The University of Newcastle Calendar consists of the following volumes:

- Volume 1 — Legislation
- Volume 2 — University Bodies and Staff
- Volume 3 — Faculty of Architecture Handbook
- Volume 4 — Faculty of Arts Handbook
- Volume 5 — Faculty of Economics and Commerce Handbook
- Volume 6 — Faculty of Education Handbook
- Volume 7 — Faculty of Engineering Handbook
- Volume 8 — Faculty of Medicine Handbook
- Volume 9 — Faculty of Science and Mathematics Handbook

Also available are the Undergraduate Guide and Postgraduate Prospectus.

This volume is intended as a reference handbook for students enrolling in courses conducted by the Faculty of Science and Mathematics.

The colour band, Topaz BCC4, on the cover is the lining colour of the hood of Bachelors of Science of this University. The colour band, Amethyst BCC 28, in the center of the cover is the lining colour of the hood Bachelors of Mathematics of this University.

The information in this Handbook is correct as at lst November, 1988.

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THE DEAN'S FOREWORD

Welcome to the new Faculty of Science and Mathematics. In the process of restructuring the management of the University, the Faculty of Mathematics has been dissolved and the Department of Mathematics has now been joined with the Faculty of Science into a newly named Faculty of Science and Mathematics. Mathematics students need have no fears about this rearrangement. They will not be disadvantaged by the change and the new faculty will continue to offer and administer the relevant degrees of the former faculties. The enlarged size of this Handbook bears strong testimony to the truth of that statement. Students will continue to have access to Computer Science and Statistics even though these subjects will now be administered by other faculties. In the role of Dean of Science, I offer a very warm welcome to the staff and students of the Department of Mathematics and seek their active cooperation under our new banner.

To the newly arriving students in Science and Mathematics may I offer a little advice. The system of instruction at university is vastly different from that in secondary schools. The onus is placed on the student to extract the maximum benefit from the course. University staff will lecture to you and during that time you are expected to make notes about the material being discussed. Some students respond by trying to take down the lecture verbatim but without understanding, others listen and make notes in outline form, copying down quotations or blackboard material, while a minority, overwhelmed by the volume and complexity of the subject matter, simply contemplate their next social engagement to their own disadvantage. Two things are important here. The first is the development of an efficient system of note-taking and in this field the Student Counselling Unit provides short courses. The second is that, apart from final examinations, no one follows up your comprehension of the lecture material other than yourself. The faculty expects you to spend at least one hour of your own time on private study for every contact hour that you have with University staff. You need to allocate this time from the very beginning of your course and if you delay in starting, then the amount of time needed to catch up with your subjects will increase proportionately. A well planned, uniform programme of work to support your lectures, tutorials and laboratory classes will allow you the time to develop your understanding of the subjects and enjoy the many other facets of university life.

If this University has a heart it must surely reside in the Auchmuty Library. The quality of your tertiary education depends upon your ability to make efficient use of this vital facility. Make sure you take part in the orientation programmes which the Library staff offer at the beginning of every year. Throughout your course the teaching staff of the University are here to guide you along the path of self-education and if you need assistance it is available at a number of levels. Difficulties with particular subjects should be discussed with the lecturer concerned or the Year Supervisor in the relevant Department. Problems with your degree structure and progression are the province of the Dean and Sub-Deans who will provide guidance when required. Day to day changes in your current enrolment are handled by the Faculty Secretary who can be found in the Student Administration Office.

In a climate when government charges for tertiary education are set to rise steeply, you must make the most of your time at University by using its resources to the full. Learn to organize your thoughts, expand your mind, and develop your critical faculties to the utmost in order to provide yourself with qualifications which will lead to a successful and satisfying career.

BRIAN A. ENGEL
Dean
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FACULTY INFORMATION

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

Information for New Undergraduates

Students embarking on a university course for the first time may find some difficulty in adapting to the new environment. Tertiary education makes a number of demands on students: it requires them to be self-disciplined, organized, self-motivated and moreover, responsible for their own course of study. Hence it is important that students become familiar with the University structure, degree courses offered and service organizations (such as the University Counselling Service & Accommodation Service) which offer assistance with study, personal and housing problems.

Often students on first entering University are not certain of their final field of interest. In fact, it is usually only after the completion of the first year of study that many students finally choose to major in a particular subject. In order to maintain flexibility first year subjects (PART I subjects) should be chosen from areas where the student has some previous expertise or special interest. At the same time, they should take note of the degree requirements, particularly with regard to compulsory subjects, advisory/ compulsory prerequisites and corequisites as set out in the appropriate degree/diploma regulations in this handbook.

Students should note that degrees must be structured to include at least two PART III subjects. For example, a Bachelor of Science degree may include a PART III Physics subject and a PART III Mathematics subject. Subject to the Dean’s permission, a candidate for the degree of Bachelor of Science is, in general, permitted to enrol in a subject from amongst those offered by another Faculty and in special circumstances may enrol in up to three subjects from another Faculty. Similarly, a candidate for the degree of Bachelor of Science (Psychology) may count up to two subjects offered in other degree courses and a candidate for the degree of Bachelor of Mathematics may enrol in up to four subjects from another Faculty.

Time limits are set on the duration of an undergraduate course as indicated in the appropriate regulations. Maximum workloads are also preset, since limits are placed on the number of subjects students are permitted to undertake in any one year. For information on these restrictions consult the appropriate degree regulations.

Advice

Students requiring specific advice on the selection or content of subjects in the course should seek help from members of the Faculty. In particular, advice should be sought from first, second and third year subject co-ordinators in each department, Heads of Departments, the Sub-Deans or Dean.

Enquiries regarding enrolment, variation to programme and general administrative problems should be directed to the Faculty Secretary, McMullin Building.

For personal counselling and study skills training it is suggested that students should consult the University Counselling Service.

Student Participation in University Affairs

Provision is made for students to be elected as members of Departmental and Faculty boards as well as to other University bodies. Elections of student members usually take place early in first term and students should watch Departmental notice boards for details of election of student members.

The Faculty Board of the Faculty of Science and Mathematics has provision for the election of four student members.

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. Science and Mathematics students taking subjects from other faculties must examine the timetable to ensure that clashes do not exist in their proposed courses.

Role of Faculty Board, Faculty of Science and Mathematics

The role of the Faculty of Science and Mathematics is defined by By-Law 2.4.4, which states:

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

(a) encourage and supervise the teaching and research activities of the Faculty;
(b) determine the nature and extent of examining in the subjects in the courses of study for the degrees and diplomas in the Faculty;
(c) determine the grades of passes to be awarded and the conditions for gaining 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 Council under By-Law 5.9.1;
(f) deal with any matter referred to it by Senate;
(g) make recommendations to Senate on any matter affecting the Faculty;
(h) exercise other powers and duties as may from time to time be delegated to it by the Council”.

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 requires that students shall pass at least four subjects at the end of the first two years of full-time attendance or four years of part-time attendance.

3. The Faculty Board has determined that a student who fails a subject twice shall be excluded from further enrolment in the Faculty, in each case unless he shows cause to the satisfaction of the Faculty Board why he should be permitted to do so.

4. Notwithstanding paragraphs 1, 2 and 3, above, the Faculty Board may review the academic progress of student in the later years of the course.

5. Students should note that a terminating pass can be awarded only for a Part I or Part II subject and that no more than two terminating passes may be awarded in a student’s programme (with no more than one at Part II level).

Advisory Prerequisites for Entry to the Faculty

There are no prescribed prerequisites for entry to the Faculty of Science and Mathematics; students are advised that lectures will commence on the assumption that all students will have achieved the level indicated below.

Subject | Advisory prerequisites
--- | ---
Biology I | Higher School Certificate Chemistry or 4-unit Science is appropriate and students are advised to include Chemistry I in their University programme.
Chemistry I | At least Mathematics (2-unit course), Chemistry (2-unit course), and Physics (2-unit course), with ranking in the top 50% in each case.
Geology I | 2-units of Science (preferably Chemistry) and at least 2-units of Mathematics.
Mathematics IS | Mathematics (2-unit course).
Mathematics I | Mathematics at 3-unit level with a score of at least 110/150 in 3-unit.
Physics IA | Students completing HSC in 1989 are strongly advised not to enrol in Physics IA in 1989 unless they have a Board of Secondary Education aggregate of at least 360 (corresponding UCAC mark
Mathematics Courses

Mathematics courses are currently offered under the degree regulations as in previous handbooks for those students who had enrolled in previous years. Students should note that it is possible, in the Bachelor of Mathematics degree course, to do complete major sequences in Mathematics and Computer Science, or in Mathematics and Statistics, as well as combining Mathematics with another discipline, as set out in the Regulations.

Transition Arrangements

The subject and topic prerequisites which apply to various subjects in Mathematics are set out in this handbook. However, students who had enrolled in previous years should, before completing their enrolment, consult with the Dean and/or the Head of the Department of Mathematics if they are in doubt.

Degrees Which Include Mathematics Subjects

Mathematics subjects may be taken in any degree course in the University. Mathematics majors exist in the Faculty of Arts, Faculty of Economics and Commerce as well as this Faculty, and substantial amounts of Mathematics are required in the Faculty of Engineering. There are two major sequences in Mathematics. These are:

(i) Mathematics I, Mathematics IIA plus Mathematics IIC, followed by Mathematics IIIA.

(ii) Mathematics I, Mathematics IIA, Mathematics IIB.

A student wishing to specialise in Mathematics as a double major would take the sequence Mathematics I, Mathematics IIA plus Mathematics IIC, Mathematics IIIA plus Mathematics IIB plus Mathematics IIIB as five of the nine subjects for the degree.

Combined Degrees

As set out in the regulations, students of sufficient ability may take a Bachelor of Mathematics degree combined with another degree from this or another Faculty together, at a considerable saving in time compared with taking them sequentially. Details are set out later in these notes.

Choice of Subjects in the Bachelor of Mathematics Degree

The requirements for the Bachelor of Mathematics degree allow for up to four of the nine subjects to be chosen from the subjects offered in other degree courses. Subjects which have been approved in the past are listed below.

<table>
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<tr>
<th>Mathematics I</th>
<th>Chemistry I</th>
<th>Classical Civilisation I</th>
<th>Drama I</th>
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Facility Policy in Regard to Standing for Diploma Courses Completed at a CAE

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

Students who intend to proceed to a Diploma in Education should familiarise themselves with the prerequisites for units offered in the course. These prerequisites are stated in terms of subjects of the University of Newcastle. Applicants whose courses of study have included subjects which are deemed for this purpose to provide an equivalent foundation may be admitted to the Diploma course as special cases.

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

(a) Secondary:
- English
- History
- Social Science (Geography, Commerce, Social Science)
- Mathematics
- Science
- Modern Languages (French, German, Japanese)

(b) Primary

Prerequisites

For information about prerequisites, students are invited to contact the Faculty Secretary, Faculty of Education. This contact should be made in the early stages of a degree course.

For secondary methods students are advised to undertake a Part III subject in the main teaching area and a Part II subject in another teaching area. For primary method students are advised to undertake a Part II subject in one secondary teaching area, and a Part I subject in another secondary area.

Note:

Normally, 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.

Mathematics Education Subjects

Candidates for the degree of Bachelor of Mathematics intending a career in teaching may wish to include professional studies related directly to teaching in addition to, and concurrently with, the normal course of study in the second and third years by enrolling Mathematics Education II and Mathematics Education III, the contents of which are set out under Extraneous Subjects.

Professional Recognition

Graduates of the University of Newcastle enrolled in the Faculty of Science and Mathematics are recognized by a number of different professional societies depending on their degree majors.

Biology

The Australian Institute of Biology Incorporated was inaugurated in 1986. Its objectives are to represent the Biology profession in Australia, to promote education and research in Biology and to improve communication between Biologists of different disciplines. The Institute confers on its members a status similar to that for other Australian professional institutions. Membership grades are: Fellow, Member, Associate and Student. Members and Fellows are able to indicate this by the appropriate letters after their qualifications. Fellowship requires distinction in Biology and nomination from the existing membership. Membership requires a first or second class honours degree in Biology and three years relevant experience, or a pass degree with five years relevant experience, or a Masters degree with two years relevant experience, or a PhD. An Associate requires an appropriate pass degree or contribution to the advancement of Biology.

Chemistry

Graduates holding a Bachelor of Science (Honours) majoring in Chemistry, may join the Royal Australian Chemical Institute which has several categories of membership according to qualification and experience.

Geology

Graduates holding a Bachelor of Science (Honours) majoring 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 qualification and experience.

Mathematics

For employment as a Mathematician, graduates should have at least one major in Mathematics. An Honours degree is preferred by many employers. The profession is represented by the Australian Mathematical Society.

