Prerequisite: Chemistry I

Corequisite: Chemistry IIA (Advisory)

Prerequisite: Mathematics I

Corequisite: Physics IA or IB

Corequisite: a Part III subject approved by the Faculty Board on the recommendation of the Head of the Dept. of Physics.

**PART III**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Remarks, Prerequisites, Corequisites, Preparatory Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology IIA</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Biology IIB</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Chemistry IIA</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Chemistry IIB</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Geography IIA</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
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<tr>
<td>Geography IIB</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Geology IIA</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
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<tr>
<td>Geology IIB</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Mathematics IIA</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
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<tr>
<td>Mathematics IIB</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
<tr>
<td>Mathematics IIC</td>
<td>Remarks, Prerequisites, Corequisites, Preparatory Subjects</td>
</tr>
</tbody>
</table>

Physics IIA

Prerequisite: Biology IIA

Corequisite: Chemistry IIA

Preparatory Subjects:

Mathematics IIA and Mathematics IIC

Prerequisite: Physics IIA, and at least one Part II Mathematics subject which shall include, in addition to Topic CO (which counts as two topics), Topic B and one of the Topics D, F and H.

Physics IIB

Prerequisite: Physics IIB

Corequisite: Physics IIA

This subject will not be offered in any one year unless there are three or more enrolments.

Psychology IIA

Prerequisite: Psychology IIA

Psychology IIB

Prerequisite: Psychology IIB

Statistics III

Prerequisite: Mathematics IIA and Mathematics IIC (including topics CO, D, H and I).

**POSTGRADUATE COURSES**

Studies may be undertaken for the following postgraduate qualifications:

- Diploma in Coal Geology
- Diploma in Psychology
- Master of Psychology (Clinical)
- Master of Psychology (Educational)
- Master of Science

**Doctor of Philosophy**

**REQUIREMENTS FOR THE DIPLOMA IN COAL GEOLOGY**

1. In these Requirements, unless the context or subject matter otherwise indicates or requires:
   - "the Department" means the Department of Geology;
   - "the Diploma" means the Diploma in Coal Geology;
   - "the Faculty Board" means the Faculty Board of the Faculty of Science.

2. An application for admission to candidature for the Diploma shall be made on the prescribed form and lodged with the Secretary to the University by the prescribed date.
3. An applicant 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. Such approval shall be subject to such conditions as the Faculty Board may determine on the recommendation of the Head of 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 on the recommendation of the Head of the Department, the programme shall be completed in not less than two years of part-time enrolment.
   *(3) The programme shall include periods of attendance at both the University of Newcastle and the University of Wollongong as prescribed by the Faculty Board on the recommendation of the Head of Department.
6. A candidate's programme shall require approval by the Faculty Board on the recommendation of the Head of the Department.
7. 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.
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; or
   (b) Educational Psychology.
4. The Diploma shall be awarded in one grade only.
5. 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.
6. In exceptional circumstances, the Senate may, on the recommendation of the Faculty Board, relax any provision of these Requirements.

* It is likely that in future all periods of attendance will be at Newcastle. An amendment has been proposed to this section of the Requirements.

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**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 of the University of Newcastle or another university approved for this purpose by the Faculty, provided that the course completed for that degree by the applicant included a major study in Psychology.
   (b) A candidate permitted to register provisionally under the provisions of subsection (a) of this Section shall complete such work and pass such examinations at Bachelor's degree honours level as may be prescribed by the Faculty Board before his registration may be confirmed by the Faculty Board.
9. A candidate for the Diploma in the Clinical Specialisation shall, in not less than two years of part-time enrolment, attend such lectures, seminars and tutorials; complete such written and practical work; and pass such examinations as may be prescribed by the Board of Studies.

**Educational Specialisation**

10. An applicant for registration as a candidate for the Diploma in the Educational Specialisation shall:
   (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 GOVERNING MASTERS DEGREES**

**PART I — GENERAL**

1. (1) These Regulations, including the Schedules thereto, 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) and Master of Science.

(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 otherwise as may be specified in the Schedule; and

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

(2) Unless otherwise specified in the Schedule, applications for admission to 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 under Regulation 8(1) of these Regulations may request that the Faculty Board cause his case to be reviewed. Such request shall be made to the Dean of the Faculty within seven days from the date of posting to the candidate the advice of the Faculty Board's decision or such further period as the Dean may accept.

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

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

PART II — EXAMINATION AND RESULTS

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

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

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

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

(c) to require the candidate to undertake such further oral, written or practical 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 THESES

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

(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.

At present there is no fee payable.
(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 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 11 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 work submitted by candidates in pursuing those programmes.

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

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

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

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

(2) Before approving an 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. To qualify for admission to the degree the candidate shall:

(a) in not less than two years 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.

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

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

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

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

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

and shall submit these to the Faculty Board together with its recommendation. The Faculty Board shall make its decision in the light of these reports and on the recommendation of the Board.

SCHEDULE 10 — MASTER OF PSYCHOLOGY (EDUCATIONAL)

1. (1) The Faculty of Science shall be responsible for the course leading to the degree 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 work submitted by candidates in pursuing those programmes.

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

(a) have satisfied all the requirements for admission to a degree of bachelor of the University of Newcastle or to a degree, approved for this purpose by the Faculty Board, of another university and have satisfactorily completed a Part III Psychology subject or reached a standard in Psychology deemed by the Board to be equivalent; and

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

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

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

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

(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. To qualify for admission to the degree the candidate shall:
   (a) in not less than 2 years, 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.

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

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

and shall submit these to the Faculty Board together with its recommendation. The Faculty Board shall make its decision in the light of these reports and on the recommendation of the Board.

SCHEDULE II — MASTER OF SCIENCE

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

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

(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.

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 B.Sc. Schedule of Subjects must be passed.

Year IV  
One subject, which is a Science Part III subject if this requirement has not already been met (and is from a department different from that providing the Arts Part III subject), and two other subjects to complete the Requirements for the degree of Bachelor of Science.

Science/ Mathematics

Normally the combined degree programme would be pursued as follows:

Year I  
Mathematics I and three Part I subjects passed with an average performance of credit level or higher.

Year II  
Three Part II subjects including Mathematics II A and Mathematics II C, and another Part I subject.

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

Year IV  
Either Mathematics III B or a schedule B subject from the requirements for B.Math., plus two other subjects which will complete the requirements for the Science degree.

Science/ Engineering

See details in Faculty of Engineering Handbook

Faculty Policy in regard to the Granting of Standing for Diploma Courses Completed through the CEA

The Faculty Board is willing to grant standing to Diplomates of Teachers Colleges and Colleges of Advanced Education who have taken an approved amount of Science in their course. The minimum requirements for the award of the ordinary degree of Bachelor of Science would be satisfied by the completion of a major sequence, i.e. part I, II and III in an approved Science discipline, and a minor sequence, i.e. part II in a different approved Science discipline.

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 for Science students wishing to take Mathematics subjects.

Entry to Mathematics subjects at the part III level requires successful completion of two full Mathematics subjects at the part II level. In order to increase the range of choice available to students in the Faculty of Science at the part II level, a special Science subject has been introduced at the part III level, which will allow students in the Faculty of Science to choose topics from the part III Schedule of the Department of 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 part III Schedule of the Department of 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 Part III Mathematics Schedule with the Head of the Department in the Faculty of Science offering the other part III subject.

663500 SM III  (This unit will probably be offered for the first time in 1982).

Prerequisites  
Mathematics II A or II B 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, 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. For list see Subject Computer numbers at the end of this Handbook. For further information see under "Mathematics" in this book. For details 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  
Nil, but a series of 10 lectures in background chemistry will be offered during orientation week (22nd to 26th February, 1982, between 9.30 and 11.30 a.m. each day in the Department of Biological Sciences lecture theatre, J.L.GOB) 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, mitosis.
Biological Energy Processes
Photosynthesis. Respiration (aerobic and anaerobic). Chemosynthesis. Production of ATP.