Physics

For employment as a physicist, students must have a minimum of an ordinary Bachelor of Science degree with a major in Physics. An honours degree in Physics or combined Physics/Mathematics would be preferred. Physics as a profession is represented by the Australian Institute of Physics. Membership is limited to graduates with a minimum of a major in Physics. The Australian Institute of Physics has a number of grades of membership which are related to experience as a physicist. There is a grade of membership for students currently working towards a degree. The Institute monitors courses in Physics at tertiary institutions and judges them in terms of suitability for admission to membership of the Australian Institute of Physics. The Institute also responds on behalf of physicists to matters relating to physicists and their role. There are no formal conditions for registration as a physicist.

Psychology

Graduates holding a Bachelor of Science majoring in Psychology (or a Bachelor of Science (Psychology)) may join the Australian Psychological Society. Membership normally requires a four year degree in psychology. Provision is also made for Student Subscribers and Affiliates.
SECTION THREE

UNDERGRADUATE DEGREE/DIPLOMA REGULATIONS

Undergraduate Diploma/Degrees offered in the Faculty of Science and Mathematics

Bachelor of Science
Bachelor of Science (Aviation)
Diploma of Aviation
Bachelor of Science (Psychology)
Bachelor of Mathematics

Regulations Relating to the Ordinary Degree of Bachelor of Science

1. General

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

2. Definitions

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

"course" means the total requirements prescribed from time to time; in conformity with the degree pattern as presented in Regulation 10 of these Regulations;

"degree" means the Faculty Board of the Faculty;

"Dean" means the Dean of the Faculty;

"Department" means the Department offering a particular subject and includes any other body so doing;

"Faculty" means the Faculty of Science and Mathematics;

"Faculty Board" means the Faculty Board of the Faculty;

"subject" means any part of the course for which a result may be recorded.

3. Admission and Enrolment

(1) A candidate's enrolment in any year must be approved by the Dean or the nominee of the Dean.

(2) A candidate may not enrol in any year in any combination of subjects which is incompatible with the requirements of the timetable for that year.

(3) Except with the permission of the Dean, a candidate shall not enrol in more than four subjects in any one academic year.

(4) A candidate may select up to three subjects from subjects prescribed as its corequisites.

4. Qualification for Admission to the Degree

To qualify for admission to the degree a candidate shall pass nine subjects presented for the degree, except to such extent as the Faculty Board may permit.

5. Subject

(1) To complete a subject a candidate shall attend such lectures, tutorials, seminars, laboratory classes and field work and submit such written or other work as the Department shall require.

(2) To pass a subject a candidate shall complete it and pass such examinations as the Faculty Board shall require.

6. Standing

(1) The Faculty Board may grant standing in specified and unspecified subjects to a candidate, on such conditions as it may determine, in recognition of work completed in this university or another institution.

(2) A candidate may not be granted standing in more than four subjects which have already been counted towards a degree to which the candidate has been admitted or is eligible for admission provided that in no circumstances shall such standing enable the degree to be completed otherwise than in conformity with the degree pattern as presented in Regulation 10 of these Regulations.

(3) Notwithstanding anything hereinbefore contained, a candidate who has satisfied all the requirements of the course leading to the award of the Diploma in Aviation Science of the University shall be granted standing in all subjects passed in that course.

7. Prerequisites and Corequisites

Except with the permission of the Faculty Board, no candidate may enrol in a subject unless that candidate has passed any subjects prescribed as its prerequisites at any grade which may be specified and has already passed or concurrently enrols in or is already enrolled in any subjects prescribed as its corequisites.

8. Withdrawal

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

(2) A candidate who withdraws from a course after the relevant date shall be deemed to have failed in that subject unless permission is given by the Dean to withdraw without penalty. The relevant date shall be:

(a) in case of a subject offered only in the first semester, the Monday of the 9th week of the first semester;
(b) in case of a subject offered only in the second semester, the Monday of the 9th week of the second semester;
(c) in case of any other subject, the Monday of the 3rd week of second semester.

9. Choice of Subjects

(1) The nine subjects presented for the degree shall include:

(a) no fewer than six subjects selected from the Schedule of Subjects to these Regulations;
(b) at least three of the following:

Aviation I, Biology I, Chemistry I, Computer Science I,

Geography I, Geology I, Mathematics I or Mathematics IS, Physics IA or Physics IB, and Psychology I;
(c) at least one Part III subject selected from those offered by the Departments of Biological Sciences, Chemistry, Geography, Geology, Physics and Psychology.

(2) A candidate may select up to three subjects from subjects offered in the course leading to other degree 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 IB;
(b) more than five subjects from any one Department;
(c) Psychology IIC if either Psychology IIA or Psychology IIIB is included;
(d) Geology IIC if either Geology IIIA or Geology IIIB is included;
(e) Psychology IIC if either Psychology IIIA 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.

10. Degree Pattern

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

<table>
<thead>
<tr>
<th>Part I subjects</th>
<th>Part II subjects</th>
<th>Part III subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) 4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>(b) 4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>(c) 5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>(d) in exceptional circumstances, with the permission of the Dean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

11. Results

The results obtained by a successful candidate in a subject shall be:

Terminating Pass, Pass, Credit, Distinction or High Distinction.

12. Time Requirements

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

13. Relaxing Provision

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

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

15. Admission to a Combined Degree Course:
(a) shall be subject to the approval of the Deans of the two Faculties;
(b) shall, except in exceptional circumstances be at the end of the candidate’s first year of enrollment for the ordinary degree; and
(c) shall be restricted to candidates with an average of at least credit level.

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

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

18. Science/Arts
To qualify for admission to the ordinary degrees of Bachelor of Science and Bachelor of Arts, a candidate shall complete all the requirements for the degrees of Bachelor of Science and all the requirements for the degree of Bachelor of Science other than those prescribed in Regulations 3(3) and 10, and shall pass fourteen subjects chosen from the Schedule of Subjects approved for the two degrees, provided that
(a) at least six subjects, including at least one Part III subject, shall be chosen from Group I of the Schedule of Subjects approved for the degree of Bachelor of Arts;
(b) at least six subjects, including at least one Part III subject and one Part II subject in a different department, shall be chosen from the Schedule of Subjects approved for the degree of Bachelor of Science, the Part III subjects selected to be from a department other than that offering the Part III subject mentioned in (a); and
(c) the maximum total number of Arts Part I subjects and Science Part I subjects shall not exceed six.

19. Science/Mathematics
(1) A candidate shall qualify for admission to the ordinary degrees of Bachelor of Science and Bachelor of Mathematics by passing fourteen subjects, as follows:
(a) five subjects, being Mathematics I, Mathematics IIC, Mathematics IIIA and another Part III subject chosen from the Schedule of Subjects approved for the degree of Bachelor of Mathematics;
(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 Dean of the Faculty of Science and Mathematics, 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 IIIA or Economics IIIIB;
(f) a candidate counting Geology IIC shall not be entitled to count either Geology IIIA or Geology IIIIB.

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

SCHEDULE OF SUBJECTS.

Subject Remarks, Prerequisites, Corequisites, Preparatory Subjects

Part I
Aviation I
Biology I
Chemistry I
Computer Science I

Prerequisite
Preparatory Subject
HSC
Mathematics at 2-Level Unit or higher

Geography I
Geology I
Mathematics I
Mathematics IIC
Physics I A
Physics I B
Psychology I

Part II
Aviation II
Aviation IIB
Biology IIA
Biology IIB

Prerequisite
Aviation I
Aviation I
Biology I
Biology I

1 Preparatory subjects are those which students are strongly advised to have completed before enrolling in the subject for which a preparatory subject is recommended.
2 Before enrolling in a Part II subject a candidate who intends proceeding to the honours degree should consult with the Head of Department.
3 Not being offered in 1989.
Regulations Relating to the Degree of Bachelor of Science (Psychology)

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

2. 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 (Psychology);

"Department" means the Department offering a particular subject and includes any other body so doing;

"Faculty" means the Faculty of Science and Mathematics;

"Faculty Board" means the Faculty Board of the Faculty;

"subject" means any part of the course for which a result may be obtained or may be specified;

"the University" means the University of Newcastle.

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

(2) There shall be three classes of honours: Class I, Class II and Class III. Class II shall have two divisions, namely Division I and Division II.

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

(2) A candidate who withholds 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 case of a subject offered only in the first semester, the Monday of the 9th week of the first semester;

(b) in case of a subject offered only in the second semester, the Monday of the 9th week of second semester;

(c) in case of any other subject, the Monday of the 3rd week of second semester.

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

6. Subject
(1) To complete a subject a candidate shall attend such lectures, tutorials, seminars, laboratory classes and field work as the Faculty may require.

(2) To pass a subject a candidate shall complete the examination as the Faculty Board shall require.

7. Enrolment
(1) A candidate's enrolment in any year must be approved by the Dean or the Dean's 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.

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

9. 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 in any one academic year.

10. Choice of Subjects
The ten subjects presented for the degree shall be chosen in accordance with the following provisions, namely:

(a) A candidate shall include:

(i) the subjects being Psychology I, Psychology II, Psychology III, Psychology IV, Psychology IVA, Psychology IVP or Psychology IV;

(ii) unless the Dean, after consultation with the Head of the Department of Psychology, otherwise permits in a particular case, at least two other Part I subjects, selected from the following:

Aviation I, Biology I, Chemistry I, Computer Science I, Cognitography I, Geology I, Mathematics I or Mathematics IS and Physics I or II.

(b) A candidate may select up to two subjects from those offered in courses leading to other degrees of the University with the permission of the Dean, who shall determine the classification of each subject as a Part I or Part II subject.

(c) A candidate may not present for the degree subjects which have previously been counted towards another degree or diploma obtained by the candidate, except to such extent as the Faculty Board may permit.

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

Part I

<table>
<thead>
<tr>
<th>Subject</th>
<th>Subject</th>
<th>Subject</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>psychology I</td>
<td>psychology II</td>
<td>psychology III</td>
<td>psychology IV</td>
</tr>
</tbody>
</table>

Part II

<table>
<thead>
<tr>
<th>Subject</th>
<th>Subject</th>
<th>Subject</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>psychology IVA</td>
<td>psychology IVP</td>
<td>psychology IB</td>
<td>psychology IVB</td>
</tr>
</tbody>
</table>

Part III

<table>
<thead>
<tr>
<th>Subject</th>
<th>Subject</th>
<th>Subject</th>
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</thead>
<tbody>
<tr>
<td>psychology II A</td>
<td>psychology II B</td>
<td>psychology IV A</td>
</tr>
</tbody>
</table>

Part IV

<table>
<thead>
<tr>
<th>Subject</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>psychology IVP</td>
<td>9 subjects including psychology II A or psychology IV B</td>
</tr>
</tbody>
</table>

Notes for students interested in the BSc(Psychology) degree

1. The Bachelor of Science degree with Honours in Psychology remains the preferred path for those who wish to complete a four-year Psychology course.

2. Students will not be permitted to transfer from Psychology IVP to Psychology IV, although the reverse may be permissible.
## Regulations Relating to the Degree of Bachelor of Science (Aviation)

### 1. General

These regulations prescribe the requirements for the degree of Bachelor of Science (Aviation) 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:

- "Board of Studies" means the Board of Studies in Aviation;
- "course" means the total requirements prescribed from time to time to qualify a candidate for the degree;
- "Dean" means the Dean of the Faculty;
- "degree" means the degree of Bachelor of Science (Aviation);
- "Department" means the Department offering a particular subject and includes any other body so doing;
- "Faculty" means the Faculty of Science and Mathematics;
- "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 shall be conferred as an ordinary degree only.

### 4. Admission and Enrolment

(1) A candidate's enrolment in any year must be approved by the Dean or the nominee of the Dean.

(2) A candidate may not enrol in any year in any combination of subjects which is incompatible with the requirements of the timetable for that year.

(3) Except with the permission of the Dean given only if the Dean is satisfied that the academic merit of the candidate so warrants:

(a) a candidate shall not enrol in more than four subjects in any one academic year;
(b) a candidate enrolling in four subjects in any one academic year shall not enrol in a Part III subject unless granted permission by the Dean.

### 5. Qualification for Admission to the Degree

To qualify for admission to the degree a candidate shall pass nine subjects prescribed in accordance with the provisions of Regulation 10 and 11 of these Regulations.

### 6. Subject

(1) To complete a subject a candidate shall attend such lectures, tutorials, seminars, laboratory classes and field work and submit such written or other work as the Department shall require.

(2) To pass a subject a candidate shall complete it and pass such examinations as the Faculty Board shall require.

### 7. Standing

(1) The Faculty Board may grant standing in specified and unspecified subjects to a candidate, on such conditions as it may determine after considering the recommendation of the Board of Studies, in recognition of work completed in this university or another institution.

(2) A candidate may not be granted standing in more than four subjects which have already counted towards a degree to which the candidate has been admitted or is eligible for admission provided that in no circumstances shall such standing enable the degree to be completed otherwise than in conformity with a degree pattern as prescribed in Regulation 11 of these Regulations.

### 8. Prerequisites and Corequisites

(1) Except with the permission of the Faculty Board granted after considering the recommendation of the Board of Studies, no candidate may enrol in a subject unless that candidate has passed any subjects prescribed as its prerequisites at any grade which may be specified and has already passed or concurrently enrols in or is already enrolled in any subjects prescribed as its corequisites.

(2) A candidate obtaining a Terminating Pass in a subject shall be deemed not to have passed that subject for prerequisite purposes.

### 9. 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 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.

### 10. Choice of Subjects

(1) The nine subjects presented for the degree shall include:

- (a) Aviation I, Aviation IIA, and Aviation III;
- (b) not fewer than six subjects selected from the Schedule of Subjects to the Ordinary Degree of Bachelor of Science;
- (c) at least two of the following:
  - Biology I, Chemistry I, Computer Science I,
  - Geography I, Geology I, Mathematics I or Mathematics IS, Physics I A or Physics IB and Psychology I;
- (d) at least one other Part II and one other Part III subject approved by the Dean.

(2) A candidate may select up to three subjects offered in courses leading to other degrees of the University, other than the ordinary degree of Bachelor of Science, with the permission of the Dean, who shall determine the classification of each subject as a Part I, Part II or Part III subject.

### 11. 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:

#### Part I subjects

<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>(b)</td>
<td>(c)</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

### 12. Results

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

### 13. Time Requirements

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

### SCHEDULE OF SUBJECTS

<table>
<thead>
<tr>
<th>Subject</th>
<th>Remarks, Prerequisites, Corequisites, Preparatory Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part I</td>
<td></td>
</tr>
<tr>
<td>Aviation I</td>
<td></td>
</tr>
<tr>
<td>Biology I</td>
<td></td>
</tr>
<tr>
<td>Chemistry I</td>
<td></td>
</tr>
<tr>
<td>Computer Science I</td>
<td></td>
</tr>
<tr>
<td>Geography I</td>
<td></td>
</tr>
<tr>
<td>Geology I</td>
<td></td>
</tr>
<tr>
<td>Mathematics I</td>
<td></td>
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<tr>
<td>Physics I</td>
<td></td>
</tr>
<tr>
<td>Psychology I</td>
<td></td>
</tr>
<tr>
<td>Psychology IIA</td>
<td></td>
</tr>
<tr>
<td>Psychology IIB</td>
<td></td>
</tr>
<tr>
<td>Computer Science II</td>
<td></td>
</tr>
<tr>
<td>Electronics &amp; Instrumentation II</td>
<td></td>
</tr>
</tbody>
</table>

#### Part II subjects

<table>
<thead>
<tr>
<th>Part II subjects</th>
<th>Remarks, Prerequisites, Corequisites, Preparatory Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparatory</td>
<td></td>
</tr>
<tr>
<td>Computer Science I</td>
<td></td>
</tr>
<tr>
<td>Physics I A or IB</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>Corequisite</td>
<td></td>
</tr>
<tr>
<td>Computer Science I</td>
<td></td>
</tr>
</tbody>
</table>

#### Part III subjects

<table>
<thead>
<tr>
<th>Part III subjects</th>
<th>Remarks, Prerequisites, Corequisites, Preparatory Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparatory</td>
<td></td>
</tr>
<tr>
<td>Computer Science I</td>
<td></td>
</tr>
<tr>
<td>Physics I A or IB</td>
<td></td>
</tr>
</tbody>
</table>

### 14. Relaxing Provision

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

1. General

These regulations prescribe the requirements for the Diploma in Aviation Science of the University of Newcastle and are made in accordance with the powers vested in the Council under the University, other than the ordinary degree of Bachelor of Science, with the permission of the Dean, who shall determine the classification of each such subject as a Part I or Part II subject.

2. Definitions

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

"Board of Studies" means the Board of Studies in Aviation;
"course" means the total requirements prescribed from time to time to qualify a candidate for the diploma;
"Dean" means the Dean of the Faculty;
"Department" means the Department offering a particular subject and includes any other body so doing;
"the Diploma" means the Diploma in Aviation Science;
"Faculty" means the Faculty of Science and Mathematics;
"Faculty Board" means the Faculty Board of the Faculty;
"subject" means any part of the course for which a result may be recorded.

3. Admission to Candidate

An applicant for admission to candidature for the diploma shall satisfy the requirements of the Regulations Governing Admission and Enrolment concerning undergraduate admission.

4. Enrolment

(1) A candidate's enrolment in any year must be approved by the Dean or the nominee of the Dean.
(2) A candidate may not enrol in any year unless the Dean is satisfied that the candidate has passed all prerequisites at any grade which may be specified and has passed already or concurrently enrolments in or is already enrolled in any subjects prescribed as its corequisites.
(2) A candidate obtaining a Terminating Pass in a subject shall be deemed not to have passed that subject for prerequisite purposes.

5. Qualification for Award of Diploma

To qualify for the award of the Diploma a candidate shall pass six subjects presented in accordance with the provisions of Regulation 10 and 11 of these Regulations.

6. Subject

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

7. Standing

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

8. Prerequisites and Corequisites

(1) Except with the permission of the Faculty Board granted after considering the recommendation of the Board of Studies, no candidate may enrol in a subject unless that candidate has passed any subjects prescribed as its prerequisites at any grade which may be specified and has passed already or concurrently enrolments in or is already enrolled in any subjects prescribed as its corequisites.
(2) A candidate obtaining a Terminating Pass in a subject shall be deemed not to have passed that subject for prerequisite purposes.

9. 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 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 case of a subject offered only in the first semester, the Monday of the 9th week of the first semester;
(b) in case of a subject offered only in the second semester, the Monday of the 9th week of second semester;
(c) in case of any other subject, the Monday of the 3rd week of second semester.

10. Choice of Subjects

(1) The six subjects presented for the Diploma shall include:
(a) Aviation I and Aviation II;
(b) no fewer than four subjects selected from the Schedule of Subjects to these Regulations; and
(c) at least one of the following:

11. Diploma Pattern

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

12. Results

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

13. Time Requirements

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

14. Award of Diploma

The Diploma shall be awarded in two grades, namely:
(a) Diploma in Aviation Science; and
(b) in cases where a candidate's performance has reached a level determined by the Faculty Board, Diploma in Aviation Science with Merit.

15. Relating 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.
### SCHEDULE OF SUBJECTS

<table>
<thead>
<tr>
<th>Subject</th>
<th>Remarks/Prerequisites, Corequisites, Preparatory Subjects</th>
<th>Part</th>
<th>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Geography I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Geology I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Mathematics I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Mathematics IS</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Physics IA</td>
<td>Only one of these two subjects may be taken</td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Physics IB</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Psychology I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Chemistry I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Chemistry IIA</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Chemistry IIIB</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
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<td>Computer Science II</td>
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<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Electronics &amp; Instrumentation II</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Aviation I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Aviation IIA</td>
<td>Prerequisite: Aviation I</td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Aviation IIB</td>
<td>Prerequisite: Aviation I</td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Biology I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Biology IIA</td>
<td>Prerequisite: Biology I</td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Biology IIB</td>
<td>Prerequisite: Biology I</td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Chemistry IIA</td>
<td>Prerequisite: Chemistry I</td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Chemistry IIB</td>
<td>Prerequisite: Chemistry I</td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Computer Science I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Computer Science IIA</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Computer Science IIB</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Physics I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Physics IIA</td>
<td>Prerequisite: Physics I</td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Physics IIB</td>
<td>Prerequisite: Physics I</td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Psychology I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Psychology IIA</td>
<td></td>
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</tr>
<tr>
<td>Psychology IIB</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Statistics I</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
<tr>
<td>Statistics II</td>
<td></td>
<td></td>
<td>Preparatory Subject: HSC Mathematics at 2-Unit level or higher</td>
</tr>
</tbody>
</table>

1. **Regulations Governing the Ordinary Degree of Bachelor of Mathematics**

1. These Regulations prescribe the requirements for the ordinary degree of Bachelor of Mathematics 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 programme of study 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 Mathematics;
- "Department" means the Department offering a particular subject and includes any other body so doing;
- "Faculty" means the Faculty of Science and Mathematics;
- "Faculty Board" means the Faculty Board of the Faculty;
- "Schedule" means a Schedule of Subjects to these Regulations;
- "subject" means any part of the course for which a result may be recorded or specified, provided that for the purpose of these Regulations, Mathematics IIB Part I and Mathematics IIB Part II shall together count as one subject.
- "Standing" means the Dean of the Faculty or another institution.
- "University" means any part of the course for which a result may be recorded or specified, provided that for the purpose of these Regulations, Mathematics IIB Part I and Mathematics IIB Part II shall together count as one subject.

3. **Enrolment**

1. A candidate's enrolment in any year must be approved by the Dean or the Dean's nominee.

2. A candidate may not enrol in any year in 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 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 and not more than one Part II subject in that year; and
   - (c) a candidate enrolling in three subjects in any one academic year shall not enrol in more than two Part III subjects in that year.

4. **Qualification for Admission to the Degree**

1. To qualify for admission to the degree a candidate shall pass nine subjects, including:

   - (a) Mathematics I, and at least two Part III subjects from Schedule A or B,
   - (b) at least one of Mathematics IIIA, Mathematics IIIB and Statistics III,
   - (c) at least five subjects from Schedule A, including at least two Part II subjects from that Schedule.

2. Up to four subjects from those offered in other degree courses in the University may, with the permission of the Dean, be counted as qualifying subjects for the degree. When approving a subject, the Dean shall determine whether it shall be classified as Part I, Part II or Part III.

5. **Subject**

1. To complete a subject a candidate shall attend such lectures, tutorials, seminars, laboratory classes and field work and submit such written or other work as the Department shall require.

2. To pass a subject a candidate shall complete it and pass such examinations as the Faculty Board shall require.

6. **Standing**

1. The Faculty Board may grant standing in specified and unspecified subjects to a candidate, on such conditions as it may determine, in recognition of work completed in this University or another institution.

2. Subjects to sub-regulation (1) a candidate may not be granted standing in more than four subjects.

3. A candidate who is an undergraduate enrolled for a different degree of the University may transfer enrollment to the degree of Bachelor of Mathematics with such standing as the Faculty Board deems appropriate.

7. **Prerequisites and Corequisites**

1. Except with the permission of the Faculty Board granted after considering any recommendation made by the Head of the Department, no candidate may enrol in a subject unless that candidate has passed all subjects prescribed as its prerequisites at any grade which may be specified and has passed or concurrently enrols in at least five subjects from Schedule A, including at least one of Mathematics I, Mathematics IIA and Mathematics IIB.

2. A candidate obtaining a Terminating Pass in a subject shall be deemed not to have passed that subject for prerequisite purposes.

8. **Withdrawal**

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

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 case of a subject offered only in the first semester, the Monday of the 9th week of the first semester;
   - (b) in case of a subject offered only in the second semester, the Monday of the 9th week of the second semester;
   - (c) in case of any other subject, the Monday of the 3rd week of second semester.

9. **Results**

The result obtained by a successful candidate in a subject shall be:

- Terminating Pass, Ungraded Pass, Pass, Credit, Distinction, or High Distinction.

10. **Time Requirements**

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

11. **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.

### Combined Degree Courses

#### 12. General

A candidate may complete the requirements for the degree in conjunction with another Bachelor degree by completing a combined degree course approved by the Faculty Board and also, where that other degree is offered by another Faculty, the Faculty Board of that Faculty.

**Admission to a Combined Degree Course**

1. A candidate shall be subject to the approval of the Dean or the Heads of the two Faculties as the case may be;

2. shall, except in exceptional circumstances, be at the end of the candidate's first year of enrollment in a degree;

3. shall be restricted to candidates with an average of at least credit level who have passed Mathematics I at a level deemed satisfactory by the Dean, or who have achieved a standard of performance deemed satisfactory for the purposes of admission to a combined degree course by the Faculty Board.

14. 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 Dean or the Dean's of the two Faculties as the case may be.

15. To qualify for admission to the two degrees a candidate shall satisfy the requirements for both degrees except as provided in the following Regulations.

16. **Mathematics/Arts**

1. To qualify for admission to the ordinary degrees of Bachelor of Arts and Bachelor of Mathematics, a candidate shall pass fourteen subjects which shall include:

   - (a) five subjects selected from Schedule A for the ordinary degree of Bachelor of Mathematics, of which at least two are Part III subjects from that schedule, and
   - (b) nine other subjects, chosen from the subjects listed in the Schedule of Subjects approved for the ordinary degree of Bachelor of Arts.