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
Martin, E. A. A Dictionary of Life Sciences (Pan 1976)

References
Ayala, F. M. & Kiga, J. A. Modern Genetics (Benjamin Cummings 1980)
Clarke, R. B. & Panchen, A. L. Synopsis of Animal Classification (Chapman & Hall)
Holloway, B. W. Genes and Chromosomes in Action (Thomas Nelson)
Moroney, M. J. Facts from Figures (Penguin)
Parker, R. E. Introductory Statistics for Biology (Edward Arnold 1973)
Rayle, D. & Wedberg, L. Botany: A Human Concern (Houghton Mifflin 1975)

712100 Biology IIA
712101 Biochemistry & Molecular Genetics
712102 Cell Biology

Molecular and Cellular Biology
Prerequisites Biology 1
Hours 3 lecture hours and 6 hours tutorial and laboratory classes per week
Examination Two 3-hour papers

Content
Biochemistry and Molecular Genetics

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
Bailey, N. T. J. Statistical Methods in Biology (English U.P. 1964)
De Robertis, E. D. P. & De Robertis, E. M. Cell and Molecular Biology 7th edn (Holt-Saunders 1980)
Goodenough, V. Genetics 2nd edn (Holt, Rinehart & Winston 1978)
Smith-Keary, P. F. Genetic Structure and Function (McMillan 1979)

References
Giese, A. C. Cell Physiology 5th edn (Saunders 1979)
Wold, F. Macromolecules: Structure and Function (Prentice-Hall 1971)

712200 Biology IIB
712201 Comparative Structure & Function
712202 Animal Ecology & Population Genetics

Biology of Organisms and Populations
Prerequisites Biology 1
Hours 3 lecture hours and 6 hours tutorial and laboratory classes per week
Examination Two 3-hour papers

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

Ecology and Population Genetics
Physical and biological factors influencing the abundance and distribution of organisms. Determination and measurement of these factors. Genetic analysis of populations. Factors affecting gene frequencies in populations.

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.
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.

Texts
& Satter, R. L.
Oppenheimer, S. B. *Introduction to Embryonic Development* (Allyn & Bacon 1980)
Zar, J. H. *Biostatistical Analysis* (Prentice-Hall)

References
Balinsky, B. I. *An Introduction to Embryology* 4th edn (Saunders 1976)
Berrill, N. J. & Karp, G.
Billett, F. S. & Wild, A. E.
Graham, C. F. & Warning, P. F.
Solsbury, F. B. & Ross, C. W.

713101 Biology IIIA
Biology IIIA consists of two units, Developmental Biology, and Immunology and Cell Processes.

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

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
Cunningham, A. J.
Zar, J. H.

References
Bistatatistical Analysis (Prentice-Hall)

McGilvery, R. W.
Metzler, D. E.
White, A. et al.

713200 Biology III B
Biology III B consists of two units, Environmental Physiology, and Ecology and
Quantitative Genetics.
It is possible to substitute a unit from Biology III A for either of these Biology III B units,
allowing flexibility of choice of topics.

Biology III B, Topic 3

713201 Environmental 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

Texts
Baker, D. A. Transport Phenomena in Plants (Chapman & Hall 1978)
Mithorpe, F. L. & Moodie, J. An Introduction to Crop Physiology 2nd edn
(Cambridge U. P. 1980)
Nalbandov, A. V. Reproductive Physiology 3rd edn (Freeman 1976)

References
Austin, C. R. & Short, R. V. Reproduction in Mammals Vols. 1-8 (Cambridge
1972)
Bloom, W. & Fawcett A Textbook of Histology 10th edn (Saunders 1975)
Evans, L. T. Crop Physiology (Paper back ed. Cambridge University
Press)
Leopold, A. C. & Kriedemann, P. E. Plant Growth and Development (McGraw-Hill 1975)
Setchell, B. P. The Mammalian Testis (Paul Elek 1978)
Torey, T. W. & Peducci A. Morphogenesis of the Vertebrates 4th edn (John Wiley
1979)

Biology III B, Topic 4

713204 Ecology and Quantitative Genetics

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
Ecology
Structure and dynamics of biological communities, evolutionary ecology.
Quantitative Genetics
Continuous variation components of generation means. Heritability. The effect of
selection and inbreeding. Neutral traits.

Texts
Falconer, D. S. Introduction to Quantitative Genetics
2nd edn (Longman 1981)
Krebs, C. J. Ecology 2nd edn (Harper & Row)
Stewart, J. (ed.) S299 Genetics. Units 11, 12, 13 (Open University Press
1976)
Zar, J. H. Biostatistical Analysis (Prentice-Hall)

References
C.S.I.R.O. The Australian Environment (Melbourne University
Press 1970)
Daubenmire, R. F. Plants and Environment 3rd edn (Wiley 1974)
Ford, E. B. Ecological Genetics (Methuen 1975)
Kershaw, K. A. Quantitative and Dynamic Plant Ecology 2nd edn
(Arnold 1973)

714100 Biology IV

Prerequisite Nil

Hours To be advised

Examination

DEPARTMENT OF CHEMISTRY

721100 Chemistry I

Prerequisites Nil

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

Examination
A student may satisfy the examiners: EITHER
by achieving an overall satisfactory performance in the progressive examinations
OR
by achieving satisfactory performance in the final
3 hour examination scheduled in the November
examination period.
Students who attempt both sets of examination
will be credited with the higher of the two results.
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.
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**
- Ayward, G. H. & Findlay, T. J. V.  
  *S. I. Chemical Data* 2nd edn (Wiley 1974)
- Hart, H. & Schuetz, R. D.  
  *Organic Chemistry* 5th edn (Houghton Mifflin 1978)
- Brown, T. L. & LeMay, H. E.  

**722200 Chemistry IIA**

**Prerequisite**
Chemistry I

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

**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; spectroscopic procedures; separation methods.

**Inorganic Chemistry**
Symmetry and structure; main group metal chemistry; types of co-ordination complexes; structure elucidation; transition metal chemistry.

**Dynamics**
Kinetics; chemical affinity; electrochemical cells.

**Organic Chemistry**
Aliphatic and aromatic chemistry.

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

**Texts**
- Atkins, P. W.  
  *Physical Chemistry* (Oxford 1978)
- Cotton, F. A. & Wilkinson, G.  
  *Basic Inorganic Chemistry* (Wiley 1976)
- Geissman, T. A.  
  *Principles of Organic Chemistry* 4th edn (Freeman 1977)
- Pine, S. H.  

*OR*

Also advisable, particularly if proceeding to Chemistry IIB.

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Peczok, R. L. Shields, L. D.,  
*Modern Methods of Chemical Analysis*  
2nd edn (J. Wiley & Sons (Sydney) 1976)

Shoemaker, D. P. & Garland, C. W.  

**722300 Chemistry IIB**

Students intending to enrol in this subject in 1982 should first contact the Head of Department.

**Prerequisites**
Chemistry I

**Corequisites**
Chemistry IIA (advisory)

**Hours**
3 lecture hours and 6 laboratory hours per week. The subject comprises 6 units. Each unit consists of approximately 10 lecture, 4 tutorials and associated laboratory or other support activities.

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

**Content**
The units offered may vary from year to year and 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

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**CHEMISTRY — PART III SUBJECTS**

**Prerequisites**

A pass in Chemistry IIA is a prerequisite for entry into Chemistry IIIA; Chemistry IIIA is a pre- or corequisite for Chemistry IIB; Mathematics I.

**Hours**
The Chemistry Department offers two Part III subjects, each involving ninety 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 IIB must select nine topics from the list provided by the Department. Likewise, students enrolling in Chemistry IIB must nominate nine topics from the IIB listing.

All proposed programmes must be approved by the Head of Department (or his nominee) before the start of the academic year.
Texts
To be advised: see departmental topic summaries.

724100 Chemistry IV

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

Hours
To be advised

Examination
Content
A subject extending over one full-time academic year or its part-time equivalent, comprising:
(i) a minimum of 50 hours of lectures and tutorials, and a course of directed reading;
(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 New South Wales.

Texts
Black, R. M.
Either
Press, F. & Siever, R.
OR
Sawkins, F. J. et al.
The Elements of Palaeontology (Cambridge U.P. 1970)
Earth (Freeman 1978)
The Evolving Earth 2nd edn (Collier-Macmillan 1978)
The University of Newcastle Calendar consists of the following volumes:

Volume 1 — Legislation: The Act, By-laws and Regulations
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 1980.