17. **Mathematics/Science**

1. To qualify for admission to the ordinary degree of Bachelor of Mathematics and Bachelor of Science, a candidate shall pass fourteen subjects as follows:

2. **Three Ordinary Degree of Bachelor of Mathematics Regulations**

...
(a) four subjects, being Mathematics I, Mathematics IIa, Mathematics IIc and Mathematics IIIa;
(b) one subject from the following, namely Mathematics IIIb, Computer Science III, Statistics III, or a Part III subject chosen from the Schedules of Subjects approved for the degree of Bachelor of Mathematics; and
(c) six subjects chosen from the other subjects listed in the Schedule of Subjects approved for the degree of Bachelor of Science; and
(d) three subjects, chosen with the approval of the Dean of the Faculty of Science and Mathematics, from the subjects approved for any of the degree courses offered by the University.

(1) 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 IIIC shall not be entitled to count either Psychology IIIA or Psychology IIIB;
(d) a candidate counting Psychology IIIC shall be entitled to count either Psychology IIIA or Psychology IIIB;
(e) a candidate counting Economics IIIC shall be entitled to count either Economics IIIA or Economics IIIB;
(f) a candidate counting Geology IIIC shall not be entitled to count Geology IIIA or Geology IIIB.

18. Mathematics/Commerce
To qualify for admission to the ordinary degrees of Bachelor of Commerce and Bachelor of Mathematics, a candidate shall pass seventeen subjects as follows:
(a) five subjects selected from Schedule A of the Regulations Governing the ordinary degree of Bachelor of Mathematics, of which at least two are Part III subjects from that schedule, and
(b) twelve subjects which shall by themselves satisfy the requirements for the degree of Bachelor of Commerce.

19. Mathematics/Engineering
To qualify for admission to the Ordinary degree of Bachelor of Mathematics and the degree of Bachelor of Engineering, a candidate shall pass:
(a) five subjects selected from Schedule A for the ordinary degree of Bachelor of Mathematics, of which at least two are Part III subjects from that schedule, and
(b) other subjects selected from the programme of subjects approved for the degree of Bachelor of Engineering (Mechanical), Bachelor of Engineering (Industrial), Bachelor of Engineering (Electrical), Bachelor of Engineering (Chemical), Bachelor of Engineering (Civil) or Bachelor of Engineering (Computer), totalling a minimum of 48 units as calculated for that degree.

20. Mathematics/Economics
To qualify for admission to the ordinary degree of Bachelor of Economics and Bachelor of Mathematics, a candidate shall pass seventeen subjects as follows:
(a) five subjects selected from Schedule A of the Regulations Governing the ordinary degree of Bachelor of Mathematics, of which at least two are Part III subjects from that schedule, and
(b) other subjects totalling a minimum of twelve points which shall by themselves satisfy the requirements for the degree of Bachelor of Economics.

21. Mathematics/Computer Science
(1) To qualify for admission to the ordinary degree of Bachelor of Mathematics and Bachelor of Computer Science, a candidate shall:
(a) pass fourteen subjects, and
(b) complete to the satisfaction of the Head of the Department of Computer Science an essay on some aspect of the history or philosophy of Computer Science or the social issues raised by computer technology.
(2) The fourteen subjects presented for the degree shall conform to the following requirements:
(a) Not fewer than seven subjects shall be selected from the Schedule of Subjects for the ordinary degree of Bachelor of Computer Science in accordance with paragraphs (b), (b)' and (c) of Regulation 4(2) of the Regulations governing that degree;
(b) Nine of the subjects shall be selected in accordance with Regulations 4(1)(b) and (c) and Regulation 4(2) of these Regulations;
(c) At least two Part III subjects shall be selected from the Schedule of Subjects for the ordinary degree of Bachelor of Computer Science; and
(d) At least two Part III subjects, being subjects not included in the Schedule of Subjects for the ordinary degree of Bachelor of Computer Science, shall be selected from the Schedule of Subjects to those Regulations.

22. Mathematics/Arkery
To qualify for admission to the Ordinary degree of Bachelor of Mathematics and the degree of Bachelor of Surveying, a candidate shall pass:
(a) five subjects selected from Schedule A to the Regulations Governing the Ordinary Degree of Bachelor of Mathematics, of which at least two are Part III subjects from that schedule, and
(b) other subjects selected from the programme of subjects approved for the degree of Bachelor of Surveying, totalling a minimum of 48 units as calculated for that degree.

SCHEDULES OF SUBJECTS

SECTION A
Bachelor of Mathematics

<table>
<thead>
<tr>
<th>Subject</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics I</td>
<td>It is assumed that students have studied Higher School Certificate Mathematics at the 2-unit level or higher. Nevertheless students who studied only two units Mathematics or who achieved less than 110 out of 150 in three unit Mathematics will find themselves seriously disadvantaged in this subject and should instead study the subject Mathematics IS followed by Mathematics 102 in the subsequent year.</td>
</tr>
<tr>
<td>Part I</td>
<td>Mathematics III</td>
</tr>
<tr>
<td>Mathematics II</td>
<td>Prerequisite Mathematics I</td>
</tr>
<tr>
<td>Mathematics IIc</td>
<td>Prerequisite Mathematics I</td>
</tr>
<tr>
<td>Corequisite Mathematics II A</td>
<td>Prerequisite Mathematics I</td>
</tr>
<tr>
<td>Mathematics IIIa</td>
<td>Prerequisite Computer Science I</td>
</tr>
<tr>
<td>Mathematics IIIb</td>
<td>Prerequisite Mathematics IIA and Mathematics IIC</td>
</tr>
<tr>
<td>Statistics IIIa</td>
<td>Prerequisite Mathematics IIA</td>
</tr>
<tr>
<td>Statistics IIIb</td>
<td>Prerequisite Statistics II</td>
</tr>
<tr>
<td>Computer Science IIIa</td>
<td>Prerequisite Computer Science II</td>
</tr>
</tbody>
</table>

SECTION B

<table>
<thead>
<tr>
<th>Subject</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics IS</td>
<td>This subject is for students who did not meet the requirement of Mathematics I in that they have taken less than 3-units of Mathematics or have achieved less than 110 out of 150 in 3-unit Mathematics at the Higher School Certificate level. Note that Mathematics IS needs to be completed with Mathematics 102 in the following year before further Mathematics subjects can be undertaken.</td>
</tr>
<tr>
<td>Part I</td>
<td>Mathematics 102</td>
</tr>
<tr>
<td>Mathematics 102</td>
<td>Prerequisite Mathematics IS. This is a half subject which together with Mathematics IS provides a sufficient prerequisite for second year Mathematics subjects. It is assumed that students have studied Higher School Certificate Mathematics at the 2-unit level or higher with either Multistrand Science at the 4-unit level or Physics at the 3-unit level and Chemistry at the 2-unit level.</td>
</tr>
<tr>
<td>Part II</td>
<td>Mathematics III</td>
</tr>
<tr>
<td>Mathematics IIIb</td>
<td>Prerequisite Mathematics I</td>
</tr>
<tr>
<td>Accounting ISC</td>
<td>Prerequisites Accounting I &amp; Mathematics I</td>
</tr>
<tr>
<td>Civil Engineering IIM</td>
<td>Prerequisites Engineering I &amp; Mathematics I</td>
</tr>
<tr>
<td>Psychology IIC</td>
<td>Prerequisites Mathematics I, Psychology I. A candidate counting Psychology IIC shall not be entitled to count Psychology IIIA or Psychology IIIB.</td>
</tr>
<tr>
<td>Computer Science I</td>
<td>Preparatory subjects: HSC Mathematics at 2-unit level or higher</td>
</tr>
<tr>
<td>Part II</td>
<td>Mathematics IIA</td>
</tr>
<tr>
<td>Mathematics IIB</td>
<td>Prerequisite Mathematics I, Prerequisite Mathematics I</td>
</tr>
<tr>
<td>Computer Science IIP</td>
<td>Prerequisite Computer Science I</td>
</tr>
<tr>
<td>Mathematics IIA</td>
<td>Prerequisites Mathematics IIA and Mathematics IIC</td>
</tr>
<tr>
<td>Mathematics IIIb</td>
<td>Prerequisite Mathematics IIA</td>
</tr>
<tr>
<td>Statistics IIIb</td>
<td>Prerequisite Statistics II</td>
</tr>
<tr>
<td>Computer Science IIIA</td>
<td>Prerequisite Computer Science II</td>
</tr>
</tbody>
</table>

1. Students who have passed both Mathematics IS and Mathematics IS02 will be considered as having satisfied prerequisite requirements of Mathematics I. Successful completion of Mathematics IS and Mathematics IS02 will count as one Part I Schedule A subject in lieu of Mathematics I.  
2. Transition arrangements for candidates enrolled in the course prior to 1995 will be determined in particular cases by the Faculty Board.  
3. The Dean should be consulted to ensure that the appropriate Statistics background material for Economics IS is covered.
Additional Regulations

The following regulations governing admission and enrolment have been abstracted from the Legislation Handbook.

Undergraduate Admission

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

(a) the Faculty Board or the Record of Failure Handbook and summarised in Additional Regulations.

(b) the Faculty Board or the Record of Failure Handbook and summarised in Additional Regulations.

(2) The aggregate of marks prescribed by the Senate shall be determined by aggregating the marks gained in up to 10 units having the highest marks.

Examination

A summary of the Regulations is included in the centre pages of this Handbook.

Unsatisfactory Progress

These Regulations are reprinted in the centre pages of this Handbook and summarised in Section Two.

Record of Failure

An applicant who has a record of failure at another tertiary institution shall not be admitted unless that applicant first satisfies (a) the Faculty Board or the Doctoral Degree Committee for the Faculty as appropriate, in the case of a postgraduate qualification; or
(b) the Admissions Committee, in the case of any other qualification;

that there is a reasonable prospect that the applicant will make satisfactory progress.

Enrolment

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

(a) satisfy appropriate Diploma/Degree Regulations as set out in Section Three;

(b) receive approval to enrol;

(c) complete the prescribed enrolment procedures; and

(d) pay any fees and charges prescribed by the Council.

An applicant may be admitted under such conditions as the

Admissions Committee may determine after considering any advice offered by the Dean of the Faculty.

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

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

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

Enrolment Status

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

Non-Degree Students

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

Re-enrolment

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

Limit on Admission

Where the Council is of the opinion that a limit should be placed upon the number of persons who may in any year be admitted to a course or part of a course or to the University, it may impose such a limit and determine the manner of selection of those persons to be so admitted.

Combined Degree Courses

The decision to take a combined degree course is usually taken at the end of a student's first year in his original degree course, in consultation with the Deans of the Faculties responsible for the two degrees. Permission to embark on a combined degree course will normally require an average of credit levels in first year subjects.

Bachelor of Science and Another Degree

Science/Arts

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

(a) Year 1 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 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. 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 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 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 been passed. By the end of this year at least three subjects from the BSc Schedule of subjects must be passed.

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

Science/Engineering

See details in Faculty of Engineering Handbook.

Science/Mathematics

The details for this combined degree course follow simply from the requirements for each degree. Each degree requires nine subjects so the combined degree requires 18 subjects less four subjects for which standing may be given, thus the combined degree should contain 14 subjects.

Bachelor of Science and Another Degree

Mathematics/Arts

The details for this combined degree course follow simply from the requirements for each degree. Each degree requires nine subjects so the combined degree requires 18 subjects less four subjects for which standing may be given, thus the combined degree should contain 14 subjects.

Bachelor of Mathematics and Another Degree

Statistics III or a Schedule B subject from the requirements for Bachelor of Mathematics, plus two other subjects which will complete the requirements for the Bachelor of Science degree.

Bachelor of Mathematics and Another Degree

Mathematics/Arts

Statistics III or a Schedule B subject from the requirements for Bachelor of Mathematics, plus two other subjects which will complete the requirements for the Bachelor of Science degree.

Bachelor of Mathematics and Another Degree

Mathematics/Arts

Statistics III or a Schedule B subject from the requirements for Bachelor of Mathematics, plus two other subjects which will complete the requirements for the Bachelor of Science degree.
Mathematics/Economics
The details for this combined degree course in Mathematics and Economics follow simply from the requirements for each degree. The combined degree course should contain Mathematics I, Mathematics II, Mathematics III, Mathematics IIIA and one of Mathematics IIIIB, Computer Science IIIA, Statistics III or a Part III subject from Schedule B of the Schedule of Subjects approved for the degree of Bachelor of Mathematics, and all the subjects satisfying the requirements for the degree of Bachelor of Economics.

The course could be pursued in the following manner:

Year 1  Mathematics I
    Introductory Quantitative Methods
    Economics I
    One BEc subject

Year 2  Mathematics II
    Mathematics II A
    One BEc subject

Year 3  Mathematics III A
    Mathematics II A
    Economics II
    Two BEc subjects

Year 4  Mathematics III B, Computer Science III A,
    Statistics III or a Part III Schedule B subject from the requirements for the Bachelor of Mathematics
    degree.
    Two BEc subjects.