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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January
1 Friday  Public Holiday — New Year's Day
8 Friday  Last day for return of Re-Enrolment Forms
          Continuing Students
18 Monday Deferred Examinations begin
29 Friday Deferred Examinations end
31 Closing date for applications for residence in
       Edwards Hall

February
1 Monday  Public Holiday — Australia Day
10 Wednesday  New students attend in person to enrol and pay
           charges
22 Monday  Late enrolment session for new students

March
1 Monday  First Term begins

April
9 Friday  Good Friday — Easter Recces commences
13 Wednesday Lectures resume
21 Wednesday Last day for withdrawal without academic penalty
            from first half year subjects
            (See page (vii) for Dean’s discretion)
26 Monday  Public Holiday — Anzac Day 25 April

May
1 Saturday  First Term ends
17 Monday  Examinations begin
21 Friday  Examinations end
24 Monday  Second Term begins

June
11 Friday  Last day for return of Confirmation of Enrolment
          forms
14 Monday  Public Holiday — Queen’s Birthday
30 Wednesday Closing date for Applications for Admission to the
         Bachelor of Medicine course in 1983

July
5 Monday  Last day for withdrawal without academic penalty
          from full year subjects
          (See page (vii) for Dean’s discretion)
5 Monday  Examinations begin
9 Friday  Examinations end

August
7 Saturday  Second Term ends
9 Monday  Examinations begin
13 Friday  Examinations end
30 Monday  Third Term begins

September
6 Monday  Last day for withdrawal without academic penalty
          from second half year subjects
          (See page (vii) for Dean’s discretion)

October
1 Friday  Closing date for Applications for Admission 1983
          (Undergraduate courses other than Medicine)
4 Monday  Public Holiday — Eight Hour Day
30 Saturday  Third Term ends

November
1 Monday  Annual Examinations begin
19 Friday  Annual Examinations end

Note: Term dates for students in the Bachelor of Medicine course are

1983

January
17 Monday  Deferred Examinations begin
28 Friday  Deferred Examinations end

February
28 Monday  First Term begins
II GENERAL INFORMATION

Enrolment of New Students

Persons offered admission are required to attend in person at the Great Hall in mid-February to enrol and pay charges. Detailed instructions are given in the Offer of Admission.

Enrolment of Continuing Students

The University makes arrangements for continuing students to enrol by mail. There are two steps involved:

- Lodging the Enrolment form with details of your proposed programme,
- Completing enrolment by lodging the Authority to Complete Enrolment form with the cashier with charges payable.

1. Lodging Enrolment Forms

Re-enrolment materials will be mailed to all undergraduate students in mid-December. Those who wish to enrol in 1982 and who are eligible to do so (see Regulations Governing Unsatisfactory Progress) should complete the enrolment form as soon as possible after the release of the 1981 annual examination results, and forward it to The Secretary, University of Newcastle, N.S.W., 2308.

Enrolment forms from continuing students are due by 8 January 1982 except in the case of a student who is required to take a special or deferred examination in which case the enrolment form must be submitted within seven days of the release of those examination results.

Submission of enrolment forms after the due date will render the student liable to a late lodgement charge of $14.00.

Students who, for good reason, are unable to submit their enrolment forms by the due date, may apply for an extension of time. The request, with details of the reason for the extension must reach the Secretary by the due date if the late lodgement charge is to be avoided. The By-laws provide that no enrolment will be accepted after 31 March without the approval of the Secretary.

2. Completing Enrolment

When the proposed programme has been approved, an Authority to Complete Enrolment form will be mailed to the student showing charges payable. Students are required to complete enrolment by lodging the form with the Cashier with the charges payable. This can be done by mail or in person. The Cashier's office is open 10 am to 12 noon and 2 pm to 4 pm Monday to Friday. At least 14 days notice is allowed from the date of posting to the date by which charges must be paid if a late charge is to be avoided.

Student Cards

The Authority to Complete Enrolment form incorporates the student's identification card which is returned to him after payment of charges. It should be carried by students when at the University. It serves as evidence that the student is enrolled and must be presented when applying for travel concessions, a parking permit or to confirm membership of the University Union.

If a student loses his Student Card he should pay the replacement charge of 50 cents to the Cashier and present the receipt at the Student Administration Office when seeking a replacement card.

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

Library Cards

Students should present their Student Card to the Library desk to be issued with their Library Borrowers Card. This card, which has machine readable lettering, must be presented when borrowing books from the Library.

Re-admission after Absence

A person who has been enrolled previously at the University of Newcastle, but not enrolled in 1981, is required to lodge an Application for Admission if further undergraduate enrolment is desired. Applications are available from the Student Administration Office and should preferably be lodged by 1 October 1981.

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.

Failure to notify changes could lead to important correspondence or course information not reaching the student. The University cannot accept responsibility if official communications fail to reach a student who has not notified the Student Administration Office of a change of address.

It should be noted that examination results, re-enrolment and other correspondence will be mailed to students in December and January. Students who will be away during the long vacation from the address given to the University for correspondence should make arrangements to have mail forwarded to them.

Change of Name

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

Change of Programme

Approval must be sought for any changes to the programme for which a student has enrolled. This includes adding or withdrawing subjects, changing attendance status (for example from full-time to part-time) or transferring to a different degree or faculty.

All proposed changes should be entered on the Variation of Programme form available at the Student Administration Office. Reasons for changes and where appropriate documentary evidence in the form of medical or other appropriate certificates must be submitted.

Withdrawal

Application to withdraw from a subject should be made on a Variation of Programme form and lodged at the Student Administration Office or mailed to the Secretary.

Applications received by the appropriate date listed below will be approved for withdrawal without a failure being recorded against the subject or subjects in question.

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<tr>
<th>Full Year Subjects</th>
<th>First Half-Year Subjects</th>
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</thead>
<tbody>
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<td>Withdrawal Dates</td>
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<tr>
<td>Monday</td>
<td>19 August 1982</td>
<td>Monday 19 April 1982</td>
</tr>
<tr>
<td>2 August 1982</td>
<td>19 August 1982</td>
<td>6 September 1982</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 penalty.
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 apply 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 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.

Any student who does not enrol for a period of two years and does not obtain leave of absence, must apply for re-admission to the University when he wishes to resume his studies.

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 seamy fashion. Smoking is not permitted during lectures, in examination rooms or in the University Library. Gambling is forbidden.

Members of the academic staff of the University, senior administrative officers, and other persons authorised for the purpose have authority to report on disorderly or improper conduct occurring in the University.

Notices
Official University notices are displayed on the notice boards and students are expected to be acquainted with the contents of those announcements which concern them.

A notice board on the wall opposite the entrance to Lecture Theatre 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: 17 to 21 May, 1982
- Mid Year: 5 to 9 July, 1982
- End of Second Term: 9 to 13 August, 1982
- End of Year: 1 to 19 November, 1982

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.

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 each examination will be on a noticeboard outside the room.

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

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

- to a student who is prevented from bringing into a room a programmable calculator;
- to a student who uses a calculator incorrectly; or
- because of battery failure.

Rules for Formal Examinations
Regulation 15 of the Examination Regulations sets down the rules for formal examinations, as follows:

- candidates shall comply with any instructions given by a supervisor relating to the conduct of the examination;
- 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;
- no candidate shall enter the examination room after thirty minutes from the time the examination has begun.

* A programmable calculator will be permitted provided program cards and devices are not taken into the examination room.
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 re-enrolment forms by Friday 8 January 1982.

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.

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

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

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

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

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

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

       (b) failure to complete laboratory work;

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

       (d) failure to complete field work.

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

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

4. (1) A student whose enrolment in a subject is terminated under this Regulation shall be deemed to have failed the subject.

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

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

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

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

   (i) in the course; or

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

   (iii) in the Faculty; or
(2) A student who has been excluded from further enrolment in any course, Faculty or from the University under these regulations may apply for permission to enrol therein again provided that in no case shall such re-enrolment commence before the expiration of two academic years from the date of the exclusion. A decision on such application shall be made:
(a) by the Faculty Board, where the student has been excluded from a single course or a single Faculty; or
(b) by the Admissions Committee, in any other case.