Year 5  Three BEc subjects

Mathematics/Engineering
BE/BMath in Chemical Engineering
BE/BMath in Civil Engineering
BE/BMath in Computer Engineering
BE/BMath in Electrical Engineering
BE/BMath in Industrial Engineering
BE/BMath in Mechanical Engineering

The details of the combined degree courses in Mathematics and Engineering follow simply from the requirements for each degree. The combined degree course would typically contain Mathematics I, Mathematics II, Mathematics III, Mathematics IIIA and one of Mathematics III B, Computer Science III A, Statistics III or a Part III subject from Schedule B of the Schedule of Subjects approved for the degree of Bachelor of Mathematics, and all the subjects satisfying the requirements for the degree of Bachelor of Engineering.

Candidates wishing to enrol in a combined degree should liaise with the relevant Head of Department and the Dean of the Faculty of Science and Mathematics concerning approved subjects. See the Faculty of Engineering Handbook for subject/unit descriptions.

SECTION THREE
ADDITIONAL REGULATIONS

SECTION FOUR

UNDERGRADUATE DEGREE SUBJECT DESCRIPTIONS

Guide to Undergraduate Subject Entries
Subject outlines and reading lists are set out in a standard format to facilitate easy reference. An explanation is given below of some of the technical terms used in this Handbook.

1. (a) Prerequisites are subjects which must be passed before a candidate enrolls in a particular subject.

(b) Where a subject is marked Advisory it refers to a pass in the Higher School Certificate. In such cases lectures will be given on the assumption that a pass has been achieved at the level indicated.

(c) Preparatory subjects are those which candidates are strongly advised to have completed before enrolling in the subject for which the preparatory subject is recommended.

2. Corequisites refer to subjects or topics which the candidate must either pass before enrolling the particular subject or be taking concurrently.

3. Under examination regulations "examination" includes mid-year examinations, assignments, tests or any other work by which the final grade of a candidate in a subject is assessed. Some attempt has been made to indicate for each subject how assessment is determined. See particularly the general statement in the Department of Mathematics section headed "Progressive Assessment" referring to Mathematics subjects.

4. Texts are books recommended for purchase.

5. References are books relevant to the subject or topic which need not be purchased.

Biological Sciences Subject Descriptions

71100  BIOLOGY I

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

Prerequisites Students intending to study in the biological sciences are advised that facility with Chemistry is desirable. HSC Chemistry or 4-unit Science is appropriate, and students are advised to include Chemistry I in their university programme. However, a series of 10 lectures in background chemistry will be offered during orientation week (20th to 24th February, 1989 between 10.00 a.m. and 12.00 noon each day in the Department of Biological Sciences lecture theatre, JLG01) for those students enrolling in Biology I who have done little chemistry. Attendance at the lectures is optional.

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

A compulsory two-day excursion will be held in the May vacation.

Examination Two three hour papers.

Content The course is organized into 3 Units over First and Second Semester.

UNIT 1
Cell Biology
Theme The evolution and functional organization of cells.
Topics
Biological molecules - the structure of proteins, carbohydrates and lipids.
Cell organization - emphasis on organelle ultrastructure and principal function.

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UNIT 2 Animal Diversity - Form and Function

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

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

UNIT 3 Genetics


Population Biology

An introduction to ecology, population genetics and evolution.

Texts
- Kesten, W.T. & Gould J.L. Biological Science 4th edn (Norton, 1986) or
- Curtis, H. Biology 4th edn (Worth, 1983)

References
- Ayala, F.M. & Kiger, J.A. Modern Genetics (Benjamin Cummings, 1984)
- Moodle, M.J. Facts from Figures (Penguin, 1984)
- Parker, R.E. Introductory Statistics for Biology (Edward Arnold, 1973)
- Rayle, D. & Wedberg, I., Botany: A Human Concern 2nd edn (Saunders College, 1980)
- Strickberger, M.W. Genetics 3rd edn (McGraw-Hill, 1985)

UNIT 4 Control of Plant Development.

Higher plant topics such as phyllotaxy, flower morphology and seedling development.

UNIT 5 Plant Diversity and Exploration.

Diversity as a consequence of adaptation for survival in a range of environments.

Topics
- Survival in a range of environments.
- Plant Diversity and Exploration.

UNIT 6 Biological Energy Processes - Photosynthesis, Cellular Respiration.

Fundamental processes peculiar to plant cells are examined. These include cell water relations, membrane transport of solutes, fixation of atmospheric carbon, and photosynthesis. Cellular regulation of the processes is emphasized.

Texts

UNIT 7 Population Dynamics.

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

Texts

References
- Recker, H., Lunney, D. & Dunn, I. A Natural Legacy (Pergamon (eds) Press, 1979)

UNIT 8 Molecular Genetics.


Texts

UNIT 9 Molecular Biology.

Molecular Biology of the cell (Garland Publishing, 1983)

References

UNIT 10 Plant Physiology.

Plant Physiology Content

Fundamental processes peculiar to plant cells are examined. These include cell water relations, membrane transport of solutes, fixation of atmospheric carbon, and photosynthesis. Cellular regulation of the processes is emphasized.
Chemistry Subject Descriptions

721100 CHEMISTRY I
Prerequisites Nil
Advisory Subjects At least Mathematics (2-unit course), Physics (2-unit course) and Chemistry (2-unit course) with ranking in the top 50% in each case.

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

Examination
One 3 hour examination held in the examination period after each semester. The final grade for the subject Chemistry 1 will be determined by performance in first and second semester. The laboratory mark counts 10% towards the final grading. A pass in the laboratory course is required in order to pass the subject.

Content
First Semester
Inorganic Chemistry (approx 16 lectures)
Revision of basic concepts.
Organic Chemistry (approx 22 lectures)
Historical development. The shapes, structures and names of organic compounds; reactions of common functional groups; synthesis, differentiation and structural elucidation of organic compounds.

Second Semester
Inorganic Chemistry (approx 14 lectures)
Periodic properties of the elements and their compounds; bonding and structure; co-ordination compounds.
Physical Chemistry (approx 25 lectures)
Chemical equilibria; thermodynamics; electrochemistry; chemical kinetics.

Texts
Aylward, G.H. & Findlay, T.J.V.
S.I. Chemical Data 2nd edn (Wiley, 1974)
Brown, W.H.
Introduction to Organic Chemistry 3rd edn (Wadsworth student edn)
Brown, T.L. & LeMay, H.E.
Chemistry - The Central Science 3rd edn. (Prentice-Hall, 1985)

722200 CHEMISTRY IIA
Prerequisite Chemistry I
Advisory Subjects Mathematics I or Mathematics IS & either Physics IA or IB
Hours 3 lecture hours and 6 hours of tutorial and laboratory classes per week.

Examination
Two 2 hour examinations held in the examination period after each semester. The final grade for the subject Chemistry IIA will be determined by performance in first and second semester. The laboratory mark counts 20% towards the final grading. A pass in the laboratory course is required in order to pass the subject.

CHEMISTRY SUBJECT DESCRIPTIONS

First Semester
Analytical Chemistry (approx 6 lectures)
General concepts, separation methods.
Inorganic Chemistry (approx 11 lectures)
Main group chemistry, transition metal chemistry and co-ordination complexes.
Physical Chemistry (approx 11 lectures)
Thermodynamics - basic laws to ideal and non-ideal systems.
Organic Chemistry (approx 11 lectures)
Aromatic Chemistry.
Laboratory Programme
Organic and Inorganic/Analytical.
Second Semester
Physical Chemistry (approx 11 lectures)
Dynamics kinetic; chemical affinity; electrochemical cells.
Organic Chemistry (approx 11 lectures)
Aromatic chemistry.
Inorganic Chemistry (approx 11 lectures)
Symmetry, structure and bonding, structure elucidation; pi acceptor complexes and organometallic compounds.
Analytical Chemistry (approx 6 lectures)
Selected instrumental methods.
Laboratory Programme
Physical and Analytical/Inorganic.

Texts
Akins, P.W.
Physical Chemistry 3rd edn (Oxford, 1982)
Basic Inorganic Chemistry 2nd edn (Wiley, 1987)
Fine, S.I., Hendrickson, et al
Also advisable, particularly if proceeding to Chemistry IIIA:
Shoemaker, D.P., Garland, et al
Christian, G.D. and O'Reilly, J.E.
Instrumental Analysis 2nd edn (Allyn & Bacon, Sydney, 1980)

Model Kit
Starkey, R.
Theta Model Set (Wiley, 1984)
OR
Lehman, J.W.
Molecular Model Set for Organic Chemistry (Allyn & Bacon, 1984)

722300 CHEMISTRY IB
Prerequisite Chemistry I
Advisory Subjects Mathematics I or Mathematics IS and either Physics IA or IB
SECTION FOUR

CHEMISTRY SUBJECT DESCRIPTIONS

Corequisite Chemistry II A
Hours 3 lecture hours and 4 laboratory hours per week and associated assignments.

Examination
Two hour examinations held in the examination period after each semester. The final grade for the subject Chemistry II B will be determined by performance in first and second semester. The laboratory mark counts 15% towards the final grading. A pass in the laboratory course is required in order to pass the subject.

Content
First Semester
Three topic units (each about 12 lectures) assigned by the Department from a group of options which include environmental chemistry, organic chemistry, applied inorganic chemistry, inorganic solids and non-aqueous systems, industrial organic chemistry, polymers, electrochemical technology, photochemistry and solid state chemistry. The course in each year will be listed in the department.

Laboratory Programme
Each of the units will be associated with its laboratory session and assignments.

Second Semester
Three topics (each about 12 lectures) drawn from the above list.

Laboratory Programme
As above.

Tests
To be advised

CHEMISTRY - PART III SUBJECTS

723100 CHEMISTRY III A
Prerequisites Mathematics I or Mathematics IS; Chemistry II A.

Hours
The two Part III subjects, offered by the Chemistry Department, each involve about 50 hours of lectures per semester. Associated with each subject are 8 hours per week of laboratory work.

Examination
About one hour per unit, generally organized as 2 hour papers in the examination period after each semester. Final grading in the subject Chemistry III A will be determined by the marks obtained in first and second semester. To pass the subject, students must achieve an acceptable aggregate mark and earn a pass grading in the specified laboratory programme. The laboratory mark counts 25% toward the final grading.

Content
Each student enrolling in Chemistry III A must select ten topics from the list provided by the Department.

Typical topic listings are:
- Principles of Analysis
- Basic Chemistry
- Coordination Chemistry
- Carboxylic Acids, Amino Acids, Nucleotides
- Predicting Reactivity in Organic Reactions
- Physical Methods in Inorganic Chemistry

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

First Semester
Five lecture units, each involving 10 lectures in topics allocated by the Department. The laboratory programme will involve experiments associated with two of these branches (e.g. physical and analytical chemistry).

Second Semester
As for first semester, except that the laboratory programme will be based on complementary areas (e.g. inorganic and organic chemistry).

Tests
To be advised consult Departmental listings.

732300 CHEMISTRY III B
Pre or Corequisite Chemistry III A.

Hours
The total subject involves about 50 hours of lectures per semester. Associated with the lectures are about 8 hours per week of laboratory/tutorial work.

Examination
About one hour per unit, generally organized as 2 hour papers in the examination period after each semester.

Content
Students enrolling in Chemistry III B must study ten topics from the list provided by the Department.

Typical topic listings are:
- Organic Synthesis
- Organic Reaction Mechanisms
- Electrochemical Solar Energy Conversion
- Radiochemistry
- Chromatography
- Trace Analysis
- Biologically Important Molecules
- Co-ordination and Bioinorganic Chemistry
- Electronic Spectroscopy
- Chemometrics
- Cluster Chemistry
- Physical Organic Bonding

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

First Semester
Five lecture units, each involving 10 hours of lectures and about 20 hours of laboratory work/tutorial reading programme. The topics made available will include at least one from each of the discipline branches (analytical, inorganic, organic and physical chemistry).

Second Semester
As per first semester.

Tests
To be advised: see Departmental topic summaries.

SECTION FOUR

GEOL OGY SUBJECT DESCRIPTIONS

Geology Subject Descriptions

731100 GEOLOGY I
Prerequisite Nil

Examination
One 3-hour paper in the examination period after each semester, class assignments and practical examinations.

Content
First Semester
The Science of the Environment
A course examining in the widest context the evolution of our planet and man's physical environment. Specific topics are the earth in space; evolution and dynamics of the planets Earth; evolution of the atmosphere, hydrosphere, biosphere and man; the impact of climatic change; mineral resources, and the interaction between geology and society.

Hours
Three lecture hours, 2 tutorial/laboratory hours per week and field practicals in the natural environment.

Second Semester
The Crust of the Earth
A course integrating geological materials and processes within a plate tectonic framework. Magnatism, minerals, weathering, erosion, the formation of sediments, depositional environments and surficial processes are discussed in terms of modern and ancient environments. Modification by burial, metamorphism and uplift, patterns of life in the past and mineral and energy resources are presented.

Hours
Three lecture hours, 3 laboratory hours per week and field excursions.

Text
Clark, I.F. & Cook, B.J.(eds)
Perspectives of the Earth (Australian Academy of Science, 1983; Tien Wah Press)

732200 GEOLOGY II
Prerequisite Geology I.

Hours
Total of 9 hours per week of lectures and laboratory work plus field excursions.

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

Content
First Semester
A basic course in crystallography, optical mineralogy, rock forming minerals, petrology of igneous, metamorphic and sedimentary rocks.

Second Semester
Stratigraphy, stratigraphic relationships and mapping, structural geology, palaeontology, resource geology and data management.

732300 GEOLOGY III
Prerequisite Geology I.

Hours
An average of 9 hours per week on field work and associated lecture over the two semesters.

Examination
Assignments and practical examinations.

GEOLOGY SUBJECT DESCRIPTIONS

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

733100 GEOLOGY III A
Prerequisites Geology II A

Recommended Prerequisite
Geology I B

Preparatory Subjects
Chemistry I & either Physics I A or Physics I B.

Hours
A total of 12 hours per week, comprising 6 lecture hours and 6 laboratory hours per week and 8 days field work. (Includes Geophysics given by visiting lecturers during term and vacation times and practical Geophysics during vacation.)

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

Content

Petroleum
Petroleum of igneous rocks in relation to the tectonic environment; petrologists of metamorphic rocks.

Sedimentology
Petrography of sediments and processes.

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

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

Weathering
The mechanisms and geochemistry of weathering with relation to palaeoclimates and their products, laterites, gibberite, ferricrete, ironstone and gossans, together with application of mineralogical techniques to their composition e.g. XRD, XRF, AAS, IR, DTA, TG, TEM, EMPA and SEM.

Micropaleontology and Evolutionary Paleontology
Micropaleontology, 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 (undertaken at GEOS48 at Macquarie University).
SECTION FOUR

GEOL OGY SUBJEC T DESCRIPTIONS

Metamorphic Petrology
Examination of the textures of rocks formed during prograde metamorphism and ductile shearing; determination of processes involved in the production of grain shapes and deformation features within grains. 
Tests Consult lecturers concerned.
733308 GEOL OGY IIIA
Prerequisites Physics I A & Geology III A & Mathematics III A.
Students are advised to consult with the Head of the Department of Geology.

Mathematics Subject Descriptions
The Department of Mathematics offers and examines subjects, most being composed of topics, each single-unit topic consisting of about 27 lectures and 13 tutorials. Each of the Part I, Part II and Part III subjects consists of the equivalent of four single-unit topics. For Mathematics I, Mathematics IS, Mathematics I02 and Mathematics ICS there is no choice of topics; for Mathematics IIA, IIB and IIC there is some choice available to students; for Mathematics I IIA and IIB there is a wider choice. No topic may be counted twice in making up distinct subjects.

Progressive Assessment with respect to Mathematical Subjects
From time to time during the year students will be given assignments, tests, etc. Where a student's performance in the year has been better than that student's performance in the final examination, then the year's work will be taken into account in determining the final result. On the other hand, when a student's performance during the year has been worse than that student's performance in the final examination, then the year's work will be ignored in determining the final result. However, performance during the early part of the year is taken into account when considering a student's programme for "unsatisfactory progress". Course Coordinators are appointed each year. The Mathematics Departmental Office can direct students to the appropriate person.

PART I MATH EMATICS SUBJECTS
661100 MATH EMATICS I
Advisory Prerequisite Students intending to study Mathematics I are advised that since the minimum assumed knowledge for Mathematics I is 3-units of Mathematics at the Higher School Certificate, students who have less than 3-units of preparation will usually find themselves seriously disadvantaged.
It is recommended that students who have only 2-Unit Mathematics or 3-unit with a mark of less than 110 (out of 150) at the HSC should enrol in Mathematics IS, and not in Mathematics I.

Hours 4 lecture hours and 2 tutorial hours per week for both semesters.
Examination One 3-hour paper in the examination period after first semester. One 3-hour paper in the examination period after second semester.

Content
The following four topics:
Algebra
Real Analysis
Calculus
Statistics and Computing

Texts
University of Newcastle
Mathematics I Tutorial Notes (1989)
Anlin, H.
Elementary Linear Algebra 5th edn (Wiley, 1987)
Farrand, S. & Poxon, N.J.
Calculus (Harcourt Brace Jovanovich, 1984)

Students will be advised on any further texts.

References
See individual topics

MATH EMATICS I TOPIC DESCRIPTIONS

Algebra

References
Brisley, W.
A Basis for Linear Algebra (Wiley, 1973)
Johnson, R.S. & Vinoy, T.O.
Elementary Linear Algebra (Harcourt Brace Jovanovich, 1987)
Kolman, B.
Elementary Linear Algebra (Macmillan, 1977)
Lieberk, H.
Algebra for Scientists and Engineers (Wiley, 1971)
Lipuszcz, S.
Linear Algebra (Schaum, 1974)

Real Analysis

References
Apostol, T.
Calculus Vol. 1 2nd edn (Blaisdell, 1967)
Clark, C.W.
Elementary Mathematical Analysis (Wadsworth-Brooks, 1982)
Giles, J.R.
Real Analysis: An Introductory Course (Wiley, 1972)
Spivak, M.
Calculus (Benjamin, 1967)

Calculus

References
Ayers, F.
Calculus (Schaum, 1974)
Calculus and Analytical Geometry (Prentice-Hall, 1982)
Students wishing to proceed to a second year mathematics subject are required to compose and use effective programs and carry out laboratory work. An introduction to statistics is exploratory data analysis, uncertainty and random variation, probability, use of MINITAB.

### References


### List of Topics for Part II Mathematics subjects

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<thead>
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<td>CO Vector Calculus &amp; Differential Equations (Double Topic)</td>
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<tr>
<td>D Linear Algebra</td>
<td>Q, Q5, U, W, Z</td>
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<tr>
<td>E** Topic in Applied Mathematics e.g. Mechanics and Potential Theory</td>
<td>P, T, W, X, Z</td>
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<td>F* Numerical Analysis &amp; Computing</td>
<td></td>
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<tr>
<td>G* Discrete Mathematics</td>
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<tr>
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<td>W, X</td>
</tr>
<tr>
<td>L Analysis of Metric Spaces</td>
<td>V, W</td>
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</tbody>
</table>

*Offered in first semester in 1989

**Offered in second semester in 1989

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

### Notes

1. Students in the BMath degree whose course includes a Schedule B subject will have their choice of topics specified further than is set out in the rules below.
2. Students whose course includes Physics IIIA are advised to include topics CO, B and at least one of D, F in their Mathematics Part II subjects.
3. Students who wish to take all three subjects Mathematics IIA, IIB, IIC will be required to take the nine topics above together with either Probability and Statistics or some suitable third year topics. Such students should consult the Head of the Department concerning the appropriate choice.
4. Students who take Mathematics IICS together with Mathematics IIA will substitute a suitable topic for D in Mathematics IIA.

### 662100 MATHEMATICS IIA

**Prerequisite Mathematics I**

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

### 662200 MATHEMATICS IIB

**Prerequisite Mathematics I**

- **Hours 4 lecture hours and 2 tutorial hours per week for both semesters.**
- **Examination Each topic is examined separately.**
- **Content**
  - Four topics chosen from A to G, where CO counts as two topics, and approved by the Head of the Department. In exceptional circumstances and with the consent of the Head of the Department one of the topics from Statistics II (offered by the Department of Statistics), K or L may be included. Students undertaking the Bachelor of Mathematics degree may, with the consent of the Dean, take Mathematics IIB in two parts, each consisting of two topics.

### 662300 MATHEMATICS IIC

**Prerequisite Mathematics IIA**

- **Hours 4 lecture hours and 2 tutorial hours per week for both semesters.**
- **Examination Each topic is examined separately.**
- **Content**
  - Topics K, L plus either two topics chosen from A to G, or Probability and Statistics (the double topic offered by the Department of Statistics), or one topic chosen from A to G together with Random Processes and Simulation (offered by the Department of Statistics). Under exceptional circumstances, and with the consent of the Head of the Department, some substitution may be allowed.

### 662410 MATHEMATICS IICS

**Prerequisite Mathematics IIB**

- **Hours 4 lecture hours and 2 tutorial hours per week for both semesters.**
- **Examination Each topic is examined separately.**
### MATHEMATICS SUBJECT DESCRIPTIONS

#### 662101 Topic A - Mathematical Models

**Corequisite Topic CO**

**Hours** 3 hours per week for first semester.

**Examination** One 2-hour paper.

**Content**

Most of these topics each run through the full year.

**References**

- Noble, B. *Examination Hours*

#### 662202 Topic E - In applied Mathematics

**Corequisite Topic CO**

**Hours** 3 hours per week for second semester.

**Examination** One 2-hour paper.

**Content**


**References**

- Faires, J.D. *Numerical Analysis* (Wiley, 1984)
SECTION FOUR

MATHEMATICS SUBJECT DESCRIPTIONS

Cooper, D. & Clancy, M.  
Old Pascal (Wiley, 1985)

Crawley, J.W. & Miller, C.E.  
A Structured Approach to Fortran (Prentice-Hall, 1983)

Elter, D.M.  
Problem Solving with Structured Fortran 77 (Benjamin, 1984)

Elter, D.M.  
Structured Fortran 77 for Engineers and Scientists (Benjamin, 1983)

Gerald, C.F. & Wheatley, P.O.  
Applied Numerical Analysis (Addison-Wesley, 1984)

Maratos, S.  
Fortran 77 (Academic, 1983)

McCracken, D.D.  
Computing for Engineers and Scientists with Fortran 77 (Wiley, 1984)

McKeown, P.G.  
Structured Programming Using Fortran 77 (Harcourt, 1985)

Handbook for VAX/VMS (University of Newcastle Computing Centre, 1983)

VAX-11 Fortran (University of Newcastle Computing Centre, 1983)

662203  Topic G - Discrete Mathematics  
Prerequisite Nil  
Hours 3 hours per week for second semester.  
Examination One 2-hour paper.

Content  

Text  
Ross, K.A. & Wright, C.R.B.  
Discrete Mathematics 2nd edn (Prentice Hall, 1988)

References  
Grimaldi, R.P.  
Discrete and Combinatorial Mathematics (Addison-Wesley, 1985)

Kalman, K.  
An Introduction to Discrete Mathematics and its Applications (Addison-Wesley, 1986)

Dieker, P.F. & Vosman, W.L.  
Discrete Mathematics (Harcourt Brace Jovanovich, 1986)

662203  Topic K - Topic in Pure Mathematics  
Prerequisite Nil  
Hours 1 lecture hour per week and 1 tutorial hour per fortnight.  
Examination One 2-hour paper.

Content  

Text  
Ledermann, W.  
Introduction to Group Theory (Longman, 1976)

References  
Baumslag, B. & Chandlcr, B.  
Group Theory (Schaum, 1968)

Budden, F.J.  
The Fascination of Groups (CUP, 1972)

Gardiner, C.F.  
A First Course in Group Theory (Springer, 1980)

Herstein, I.N.  
Topics in Algebra 2nd edn (Wiley, 1975)

Weyl, H.  
Symmetry (Princeton, 1952)

662204  Topic L - Analysis of Metric Spaces  
Corequisite CO  
Hours 1 lecture hour per week and 1 tutorial hour per fortnight.  
Examination One 2-hour paper.