9. (1) A student whose application to enrol pursuant to Regulation 8 (1) or 8 (2) (a) of these Regulations is rejected by a Faculty Board may appeal to the Admissions Committee.
(2) A student whose application to enrol pursuant to Regulation 8 (2) (b) of these Regulations is rejected by the Admissions Committee may appeal to the Vice-Chancellor.

V CHARGES
Enrolment is completed by lodging with the Cashier the approved Authority to Complete Enrolment form with a remittance to cover all charges due or evidence that a sponsor will meet these charges.
New students are required to pay charges when they attend to enrol.
For re-enrolling students at least 14 days notice is allowed from the date of mailing the Authority to Complete Enrolment form to the date by which charges must be paid. The actual date, which will not be before mid February, will be printed on the form. A later date will be set if approval of the proposed programme has been delayed or if the student has taken Special or Deferred examinations.

Charges

1. General Services Charge
(a) Students Proceeding to a Degree or Diploma
   - Full-time students .......................................................... $120.50 Per annum
   - Part-time students ....................................................... $115.50 Per annum
   - Postgraduate Students joining Newcastle University Union for the first time ......................................................... $10
(b) Non-Degree Students
   - Union charge ................................................................. $56 Per annum

   The above charges must be paid in full by the prescribed date.

2. Late Charges
   (a) Late Lodgement of Enrolment Form
      - Where a continuing student does not lodge application by Friday, 8 January, 1982 ......................................................... $14
      - Where a candidate for a special or deferred examination in January does not lodge re-enrolment application by Monday, 5 February, 1982 ......................................................... $14
   (b) Late Lodgement of Authority to Complete Enrolment Form with Cashier
      - Where the Authority to Complete Enrolment Form together with
         (i) General Services Charge payable; or
         (ii) evidence of sponsorship (e.g. scholarship voucher or letter from Sponsor); or
Tuition Fees

The Commonwealth Government has announced its intention that tuition fees be payable in some circumstances from 1982. At the time of printing, the necessary legislation was still to be passed. If tuition fees are introduced a statement will be sent to those students who are affected.

VI CAMPUS TRAFFIC AND PARKING

Persons wishing to bring motor vehicles (including motor cycles) on to the campus are required to obtain and display on the vehicle a valid permit to do so. Permits may be obtained from the Attendant (Patrol) Office which is located off the foyer of the Great Hall. Permit holders 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 Vice-Principal, after affording the person a period of seven days in which to submit a written statement is satisfied that any person is in breach of Regulations, he may:
(a) warn the person against committing any further breach; or
(b) impose a fine; or
(c) refer the matter to the Vice-Chancellor.

The range of fines which may be imposed in respect of various categories of breach include:
- Parking in areas not set aside for parking
- Parking in special service areas, e.g. loading bays, by fire hydrants, etc.
- Failing to display a valid permit
- Driving offences - including speeding and dangerous driving
- Failing to stop when signalled to do so by an Attendant (Patrol)
- Refusing to give information to an Attendant (Patrol)
- Failing to obey the directions of an Attendant (Patrol)

The Traffic and Parking Regulations are stated in full in the Calendar, Volume I.
EITHER
Read, H. H.
OR
Mason, B. &
Berry, L. G.
Uyeda, S.

Rutley's Elements of Mineralogy 24th cdn (Murby 1960)
Mineralogy (Freeman 1959)
(The New View of the Earth (Freeman 1978)

732200 Geology IIA

Prerequisite

Geology 1

Hours

3 lecture hours and 4 laboratory hours per week and 6 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.

Texts
Bishop, A. C.
Brown, D. A. et al.
Clarkson, E. N. K.
Nockolds, S. R. et al.
Hobbs, B. E. et al.
Kerr, P. F.

An Outline of Crystal Morphology (Hutchinson 1967)
The Geological Evolution of Australia and New Zealand (Pergamon 1959)
Invertebrate Palaeontology and Evolution (Allen & Unwin 1979)
Petrology (Cambridge 1978)
An Outline of Structural Geology (Wiley Int. 2nd cdn 1981)
Optical Mineralogy (McGraw-Hill 1977)

732300 Geology IIB

Prerequisite

Geology 1

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 petrological materials; presentation of petrological 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.

Geomathematics
Elementary introduction to basic mathematics and data processing in geology.

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

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

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

733100 Geology IIIA
Prerequisites
Geology I & IIA
Preparatory Subjects
Chemistry I & either Physics 1A or IB
Hours
5 lecture hours and 6 laboratory hours per week and 4 days field work
Examination
Two 3-hour papers, class assignments and practical examinations

Content
Petroleum
Petroleum 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
Carnichael, I. S. E. et al.
Hobbs, B. E. et al.
Igneous Petrology (McGraw-Hill 1974)
An Outline of Structural Geology (Wiley Int. 2nd edn 1981)
Stanton, R. L.
Turner, F. J.
Ore Petrology (McGraw-Hill 1972)

For others, consult lecturers concerned.

733200 Geology IIIB
Prerequisites
Geology I & IIA
Corequisite
Geology IIIA
Hours
4 lecture hours and 4 laboratory hours per week and 12 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 plan; stress-strain relationship; 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 IIIA, completion of ordinary degree requirements and permission of the Head of Department

Hours
To be advised

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

Content
Part A
Lecture-tutorial work with directed reading in two of the following fields of geology: mineralogy and crystallography; geochemistry; igneous petrology; metamorphic petrology; coal petrology; sedimentology; stratigraphy; palaeontology; structural geology; economic geology.
Not all fields will be available every year.

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

664590 Geology/Mathematics IV

Prerequisites
Geology IIIA or IIB 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
To be advised

Examination

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.
Content

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

Topic B — Instrumentation Theory.

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

Topic D — Basic Device Physics;
Measurement Devices.

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

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

Text
Malmsdot, H. V.
et al.

Prerequisites

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

Mathematics I, Physics I A or normally a credit
pass or better in Physics I B.

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.

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 III B

This subject will not be offered in 1982.

Corequisite

Physics III A

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 III B, 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 III A. Attention is drawn to degree
requirements for Honours, p. 20.

Normally a grade in Physics III A of a credit or better
is required.

Hours

100-120 lecture hours and a research project.

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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, 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, a seminar on the project and in general an oral examination.

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 theory, surface physics, geophysics, biophysics and aspects of applied physics.

In 1982, 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

Prerequisites

Physics IIIA & Mathematics IIIA

Hours

To be advised and, in addition, a research project of mathematical and physical significance jointly supervised.

Examination

Assessment will be in the appropriate Physics IV and Mathematics IV topics selected. In addition the research project will be evaluated and normally an oral examination will be conducted.

Content

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.

DEPARTMENT OF PSYCHOLOGY

751100 Psychology I

Prerequisites

Nil

Hours

3 lecture hours and one 2-hour practical/tutorial session

Examination

One 3-hour paper and an assessment of practical work

Content

A general introduction to psychology, including such topics as learning theory, perception, developmental psychology, physiological psychology, theory of measurement and descriptive statistics, statistical analysis of data, human information processing, and humanistic psychology.

Texts

To be advised

752100 Psychology IIA

Prerequisite

Psychology I

Hours

3 lecture hours, one 2-hour practical session and one hour tutorial per week

Examination

Two 3-hour papers and an assessment of practical work

Content

Such topics as scientific method, learning, physiological psychology, mathematical models, cognition, perception, information processing and animal behavior. Statistical methods will be taught and tested during the year.

Texts

To be advised

752200 Psychology IIB

Prerequisite

Psychology I

Hours

3 lecture hours, one 2-hour practical session and 1 tutorial hour per week

Examination

Two 3-hour papers and an assessment of practical work

Content

Such topics as developmental psychobiology, drugs and behaviour, clinical neuropsychology, personality, social psychology, abnormal psychology, the development of relationships, dreams, fantasy and body-awareness, and test construction. Statistical methods will be taught and tested during the year.

Texts

To be advised
753100  Psychology IIIA

Prerequisite  Psychology IIIA

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

Examination  Two 3-hour papers and an assessment of practical work

Content  Such topics as cognition, genetic constraints on learning, human information processing, physiological psychology, animal communication, statistical analysis, experimental method, consciousness, social psychology, vision and perceptual development.