Content  

Text  
Giles, J.R.  
Introduction to the Analysis of Metric Spaces (CUP, 1987)

References  
Bartle, R.G.  
The Elements of Real Analysis (Wiley, 1976)

Giles, J.R.  
Real Analysis: An Introductory Course (Wiley, 1972)

Goldberg, R.R.  
Methods of Real Analysis (Ginn Blaisdell, 1964)

Simmons, G.F.  
Introduction to Topology and Modern Analysis (McGraw-Hill, 1963)

White, A.J.  
Real Analysis (Addison-Wesley, 1968)

GENERAL INFORMATION

Principal Dates 1989  
(See separate entry for Faculty of Medicine)

January  
2 Monday  Public Holiday — New Year's Day
6 Friday  Last day for return of Application for Re-Enrollment Forms — Continuing Students
9 Monday  Deferred Examinations begin
20 Friday  Deferred Examinations end
26 Thursday  Public Holiday — Australia Day
31 Tuesday  Applications for residence in Edwards Hall close after this date

February  
1 Wednesday  10 New students attend in person to enrol and pay charges
3 Friday  14 Tuesday  Re-enrollment Approval Sessions for re-enrolling students
17 Friday  21 Tuesday  Late enrolment session for new students
24 Friday  27 Monday  First Semester begins

March  
24 Friday  Good Friday — Easter Recess commence

April  
3 Monday  Lectures resume
24 Friday  Good Friday — Easter Recess commences

May  
2 Monday  Second Semester begins

June  
2 Friday  First Semester ends
6 Monday  Examinations begin
12 Monday  Public Holiday — Queen's Birthday
23 Friday  Examinations end
30 Friday  Closing date for applications for re-enrollment to the Bachelor of Medicine and the Diploma in Aviation Science courses in 1990

July  
10 Monday  Second Semester begins
24 Monday  Last day for withdrawal without academic penalty from full year subjects (See page (iii) for Dean's discretion)

TERM DATES FOR THE BACHELOR OF MEDICINE PROGRAMME 1989

Year 1  
Term 1  
Feb 20 — May 5  
11 weeks: 10 week term  
1 week AVCC vacation 22-3/10

Vacation  
May 8 — May 19  
2 weeks

Term 2  
May 22 — Aug 4  
11 weeks: 9 week term  
1 week AVCC vacation 3-5/7  
1 week formative assessment 31/7-4/8

Vacation  
Aug 7 — Aug 11  
1 week

Term 3  
Aug 14 — Oct 27  
11 weeks: 9 week term  
1 week AVCC vacation 23-2/9  
1 week consolidation 23-2/10

Vacation  
Oct 30 — Nov 3  
2 weeks

Assessment  
Nov 6 — Nov 17  
2 weeks

Mini-Exams  
Nov 20 — Dec 1  
2 weeks

Note: Date not finalised.
Advice and Information

Advice and Information on matters concerning the Faculties of the University can be obtained from the number of people.

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

- Faculty Secretary
- Phone
- Office

Assessment
- Term 1
- Sept 4
- Sept 15
- 2 weeks
- Term 2
- Oct 26
- Dec 1
- 2 weeks

Mini Essay
- Term 1
- Oct 30
- Nov 3
- 1 week
- Term 2
- Nov 17
- Dec 22
- 1 week

Stevac
- Term 1
- Oct 30
- Nov 12
- 2 weeks
- Term 2
- Nov 17
- Dec 22
- 1 week

Vacation
- Term 1
- Oct 30
- Nov 12
- 2 weeks
- Term 2
- Nov 17
- Dec 22
- 1 week

Year II

Term 1
- Feb 20
- May 5
- 11 weeks: 10 work weeks
- 1 week AVCC vacation

Term 2
- May 8
- Aug 4
- 11 weeks: 9 work terms
- 1 week AVCC vacation 3-47
- 1 week work consolidation

Vacation
- Aug 7
- Aug 11
- 1 week

Term 3
- Aug 14
- Oct 27
- 11 weeks: 9 work terms
- 1 week AVCC vacation 25-29
- 1 week work consolidation 23-27

STEVAC
- Term 1
- Oct 30
- Nov 3
- 1 week
- Term 2
- Nov 17
- Dec 22
- 1 week

Assessment
- Term 1
- Oct 30
- Nov 3
- 1 week
- Term 2
- Nov 17
- Dec 22
- 1 week

Stevac
- Term 1
- Oct 30
- Nov 3
- 1 week
- Term 2
- Nov 17
- Dec 22
- 1 week

Vacation
- Term 1
- Oct 30
- Nov 3
- 1 week
- Term 2
- Nov 17
- Dec 22
- 1 week

Year III

Term 1
- Feb 6
- Apr 28
- 12 weeks: 11 work weeks
- 1 week AVCC vacation 27-31

Term 2
- May 1
- Aug 21
- 11 weeks: 9 week term
- 1 week vacation

Vacation
- Aug 7
- Aug 11
- 1 week

Term 3
- Aug 7
- Aug 11
- 1 week

STEVAC
- Term 1
- Oct 30
- Nov 3
- 1 week
- Term 2
- Nov 17
- Dec 22
- 1 week

Assessment
- Term 1
- Oct 30
- Nov 3
- 1 week
- Term 2
- Nov 17
- Dec 22
- 1 week

Stevac
- Term 1
- Oct 30
- Nov 3
- 1 week
- Term 2
- Nov 17
- Dec 22
- 1 week

Vacation
- Term 1
- Oct 30
- Nov 3
- 1 week
- Term 2
- Nov 17
- Dec 22
- 1 week

Year IV

Term 1
- Feb 6
- Mar 17
- 6 weeks
- Term 2
- Mar 20
- May 5
- 6 weeks

Term 3
- May 9
- Aug 21
- 6 weeks

Term 4
- Aug 7
- Nov 10
- 6 weeks

G.P. Period
- Nov 17
- Jan 21
- 10 weeks (inclusive)

Assessment
- Nov 17
- Dec 4
- 1 week

Year V

GP Term
- Feb 6
- Feb 17
- 2 weeks

Term 1
- Mar 24
- May 12
- 6 weeks

Term 2
- Apr 28
- June 16
- 6 weeks

Term 3
- May 22
- Aug 4
- 6 weeks

Term 4
- June 25
- Sept 4
- 6 weeks

Term 5
- Aug 29
- Nov 10
- 6 weeks

Assessment
- Sept 4
- Sept 24
- 1 week

2nd Assesement
- Sept 24
- Nov 17
- 6 weeks

3rd Assessment
- Nov 20
- Nov 24
- 1 week

RE-ENROLLMENT KITS

Students who wish to re-enroll for 1989 will be sent out at the beginning of December. The re-enrolment kit contains the student's Application for Re-enrolment form, the 1989 Class Timetable, the Statement of Charges Payable for 1989 and re-enrolment instructions.

 Lodging Application for Re-Enrolment Forms

The Application for Re-enrolment form must be completed carefully and lodged at the Student Administration Office by 6 January 1989. Students should note that they must ensure their examination results before completing the re-enrolment form. There is no late charge payable if the form is late, but it is very important that the Application for Re-enrolment form is lodged by 6 January 1989 as late lodgement will mean that enrolment approval will not be possible before the late re-enrolment session.

Enrolment Approval

All re-enrolling students (except those essential in the BModer) are required to attend at the Great Hall on a specified date and time during the period 14-17 February 1989. Enrolment Approval dates are posted on University Noticeboards and are included in the enrolment kits issued to students in December. When attending for Enrolment Approval students will collect their approved 1989 programme and student card. Any variations to the proposed programme require approval. Enrolments in tutorial or laboratory sessions will be arranged. Staff from academic Departments will be available to answer any queries.

A service charge of $85.25 will be imposed on students who re-enrol after the specified date.

Payment of Charges

The re-enrolment kit issued to re-enrolling students includes a Statement of Charges Payable form which must accompany the payment of charges for 1989. These charges may be paid at any time after receiving the re-enrolment kit.

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

Payment by mail is encouraged; alternatively by cheque or money order lodged in the internal mail deposit box outside the Cashier's Office in the McMullin Building. The receipt will be mailed to the student.

The Cashier's Office will be open for extended hours during the enrolment approval sessions in the period 14-17 February 1989. Afterwards any further payment should be by mail only.

LATE PAYMENT

The General Services Charge is due before or upon re-enrolment. The final date for payment is the date of the Re-enrolment Approval session for the course concerned in the period 14-17 February 1989, after which a late charge applies at the rate of $10.00 if payment is received up to and including 7 days after the due date; or $20.00 if payment is received between 8 and 14 days after the due date; or $50.00 if payment is received 15 or more days after the due date.

Furthermore enrolment will be cancelled if charges remain unpaid by 31 March.

STUDENT CARDS

When attending for Enrolment Approval, students will be given their Approved Programme form which incorporates the Student Card. The Student Card should be carried by students when at the University in evidence of enrolment. The Student Card has machine readable lettering for use when borrowing books from the University Library, and contains the student's interim password for access to facilities of the Computing Centre.

Students are urged to take good care of their Student Card. If the card is lost or damaged, there is a service charge of $5 payable before the card will be replaced.

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

ADMISSION AFTER ABSENCE

A person wishing to resume an undergraduate degree course who has been enrolled previously at the University of Newcastle, but not re-enrolled in 1988, is required to apply for admission again through the Universities and Colleges Admissions Centre, Locked Bag 500 Lithgow 2441. Application forms can be obtained from the UCAC or from the Student Administration Office and closed with the UCAC on 30 September each year. There is a $50 fee for late applications.

ATTENDANCE STATUS

A candidate for any qualification other than a postgraduate qualification who has been enrolled previously in three quarters or more of an annual 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 in 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 teaching or course information not reaching the student. The University cannot accept responsibility if out of date communications fail to reach a student who has not notified the Student Administration Office of a change of address.

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

CHANGE OF NAME

Students who change their names should advise the Student Administration Office.

Marriage or death certificates should be presented for sighting in order that the change can be noted on University records.

PROGRAMME OF CHANGE

Approval must be sought for any changes to the programme for which a student has enrolled. This includes adding or withdrawing subjects, or changing attendance status (for example from full-time to part-time). All proposed changes should be documented on the Variation of Programme section of your Approved Programme form. Reasons for changes and where appropriate documentary evidence in the form of medical or other appropriate corroboration must be submitted.

WITHDRAWAL

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

Withdrawal Dates

<table>
<thead>
<tr>
<th>Full Year</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
</table>

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

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

CONFIRMATION OF ENROLMENT

Students should ensure that all details on their Approved Programme forms are correct. Failure to check this information could create problems at examination time.

FAILURE TO PAY OVERDUE DEBTS

Any student who is indebted to the University by reason of non-payment of any fee or charge, non-payment of any fine imposed, or who has failed to pay any overdue debts, must be permitted to:

- complete enrolment in a following year
- receive a transcript of academic record
- graduate or be awarded a Diploma, until such debts are paid.

Students are requested to pay any debts incurred without delay.

LEAVE OF ABSENCE

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

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

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

Applications for re-admission to undergraduate degree courses must be submitted by reason of non-payment of any fee or charge, non-payment of any fine imposed, or who has failed to pay any overdue debts, must be permitted to:

- complete enrolment in a following year
- receive a transcript of academic record
- graduate or be awarded a Diploma, until such debts are paid.

Students are requested to pay any debts incurred without delay.

SITTING FOR EXAMINATIONS

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 manner calculated to enhance the reputation of the University.

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

NOTICES

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

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

STUDENT MATTERS GENERALLY

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

Examinations

Tests and assessments may be held in any subject from time to time. In the case 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:

<table>
<thead>
<tr>
<th>Mid Year</th>
<th>End of Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 23 June, 1989</td>
<td>6 to 24 November, 1989</td>
</tr>
</tbody>
</table>

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

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

SITTING FOR EXAMINATIONS

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 rooms 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 the Anthropology Study Centre. The test allocation list for examinations will be placed on the Noticeboard of the Department running the subject, and on a noticeboard outside the examination room.

Students cannot take any examination without the knowledge of their examiner, who will be in attendance at all examinations.

Any infringement of these rules constitutes an offence against discipline.

EXAMINATION RESULTS

Examination results and re-enrolment papers will be available for collection during the December holidays. The dates for collection will be put on noticeboards outside the main examination rooms in November.

Results not collected will be mailed.

No results will be given by telephone.

After the release of the annual examination results a student may apply to have a result reviewed. There is a charge of $8.00 per subject, which is refundable in the event of an error being discovered. Applications for review must be submitted on the appropriate form together with the prescribed review charge by 15 January 1989. However, it should be noted that examination results are released only after careful assessment of students' performances and that, amongst other things, marginal failures are reviewed before results are released.

SPECIAL CONSIDERATION

All applications for special consideration should be made on the Application for Special Consideration form. Relevant evidence should be attached to the application (see Regulation 12(2) of the Examination Regulations, Calendar Volume 1). Also refer to Faculty Policy.

A professor's or examiner's calculator will be permitted provided personal cards and devices are not taken into the examination room.

APPLICATION FORMS

Application forms for Special Consideration are available from the Student Administration Office and the University Health Services. Before a student's application for special consideration will be considered on the ground of personal illness it will be necessary for a medical certificate to be furnished in the form set out on the Application.

If a student is affected by illness during an examination and wishes to apply for special consideration, he or she must report to the supervisor in charge of the examination and then make written application to the Secretary within three days of the examination (see Regulation 12(2) of the Examination Regulations, Calendar Volume 1). Also refer to Faculty Policy.

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

DEFERRED EXAMINATIONS

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

Unsatisfactory Progress

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

Students who become liable for action under the Regulations will be informed accordingly by mail after the release of the End of Year examination results and will be informed of the procedure to be followed if they wish to 'show cause'.

Appeals against exclusion must be lodged together with Application for Re-enrolment forms by Friday 6 January 1989.

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. (1) All students are subject to the regulations of the University except those who are candidates for a degree of Master or Doctor.

3. (1) 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 Department. In determining whether a student is failing to maintain satisfactory progress the Head of Department may take into consideration such factors as:...
4. Where the progress of a student who is enrolled in a combined course (1)

(4) A student whose enrolment in a subject

Before a decision is made under regulation 3 together with a recommendation for such action as the Faculty Board is empowered to make pursuant to these Regulations: UNSATISFACTORY PROGRESS

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

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

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

c) exclude the student from the University.