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  To be advised

753200  Psychology IIIB

Prerequisite  Psychology IIIB

Hours  4 lecture hours and approximately 5 hours practical work per week

Examination  Two 3-hour papers and an assessment of practical work

Content  Such topics as social psychology, psychopathology development, and neuropsychology, quantitative psychology, cross-cultural psychology, abnormal psychology, biofeedback, statistics, non-verbal behaviour, ergonomics and human factors. Practical work comprises workshop and laboratory work for up to 3 hours per week plus a supervised independent experimental project.

Texts  To be advised

754100  Psychology IV

Prerequisites  Completion of an ordinary degree 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 IIIA and IIIB, and 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  To be advised

664200  Psychology/Mathematics IV

Prerequisites  Mathematics IIIA & Psychology IIC

Hours  To be advised

Examination  To be advised

Content  4 Mathematics topics chosen from the Part IV Mathematics topics (see Faculty of Mathematics Handbook).

Psychological Measurement (see below).

Mathematical Models in Perception and Learning (see below).

(i)  Psychological Measurement — J. A. Keats

Prerequisites  Nil

Hours  1½ hours per week

Examination  To be advised

Content  The logic of measurement and its application to psychological phenomena and at least one paper on one of the more recently developed psychological scaling methods.

Text  Nil

(ii)  Mathematical Models in Perception and Learning — R. A. Heath

Prerequisites  Part II Mathematics Topic II recommended

Hours  1½ hours per week

Examination  To be advised

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 viva 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)

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

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

Examination
Professional proficiency is evaluated through practical examinations and ongoing assessments. There is a formal examination at the end of the first year and an assessment of 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 will be devoted to seminar and workshop activities and thesis supervision will continue 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. The thesis begun in the previous year will be completed.

DEPARTMENT OF GEOGRAPHY

351100 Geography I — (Assoc. Professor P. G. Irwin, Dr H. A. Bridgman, Mr G. N. McIntyre, Dr L. de Castro Lopo, Mr K. W. Lee)

Prerequisites
Nil

Hours
4 hours of lectures/tutorials/methods per week, 2 days of field work per year.

Examination
To be advised

Content
The lecture component studies the structure and interaction of two major systems, the ecological system that links man and his environment, and the spatial system that links one region with another in a complex interchange of flows. The study explores the internal structure and the linkages between each of the basic components in the two systems. Half of the time in terms II and III is devoted to the Australian climatic environment, where climatic and weather patterns affecting Australia are discussed. Linkages with the human environment and between regions will be emphasized. The methods/tutorial components are closely integrated with the lecture programme. They are designed to acquaint students with some geographical techniques, concepts and methods of interpretation appropriate to the study of the above.

Texts
— Manual of meteorology rev. edn (Bureau of Meteorology 1977)

352100 Geography IIA: Human Geography

Prerequisite
Geography I

Hours
5 hours per week of lectures, practicals and tutorials, and one hour per week of Methods*
(Note: Students also enrolled in Geography IIB must count Methods in IIA only, and count the alternative strand. * Environmental Issues in Australia in IIB only.)

* Strands common to Geography IIA and IIB
Examination
To be advised

Content
A study of human activities within the context of space and time. In 1982 themes will be established around the following specific fields of interest:

Development Geography (Dr W. J. Jonas): principles, issues in world development; measures and models; dualism; modernisation; trickle-down hypothesis; regional development; colonialism; capitalism; imperialism; the development of underdevelopment.

East Asia (Dr R. E. Barnard): selected aspects of the geography of China and Japan, including population, agriculture and manufacturing; contrasting patterns emerging from development in the two countries; sub-national studies to illustrate differences in national development within the two countries.

Economic Geography (Miss M. R. Hall): key questions of economic geography; trends in the location of economic activity; models of the location of extractive industry; trends in steel making location; “developing world” case studies; review of “The new international economic order”.

Urban Geography (Asoc Prof D. N. Parkes): growth of urbanisation; urban functions and classification; systems of settlement, patterns and processes within urban areas; urban land use; population density and social space; urban ecology; perception and behaviour; human activity and movement systems.

Text
Nil

352260 Geography IIB

Prerequisite
Geography I

Hours
5 hours of lectures/practical/tutorial and one hour of Methods* per week.
(Note: Students also enrolled in Geography IIA must count Methods in IIA only, and count the alternative strand, Environmental Issues in Australia* in IIB only.)

Examination
To be advised

Content
A study of man's physical environment. In 1982 themes will be established around the following specific fields of interest:

Geomorphology (Dr R. J. Loughran): An introduction to the study of landforms, including some basic geology, weathering, soils, mass movement, river processes and valley formation, landforms of arid and cold climatic zones, coastal geomorphology, and applied and climatic geomorphology.

Climatology (Dr H. A. Bridgman, Mr G. N. McIntyre): An introduction to the study on a synoptic and meso-climatic scale including radiation and heat budgets; thermodynamics; precipitation processes; climate 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 or organisms will be explored.

Texts
Ric, R. J. Fundamentals of Geomorphology (Longman 1977)
Linacre, E. & Hobbs, J. The Australian Climatic Environment (Wiley 1977)

(a) Methods (to be taken by all students) — 1 hour per week (Assoc. Prof. D. N. Parkes and other members of staff).

Text
Nil

(b) Environmental issues in Australia (to be taken only by those students taking both IIA and IIB) — 1 hour per week (Asoc. Prof. P. G. Irwin).

The aim of this strand is to acquaint students with some of the major issues related to the Australian environment. The issues, while being based on the fundamental characteristics of climate, soils, vegetation 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 droughts, floods and other natural hazards; the problems of population distribution; coastal and maritime disputes; aboriginal land rights.

Text
Heathcote, R. L. Australia (Longman 1975)

Part III Subjects

The Geography Department offers two Part III subjects, each comprising three topics chosen from the list below.

LIST OF TOPICS FOR PART III GEOGRAPHY

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>L</td>
<td>Advanced climatology</td>
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<tr>
<td>O</td>
<td>Biogeography</td>
</tr>
<tr>
<td>P</td>
<td>Advanced economic geography</td>
</tr>
<tr>
<td>Q</td>
<td>Advanced urban geography</td>
</tr>
<tr>
<td>T</td>
<td>Southeast Asia</td>
</tr>
<tr>
<td>V</td>
<td>Explanation in geography</td>
</tr>
</tbody>
</table>

353100 Geography IIIA

Prerequisite
Geography IIA, IIB or IIC

Hours
Six hours per week of lectures, practical classes and tutorials. Each topic may require up to 3 days of fieldwork or its equivalent per year.

Examination
To be advised

Content
Three topics selected from the list above and not included in Geography IIB.
353200 Geography IIIB

Prerequisites
Geography IIA, IIB or IIC

Hours
Six hours per week of lectures, practical classes and tutorials. Each topic may require up to 3 days of fieldwork or its equivalent per year.

Examination
To be advised

Content
Three topics selected from the list above and not included in Geography IIA.

Part III Topics

353202 Topic I — Advanced Climatology — Dr H. A. Bridgman, Mr G. N. McIntyre

Content
Processes in agricultural climatology. Meso- and macro-scale pollution problems and trends, and their relation to climatic change.

Texts
Wiesner, C. J. *Climate, irrigation & agriculture* (Angus & Robertson 1970)

353204 Topic O — Biogeography — Dr J. C. Turner

Content
Study of some basic concepts in biogeography; an introduction to ecology with emphasis on man as an inseparable part of nature; approaches towards ecological harmony between man and the rest of nature.

Texts
Bates, M. *The forest and the sea* (Vintage paperback 1960)
Kellman, M. C. *Plant geography* (Methuen paperback 1975)
Leopold, A. *A sand country almanac, with other essays on conservation from Round River* (Oxford U.P. paperback 1966)
Mowat, F. *Never cry wolf* (Pan paperback 1979)

353205 Topic P — Advanced Economic Geography — Dr W. A. Jonas

Content
The main topic areas studied are agricultural location theory, transportation networks and impact studies, markets and marketing, and underdevelopment.

Text
Nil

353206 Topic Q — Advanced Urban Geography — Assoc. Professor D. N. Parkes

Content

Text
Nil

353209 Topic T — Southeast Asia — Dr R. E. Barnard

Content
The examination of various concepts relating to the geography of development in Southeast Asia and the application of these concepts to selected parts of the region. The relationship between the modern and traditional sectors of Southeast Asia's economy are particularly emphasised.

Text
Nil

353211 Topic V — Explanation in Geography — Miss M. R. Hall

Content
The course emphasises the study of primary sources. It consists of two basic sections: (i) Knowing the world; identification of the relevant tools for interpretation; (ii) the known world: study of the development of geography through the history of cartography and the study of sample texts for the mid 19th century and the period since 1960.

Preliminary reading:

Text

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, must have been passed at Credit level or better. The student must also satisfy the Head of the Department of his/her competence in the area of study within which the proposed research topic lies.

Hours
To be advised

Examination

Content

I. Research
A thesis embodying the result of an original investigation on a topic approved by the Head of the Department of Geography.

II. Coursework — 4 hours per week, Terms I and II.
A. Knowing the world - an explanation component.
B. Seminars on Big issues
C. Seminars on methodological problems
D. Work experience inputs from other-than-academic area
Note: A candidate who wishes to proceed to Honours should notify the Head of Department by the commencement of Third Term 1982, and must confirm this as soon as final results for the year are known. Candidates are expected to commence work on their theses early in the new year.

DEPARTMENT OF MATHEMATICS

Preliminary Notes
The Department offers and examines subjects. Each subject is composed of topics, each single-unit topic consisting of about 27 lectures and 13 tutorials throughout the year. Each of the Part I, Part II, and Part III subjects consists of the equivalent of four single unit topics. For Mathematics I, there is no choice of topics; for Mathematics II A, II B, III A and III B there is a wider choice. No topic may be counted twice in making up distinct subjects. (Students who passed some mathematics subjects before this arrangement of subjects was introduced should consult the "transition arrangements" set out on p. 135 of the 1970 Faculty of Arts handbook, and p. 36 of the 1973 Faculty of Mathematics handbook. Note that the "code letters" for the topics may vary slightly from year to year.)
The subject Computer Science II is taught and examined jointly by the Departments of Electrical Engineering and Mathematics. There is no choice of topics.
Students should take particular note of Clause 14(3)(b) of the regulations for the degree of Bachelor of Science which states that not more than four mathematics subjects may be counted.

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

Part I Subject

661100 Mathematics I

Prerequisites
Nil

Hours
4 lecture hours and 2 tutorial hours per week

Examination
Two 3-hour papers

Content
Topics: AL — Algebra
AN — Real Analysis
CA — Calculus
SC — Statistics and computing

Part I Topics

Algebra (Topic AL) — W. Brisley

Prerequisites
Nil

Hours
1 lecture hour and ½ tutorial hour per week

Content

Text
Brisley, W. A Basis for Linear Algebra (Wiley 1973)

References
Anton, H. Elementary Linear Algebra 2nd edn (Wiley 1977)
Kolman, B. Elementary Linear Algebra (Macmillan 1977)
Lebeck, H. Algebra for Scientists and Engineers (Wiley 1971)
Lipschutz, S. Linear Algebra (Schaum 1968)

Real Analysis (Topic AN) — J. G. Couper

Prerequisites
Nil

Hours
1 lecture hour and ½ tutorial hour per week

Content

Text
Nil

References
Apostol, T. Calculus Vol. I 2nd edn (Blaisdell 1967)
Spivak, M. Calculus (Benjamin 1967)

Calculus (Topic CA) — W. P. Wood

Prerequisites
Nil

Hours
1 lecture hour and ½ tutorial hour per week

Content

Text
Ayres, F. Calculus (Schaum 1974)
LIST OF MATHEMATICS PART II TOPICS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Corequisite or Prerequisite Topic</th>
<th>Part III Topic Requiring this Part II Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Mathematical Models</td>
<td>CO</td>
</tr>
<tr>
<td>B</td>
<td>Complex Analysis</td>
<td>CO</td>
</tr>
<tr>
<td>CO</td>
<td>Vector Calculus &amp; Differential</td>
<td>M, N, P, PD, Q, QRS, TC, Y, Z</td>
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<tr>
<td></td>
<td>Equations (Double topic)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Linear Algebra</td>
<td>P, T, X</td>
</tr>
<tr>
<td>E</td>
<td>Topic in Applied Mathematics</td>
<td>CO</td>
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<tr>
<td></td>
<td>e.g. Mechanics, Potential Theory</td>
<td></td>
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<tr>
<td></td>
<td>and Fluid Dynamics</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Numerical Analysis &amp; Computing</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Probability &amp; Statistics</td>
<td>R, ST, U, Y</td>
</tr>
<tr>
<td>I</td>
<td>Applied Probability and Statistics</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Topics in Pure Mathematics</td>
<td>FM, O, T, X</td>
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<tr>
<td></td>
<td>e.g. Group Theory</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Analysis of Metric Spaces</td>
<td>FM, O, P, V, W</td>
</tr>
<tr>
<td>ML</td>
<td>Introduction to Computer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Architecture and Assembly Language</td>
<td></td>
</tr>
<tr>
<td>SI</td>
<td>Introduction to Structuring of Information</td>
<td></td>
</tr>
<tr>
<td>SP</td>
<td>Systematic Programming</td>
<td></td>
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</tbody>
</table>

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

Cost

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 III.

662200 Mathematics IIB

Prerequisite

Mathematics I

Hours

4 lecture hours and 2 tutorial hours per week

Examination

Each topic is examined separately

Cost

Four topics chosen from A to H, 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 I, SP, K or L may be included.

662300 Mathematics IIC

Prerequisite

Mathematics I

Pre- or Corequisite

Mathematics IIA
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. Students who may wish to proceed to Statistics III as a Part III subject should select topic I. 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 HB 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 IIA 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.

Texts for Part II Topics
For further details see Faculty of Mathematics Handbook.

662101 Topic A — Mathematical Models
Nil

662102 Topic B — Complex Analysis

662109 Topic CO — Vector Calculus and Differential Equations
Either
Greenberg, M. D. Foundations of Applied Mathematics (Prentice-Hall 1978)

662104 Topic D — Linear Algebra
Lipschutz, S. Linear Algebra (Schaum 1974)

662201 Topic E — Topic in Applied Mathematics
e.g. Mechanics, Potential Theory and Fluid Dynamics
Nil

662202 Topic F — Numerical Analysis and Computing
Nil

662204 Topic H — Probability and Statistics
Holl, P. G. Introduction to Mathematical Statistics 4th edn (Willey 1971)

662301 Topic I — Applied Probability and Statistics

662303 Topic K — Topic in Pure Mathematics
e.g. Group Theory
Nil

662304 Topic L — Analysis of Metric Spaces
Giles, J. R. Analysis of Metric Spaces (University of Newcastle 1974)

662405 Topic ML — Introduction to Computer Architecture and Assembly Language
Processor Handbook (PDP-11) 03/34/45/55/60 Digital Equipment Corporation

662401 Topic SI — Introduction to Structuring of Information
Nil

662402 Topic SP — Systematic Programming
Grogono, P. Programming in PASCAL 2nd edn (Addison-Wesley 1980)
Part III Subjects

The Mathematics Department offers two Part III Mathematics subjects, each comprising four topics chosen from the list below and the subject Statistics III. Pases in both Mathematics IIIA and IIC are prerequisite for entry to Mathematics IIIA. It will be assumed that students taking a Part III subject in 1982 have already studied topics CO, D, K and L in 1978 to 1981 (or C, D, E, K and L 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>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM</td>
<td>K, L, O</td>
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<tr>
<td>GT</td>
<td>O</td>
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<tr>
<td>M</td>
<td>CO</td>
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<tr>
<td>N</td>
<td>CO</td>
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<tr>
<td>O</td>
<td>K, L</td>
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<tr>
<td>P</td>
<td>CO, D, L</td>
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<tr>
<td>PD</td>
<td>CO</td>
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<td>PL</td>
<td>CO</td>
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<td>Q</td>
<td>CO</td>
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<td>QRS</td>
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<td>R</td>
<td>H</td>
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<td>S</td>
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<td>ST</td>
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<td>T</td>
<td>D, K</td>
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<td>TC</td>
<td>CO, F</td>
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<td>X</td>
<td>D, K</td>
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<tr>
<td>Y</td>
<td>CO, H</td>
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<tr>
<td>Z</td>
<td>CO, D, †</td>
</tr>
</tbody>
</table>

Some topics may be offered in alternate years.

In 1982 Topic F will probably be an additional prerequisite.

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

663100 Mathematics IIIA

Prerequisites: Mathematics IIIA & IIC

Hours: 4 lecture hours and 2 tutorial hours per week

Examination: Each topic is examined separately

663300 Statistics III

Prerequisites: Mathematics IIIA & IIC (including topics CO, H and I)

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, Q, QRS, ST, U, R), and at least one from the set (S, X, T, V, W). 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. In addition, students taking this subject will be required to complete an essay on a topic chosen from the history or philosophy of Mathematics. Students should consult members of the academic staff regarding their choice of topics.

663210 Topic FM — Foundations of Mathematics

Enderton, H. B. _Elements of Set Theory_ (Academic 1977)

663134 Topic GT — Applied Graph Theory

Nil

663101 Topic M — General Tensors and Relativity

Nil

663102 Topic N — Variational Methods and Integral Equations

Nil

663103 Topic O — Mathematical Logic and Set Theory

Notes available from the Department of Mathematics.

663104 Topic P — Ordinary Differential Equations

Nil

663108 Topic PD — Partial Differential Equations

Nil

663211 Topic PL — Programming Languages and Systems

Nil

663105 Topic Q — Fluid Mechanics

Nil
RESEARCH IN THE FACULTY OF SCIENCE
DEPARTMENT OF BIOLOGICAL SCIENCES

Current experiments in the field of mammalian reproduction involve assessing the interactions between spermatozoa and ova during fertilization in mammals and also the induced fusion of human spermatozoa with rodent ova. The differentiation of the cleaving mouse embryo is also being studied together with the interaction of the embryo with the uterus at the time of implantation. The biology of spermatozoa and comparative structure and function of the vertebrate epididymis.

Current research efforts involve studies of the enzymology, biochemistry and surface properties of uterine decidual cells during early pregnancy. Elucidation of the nature of the stimulus responsible for the induction of the decidual cell reaction is a prime objective of the research.

Cell-free system analyses of the translational efficiencies of various uterine messenger RNA molecules are currently being developed in order to increase our understanding of biochemical and molecular events occurring in the uterus during implantation of the conceptus.

Within the field of immunological influences on fertility, the following topics are currently under investigation: the radioimmunoassay of antibodies to LDH-X in sera from infertile and vasectomized men; the detection of antispermatozonal antibodies; the isolation and characterization of human spermatozoal auto- and iso-antigens.

The correlation between HLA antigens and hepatitis B virus carrier status is being studied.

In a study on a hypothesis on the initiation of cancer, histones H1 are being compared in chromatin from normal and malignant cells.

Investigation into infertility in humans resulting from auto- and isoimmunity to spermatozoa. Development of a radioimmunoassay technique for detection of antibodies to LDH-X in humans. The study of non-immunological spermatoglutinins in human sera.

Studies are being conducted on proteins of boar seminal plasma with a view to developing an effective method for the cryopreservation of boar semen.

Preservation by freezing of human spermatozoa for artificial insemination.

Reproductive biology of fish.

The topics under investigation in the field of population genetics include the effect of parental age on heritability of quantitative traits in different species of Drosophila and the development of selection indices based on factors affecting growth rates in swine.

A transmissible factor capable of inducing sterility in Drosophila is being studied.

The ecology and genetics of populations, geographic variation and hybrid zones in Lepidoptera are currently being studied.

The effects of fluorides upon plant communities and fluoride uptake and transfer within ecosystems.

The role of phytokarmines as regulators of long-distance carbon transfer and distribution within plants. Unloading of carbon from the phloem.

Strategies of phosphorus acquisition by and distribution within eucalypt seedlings growing under conditions of phosphorus limitation. The relationship between chloroplast ultrastructure and photosynthetic capacity in low light grown eucalypt seedlings.

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 interaction in protoplasts. Chloroplasts are being examined as possible vehicles for genetic change in plants.
DEPARTMENT OF CHEMISTRY

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

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.

Aliphatic, Aromatic and Heterocyclic Chemistry (Associate Professor L. A. Summers)
Synthesis, with particular reference to the preparation of new fungicides and plant growth regulators and studies of their mode of action; mass spectral fragmentation of organic molecules.

Molecular Structure (H. R. Tietze)
X-ray structure determination of selected crystalline solids.

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

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

Metal Complexes (Associate Professor W. R. Walker)
Studies of interaction of metal ions (especially copper and zinc) with biologically important molecules such as purines and pyrimidines, both in vivo and in vitro; the role of copper in health and disease.

Natural Products (Associate Professor H. Duewell)
Elucidation of the components of Xanthorrhoea resin and the synthesis of related compounds. Pericyclic reactions, oxygen heterocycles.

Organic Reaction Mechanism (Associate Professor L. K. Dyall)
Studies on the mechanism of oxidation which involve a neighbouring group in a cyclization process; the chemistry of N-chloro compounds; reactions of nitrenes.

Organic Synthesis and Stereochemistry (Dr K. H. Bell)
Development of new synthetic reactions; synthesis of potential local anaesthetics and strong analgetics; chemical methods for determining absolute configurations.

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.

Surface Chemistry (Associate Professor G. Curtoys)
Absorption on solids from gaseous and liquid phases; structure, surface acidity, and catalytic properties of zeolites.

DEPARTMENT OF GEOLOGY

Carboniferous

Stratigraphy/Palaeontology
Carboniferous palaeographic 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. Engell)

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

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. St.J. Warne)

Economic Geology
Geochemistry and ore genesis, with a special emphasis on the study of sulphur isotope distributions in ore minerals. Current projects include sulphur isotope studies of copper and nickel deposits in Western Australia, Kuroko ores of Japan and base metal mineralization in New South Wales. (Dr P. K. Seecombe)

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

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

Igneous Petrology
Petrology of southwest Pacific island-arc intrusive rocks; petrology of alkaline igneous rocks of the Gunnedah region; geochemistry of Archean granitoids, Canada (Dr D. R. Mason)

Metamorphic Petrology
Mineralogy and geochemistry of low-grade metamorphic rocks, north of Newcastle, and Central Peru, South America; and the structure and metamorphism of rocks south-east of Mudgee, New South Wales. (Dr R. Offler)

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

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. Mooe)
DEPARTMENT OF PHYSICS

Broadly, the research interests of the 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 these areas 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 F. T. Bagnall)

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. Cleary)

The use of electron beams in surface studies is concerned principally with low energy electron diffraction (LEED) and Auger electron spectroscopy (AES). The use of these techniques is directed towards the study of the structure and composition of clean metal surfaces and the adsorption of other species thereon. In particular, one area of special interest is the initial stage 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.

Geophysics — Geomagnetic Pulslations (Associate Professor B. J. Fraser)

The time of occurrence, velocity, polarisation and direction of travel of hydromagnetic waves in an ionospheric duct is being extensively investigated. The phenomenon is studied at the surface of the Earth as geomagnetic pulsations recorded at Newcastle, Woomera, Launceston, Perth, Macquarie Island and Auckland.

Geophysics — Radar Meteor Studies (Associate Professor C. S. L. Keay)

Digital techniques employing high speed multiple micro-computers have been developed to enable signal processing to be carried out in real time. These and a new HF pulse transmitter, are being developed for a fully automated radar meteor detection system at a new field station established north of Newcastle, with communication to the campus by a radar relay link.

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 include the study of the electronic properties of dilute substitutional and interstitial impurities in both simple and transition metal hosts. The energetics and diffusion of hydrogen impurities in nearly free electron and transition metal hosts are also being studied.

Internal Friction in Metals (Mr J. E. Cleary)

A project being carried out in collaboration with the Department of Metallurgy and concerned with the development of electronic equipment for measuring frictional loss of samples vibrating at constant amplitude.

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. Also analog IC techniques for simple solutions for 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 stereos.

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.

Cognitive Processes

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

Cross-Cultural Research

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

Developmental Psychology

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

Educational Psychology

A programme of research is being carried out on the social psychology of the classroom. In the programme the development of social skills, the social learning of isolated children and small group interaction are being studied.

Perception and Performance

The Perception and Performance Laboratory is currently conducting research in the areas of image processing, filtering, associative memory, models for reaction time and motion perception. New techniques for computer-assisted diagnosis of information-processing abilities are being investigated.

Transpersonal Psychology

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

Infant Perception

Research is currently examining various perceptual and attentional abilities in infants. The studies incorporate autonomic and electroencephalographic measures as well as the more usual behavioural measures.

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.

Mathematical Psychology

In mathematical psychology, experimental studies of new methods of measuring abilities and personality are continuing. Geometric and filtering approaches to the structure and processing of images and motion perception are of current interest, in conjunction with scaling procedures relevant to the analysis of perceptual data. Work on stochastic models for reaction time is also being carried out.

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 parameters of the cardiac response during a range of behaviours, e.g., aversive conditioning, open field activity, are being investigated using biofeedback and telemetric devices. The infrahuman subjects effects of early experience on adult behaviour are being examined.

Neuropsychology

Developmental norms for evoked responses and other electrophysiological measures are being established for children of primary school age. Cerebral laterisation of response is the focus of interest. Studies in progress include the electrophysiology of post-concussive states, validation of neuro-psychological tests, event-related potentials in linguistic and other complex stimulation schedules and evoked potential indices of stereopsis using random-dot patterns.
DEPARTMENT OF GEOGRAPHY

Biogeography
Altitudinal gradation of rainforest at Barrington Tops. Vegetation on lime-rich rocks of the Upper Hunter (J. C. Turner)

Climate
Microclimatology in vineyards (G. N. McIntyre)

Air pollution on a meso and micro scale; solar radiation; climatic change (H. A. Bridgman)

Development Geography
The economic development of less developed countries, with specific reference to the role of forestry production (W. J. A. Jonas)

Impact of a High Yielding Varieties Package on a Malay rice producing community, Kedah, Malaysia (R. E. Barnard)

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

Assessment in Geography (P. G. Irwin)

Time-space and socio-technical systems, with particular emphasis on shiftwork systems (K. W. Lee)

DEPARTMENT OF MATHEMATICS

Algebra
Associate Professor W. Brisley is working on some problems in group theory which arise from graph theory, and also on some applications of algebra to data-processing problems.

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

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

Chemical Kinetics
Dr D. L. S. McElwain is working on the mathematical modelling of nonequilibrium phenomena in gases, using the Master Equation approach.

Combinatorial Theory and Operations Research
Dr R. B. Eggleton is interested in all aspects of combinatorial mathematics, particularly graph theory.

Professor R. W. Robinson is applying combinatorics to the counting of various structures, such as graphs and search trees.

Dr R. J. Vaughan is interested in the application of optimisation methods to industrial production problems.

Associate Professor W. D. Wallis is carrying out research on block designs and arrays and graph theory.

Computer Science and Numerical Analysis
Dr D. W. E. Blatt is working on models of programme referencing behaviour and studying performance of memory management systems. He is also developing concurrent programming systems and techniques for writing software for multiprocessor systems. In addition, he is interested in analysis of algorithms and computational complexity, and the development of programming languages and systems.

Associate Professor A. J. Gottmann is interested in methods of function approximation, particularly from the viewpoint of using a differential equation representation. He is also interested in the analysis of theoretical and experimental data.

Dr W. Summerfield is working on ways of determining the “condition” of linear systems of equations. Further, he is interested in the solution by linear marching schema of ordinary differential equations, in particular “stiff” systems. He is also investigating the finite element method of solution for partial differential equations.

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

Dynamical Systems
Dr J. G. Cooper 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.

Dr R. J. Vaughan is investigating mathematical models in urban geography.

Associate Professor W. D. Wallis is working on mathematical models in urban geography, urban sociology and meteorology.

Fluid Mechanics
Associate Professor A. J. Gottmann 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 particular area of the geometry of Banach spaces, and interest is focused on various smoothness and rotundity properties of the norm and their implications for the space. This work is being generalised to a study of differentiation of convex functions on Banach spaces. Particular attention is being given to characterising Banach spaces where the continuous convex functions have various differentiability properties.

Dr V. Ficker and Mr 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 working on Greek algebra.

Information Theory
Professor R. G. Keats and Dr A. J. Dobson are continuing to work in cooperation with research scientists at the Defence Research Centre at Salisbury, S.A. Current work is concerned with processing clipped data from a number of receivers arrayed in various geometric patterns.

Integral Geometry
Dr T. K. Sheng studies the power of distances between random points in convex and non-convex regions in IR
Lexicostatistics
Dr A. J. Dobson studies the historical and geographical relationships between languages by statistical analysis of their vocabularies. Stochastic models of language evolution are developed.

Mathematical Biology
Dr D. L. S. McElwain is developing mathematical models of biological systems including solid tumours, transporting epithelia and leukocyte chemotaxis.

Mathematical Models of Tumour Growth
Dr D. L. S. McElwain is investigating models for the growth of solid isolated tumours.

Medical Statistics and Epidemiology
Dr A. J. Dobson and Dr R. W. Gibberd collaborate with the Faculty of Medicine to investigate various problems in epidemiology and biostatistics. Current research includes: regional variations in mortality and morbidity; age and sex-specific death rates from ischaemic heart disease in Australia; collection and analysis of data from the Hunter Valley Heart Attack Study; design and analysis for a survey of smoking habits of schoolchildren and the evaluation of an intervention programme; validation of routinely collected data on ischaemic heart disease; spatial behaviour of hospital patients in the Hunter Region.

Number Theory
Dr R. B. Eggleton is interested in number theory, particularly in combinatorial aspects of the subject.

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.

Problems in Biostatistics
Mathematical problems arising from analysis of epidemiological data are investigated theoretically. For example, Mrs D. O'Connell and Dr A. J. Dobson are studying measures of agreement between judges.

Statistical Mechanics
Associate Professor C. A. Croxton is working on the statistical mechanics of liquids, polymers and liquid interfaces. Associate 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. Associate Professor A. J. Guttmann and Dr J. S. Reeve are using renormalisation group methods to study the critical behaviour of systems with free surfaces.

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

Subject Computer Numbers for the B.Sc. Degree Course
The subjects selected should be written on the enrolment form in the following manner.

<table>
<thead>
<tr>
<th>Computer Number</th>
<th>SUBJECT NAME</th>
<th>Computer Number</th>
<th>NAMES OF COMPONENTS</th>
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<td>Biology I</td>
<td>71201</td>
<td>Biochem. &amp; Molecular Genetics</td>
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<td>721100</td>
<td>Chemistry I</td>
<td>71202</td>
<td>Cell Biology</td>
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<td>351100</td>
<td>Geography I</td>
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<td>712201</td>
<td>Comparative Struct. &amp; Function</td>
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<td>722300</td>
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<tr>
<td>662000</td>
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<td>(Not offered in 1982)</td>
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<tr>
<td>742200</td>
<td>Electronics &amp; Instrumentation II</td>
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3 Topics chosen from those listed below:

352302    Topic L - Advanced Climatology
352304    Topic O - Biogeography
352305    Topic P - Advanced Economic Geography
352306    Topic Q - Advanced Urban Geography
353209    Topic T - Southeast Asia
353211    Topic V - Explanation in Geography
4 copies chosen from:

- Topic FM — Foundations of Mathematics
- Topic GT — Applied Graph Theory
- Topic M — General Tensors and Relativity
- Topic N — Variational Methods & Integral Equations
- Topic O — Mathematical Logic & Set Theory
- Topic P — Ordinary Differential Equations
- Topic Q — Partial Differential Equations
- Topic PL — Programming Languages & Systems
- Topic S — Fluid Mechanics
- Topic R — Theory of Statistics
- Topic T — Geometry
- Topic ST — Sampling Theory
- Topic TC — Group Theory
- Topic U — Theory of Computing
- Topic V — Regression, Design & Analysis of Experiments
- Topic W — Measure Theory & Integration
- Topic X — Rings & Fields
- Topic Y — Theory of Probability
- Topic Z — Mathematical Principles of Numerical Analysis