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

A student may appeal to the Vice-Chancellor against any decision made by the Admissions Committee under this Regulation. 7. Where there is an appeal against any decision of the Admissions Committee made under Regulation 6 of these Regulations, the Vice-Chancellor may refer the matter back to the Admissions Committee with a recommendation or shall arrange for the appeal to be heard by the Council. The Council may confirm the decision of the Admissions Committee or may substitute for it any other decision which the Admissions Committee is empowered to make pursuant to these Regulations.

A student who has been excluded from further enrolment in a Faculty may enrol in a course in another Faculty only with the permission of the Faculty Board of that Faculty and on such conditions as the Faculty Board may determine.

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 three academic years from the date of the decision. A decision on such application shall be made by:

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

(b) 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.

The-door fee of $35 is required for the first time.

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

2. Late Charges Where the Statement of Charges payable form is lodged with all charges payable after the due date

• received up to and including 7 days after the due date; or

• received between 8 and 14 days after the due date; or

• received 15 or more days after the due date.

3. Other Charges

(a) Examination under special supervision

$15 per paper

(b) Review of examination results

$8 per subject

(c) Statement of matriculation status for non-members of the University

$8

(d) Replacement of Re-enrolment kit

$10

(e) Re-enrolment after the prescribed re-enrolment period

$10

(f) Replacement of Student Card

$5

4. Indebted Students

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

METHOD OF PAYMENT Students are requested to paycharge by mailing their cheques and the Statement of Charges Payable from the University Cashier. The Cashier’s internal mail deposit box outside of the Cashier’s Office at the McMillan Building may also be used. Payment should be addressed to the Cashier, University of Newcastle, NSW 2308. Cheques and money orders should be payable to the University of Newcastle. Cash payment must be made at the Cashier’s Office, 1st Floor McMillan Building between the hours of 8.30am to 12noon or 2pm to 4pm. These hours will be extended in February.

HIGHER EDUCATION CONTRIBUTION SCHEME (HECS)

Legislation for the Higher Education Contribution Scheme (HECS) is still to be decided by Parliament and it is therefore possible that charges will be made to the proposed scheme before it is introduced. The information here is based on proposals intended to assist students who will be enrolling at the University in 1989.

Remember charges may occur before you enrol.

The Scheme will replace the Higher Education Administration Charge, which has applied since 1987. The intention of the proposed HECS is to make higher education students contribute towards the cost of their education. This will provide funds for additional students and possible increases in Austudy payments.

All students, apart from some exemptions, enrolled in institutions of higher education in 1989 will be liable under HECS. Exemption from payment of the HECS applies as follows:

- a fee-paying student in a "focuss-approved postgraduate award course";
- a student in a "basic nurse education course";
- a "full-time paying overseas student";
- a "student who has paid the Overseas Student Charge";
- a "focuss-sponsored overseas student";
- a student in an "enabling course";
- a student in a "non-award course".

Your liability will depend on the equivalent full-time student unit value you generate in a semester taken at 31 March and 31 August.

It should be noted that if you withdraw after one of the above dates your liability will stand for the respective semester.

In 1989 the charge for a normal full-time programme will be $1,600 for the year and $600 for the semester. This amount will be increased each year in accordance with the consumer price index.

Students will have a choice of payment options at the time of enrolment and the Scheme will be administered as part of the normal enrolment process of institutions.

On enrolment students:

(a) will provide evidence of exemption from the Scheme and be enrolled, with details of their exempt status being recorded by the institution for submission to the Department of Employment, Education and Training;

(b) or (c) will elect to pay up-front (gaining a discount of 15%), in which case they would do so as part of their enrolment; students deciding to pay up-front for the second semester would be asked to do so at the commencement of the second semester;

(c) or (d) can elect to pay through the tax system, in which case they would either provide a tax file number or apply for a tax file number and either enrolment; institutions would be required to ensure that the information given by students on their tax file number application is the same as that on their enrolment form and this would be taken by the Australian Taxation Office.

Students opting for (b) or (c) will be able in each semester to choose between paying up-front for that semester or having their liability reduced from their tax file.

If you elect to pay through the tax system you will not be required to make a payment towards your contribution until your taxable income reaches a minimum of $25,000. This minimum level will be increased in line with the consumer price index each year.

At enrolment time each student will be required to complete a form which will indicate if the student is claiming exemption or the preferred method of payment.

SCHOLARSHIP HOLDERS AND SPONSORED STUDENTS

Students holding scholarships or receiving other forms of financial assistance must lodge with the Cashier their Statement of Charges Payable for each semester. A sponsor’s name or other written evidence that charges will be paid by the sponsor. Sponsors must provide a separate voucher warrant or letter for each student sponsored.
SECTION FOUR

PART III MATHEMATICS SUBJECTS

The Department offers Mathematics IIA and Mathematics IIB, each comprising four topics chosen from the list below. Both Mathematics IIA and Mathematics IIC are prerequisites for entry to Mathematics IIIA. Mathematics IIA is the prerequisite for Mathematics IIIB.

Students from other Faculties who wish to enrol in particular Part III topics, according to the course schedules of those Faculties, should consult the particulars of the list below, and should consult the lecturer concerned. In particular, the prerequisites may not all apply to specified topics.

Students wishing to proceed to Mathematics IV are required to take Mathematics IIIA and at least one of Mathematics IIB, Statistics III or Computer Science III. Students who wish to proceed to Honours will normally be required to study additional topics as prescribed by the Heads of the Departments concerned.

Students proceeding to Honours are required to prepare a seminar paper under supervision, and deliver it in a half-hour session. They may submit this paper as their essay requirement. Students taking either Mathematics IIA or Mathematics IIIA complete an essay on a topic chosen from the history or philosophy of Mathematics.

List of Topics for Part III Mathematics Subjects

<table>
<thead>
<tr>
<th>Topic</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M* General Tensors and Relativity</td>
<td>CO</td>
</tr>
<tr>
<td>N* Variational Methods and Integral Equations</td>
<td>CO</td>
</tr>
<tr>
<td>O* Mathematical Logic and Set Theory</td>
<td>—</td>
</tr>
<tr>
<td>P** Ordinary Differential Equations</td>
<td>CO, D</td>
</tr>
<tr>
<td>PD* Partial Differential Equations</td>
<td>CO</td>
</tr>
<tr>
<td>Q* Fluid Mechanics</td>
<td>CO, B</td>
</tr>
<tr>
<td>QS*** Quantum and Statistical Mechanics</td>
<td>CO</td>
</tr>
<tr>
<td>S** Geometry</td>
<td>—</td>
</tr>
<tr>
<td>T Combiningics and Geometry</td>
<td>D</td>
</tr>
<tr>
<td>U*** Introduction to Optimisation</td>
<td>CO</td>
</tr>
<tr>
<td>V Measure Theory &amp; Integration</td>
<td>L</td>
</tr>
<tr>
<td>W Functional Analysis</td>
<td>B, CO, D, K, L</td>
</tr>
<tr>
<td>X*** Fields &amp; Equations</td>
<td>D, K</td>
</tr>
<tr>
<td>Z** Mathematical Principles of Numerical Analysis</td>
<td>CO, D</td>
</tr>
</tbody>
</table>

* Offered in first semester in 1989.
** Offered in second semester in 1989.
*** Not offered in 1989.

Notes:
1. In order to take both Mathematics IIA and Mathematics IIB, a student must study at least eight topics from the above with due regard to the composition of Mathematics IIA.
2. Students aiming to take Mathematics IV may be required to undertake study of extra topics. They should consult the Head of Department concerning the arrangements.
3. Each topic involves 3 hours per week (including lectures and tutorials) in the appropriate semester.

663100 MATHEMATICS IIA
Prerequisites: Mathematics IIA & IIC
Hours: As appropriate for four topics.
Examination: Each topic is examined separately.

663200 MATHEMATICS IIB
Prerequisite: Mathematics IIA
Hours: As appropriate for four topics.
Examination: Each topic is examined separately.

PART III MATHEMATICS TOPICS

663101 Topic N - General Tensors and Relativity
Prerequisite: Topic CO
Hours: Three hours per week in first semester.
Examination: One 2-hour paper.

Content: Covariant and contravariant vectors, general systems of coordinates. Covariant differentiation, differential operators in general coordinates. Riemannian geometry, metric, curvature, geodesics. Applications of the tensor calculus to the theory of elasticity, dynamics, electromagnetic field theory, and Einstein's theory of gravitation.

Text Nil

References:
Abram, J.
Tensor Calculus through Differential Geometry (Butterworths, 1965)
Landau, L.D. & Lifshitz, E.M.
The Classical Theory of Fields (Pergamon, 1962)
Lichnerowicz, A.
Elements of Tensor Calculus (McGraw, 1962)
Tyndale, J.R.
An Introduction to Tensor Analysis (Longman, 1975)
Willmore, T.J.
An Introduction to Differential Geometry (Oxford, 1972)
**SECTION FOUR**

**MATHEMATICS SUBJECT DESCRIPTIONS**

**663102 Topic N - Variational Methods and Integral Equations**

**Prerequisite** Topic CO

**Hours** Three hours per week in first semester.

**Examination** One 2-hour paper.

**Content**

Problems with fixed boundary: Euler's equation, other governing equations and their solutions; parametric representation; Problems with movable boundaries: transversality condition; natural boundary conditions; discontinuous solutions; corner conditions. Problems with constraints: Isoperimetric problems. Direct methods. Fredholm's equation; Volterra's equation; existence and uniqueness theorems; method of successive approximations; other methods of solving. Fredholm's equation with degenerate kernels and its solutions.

**Text Nil**

**References**

- Arthurs, A. Complementary Variational Principles (Pergamon, 1964)
- Elias, L. Calculus of Variations (Pergamon, 1963)
- Kanwal, R.P. Linear Integral Equations (Academic, 1971)
- Weinstock, R. Calculus of Variations (McGraw-Hill, 1952)

**663103 Topic O - Mathematical Logic and Set Theory**

**Prerequisite** Topics K & L are recommended but not essential, but some maturity in tackling axiomatic systems is required.

**Hours** Three hours per week in first semester.

**Examination** One 2-hour paper.

**Content**

- Basic concepts: continuum, pressure, viscosity. Derivation of the equations of motion for a real incompressible fluid; Poiseuille and Stokes' boundary layer flow. Dynamical similarity and the Reynolds number. Flow at high Reynolds number; ideal (non-Newtonian) fluid; simplification of the equations of motion; Bernoulli equations; the case of irrotational flow; Kelvin's circulation theorem. Investigation of simple irrotational inviscid flow; two-dimensional flows; circulation: axisymmetric flow around a sphere; virtual mass. Generation of vorticity at solid boundaries; boundary layers and their growth in flows which are initially irrotational.

**Text Nil**

**References**


**663104 Topic P - Ordinary Differential Equations**

**Prerequisites** Topics CO & D

**Hours** 2 lecture hours and 1 tutorial hour per week for second semester.

**Examination** One 2-hour paper.

**Content**

First order equations: linear equations, Cauchy problems; general solutions; non-linear equations; Cauchy's method characteristics; compatible systems of equations; complete integrals; the methods of Charpit and Jacobi. Higher order equations: linear equations with constant coefficients; reducible and irreducible equations; second order equations with variable coefficients; characteristics; hyperbolic, parabolic and elliptic equations. Special methods: separation of variables; integral transforms; Green's function; Applications in mathematical physics where appropriate.

**Text Nil**

**References**

- Batchelor, G.K. An Introduction to Fluid Dynamics (Cambridge, 1967)
- Curle, N. & Davies, H.J. Modern Fluid Dynamics Vols I & II (Van Nostrand 2968 & 1971)
- Goldstein, S. (ed) Modern Development in Fluid Dynamics Vols I & II (Dover, 1965)
- Milne-Thompson, L.M. Theoretical Hydrodynamics (Macmillan, 1958)
- Pantz, R. Incompressible Flow (Wiley, 1984)
- Paterson, A.R. A First Course in Fluid Dynamics (Cambridge, 1983)
- Robertson, J.H. Hydrodynamics in Theory and Application (Prentice-Hall, 1965)

**663105 Topic Q - Fluid Mechanics**

**Prerequisites** Topics B, CO

**Hours** 2 lecture hours and 1 tutorial hour per week for first semester.

**Examination** One 2-hour paper.

**Content**

- Basic concepts: continuum, pressure, viscosity. Derivation of the equations of motion for a real incompressible fluid; Poiseuille and Stokes' boundary layer flow. Dynamical similarity and the Reynolds number. Flow at high Reynolds number; ideal (non-Newtonian) fluid; simplification of the equations of motion; Bernoulli equations; the case of irrotational flow; Kelvin's circulation theorem. Investigation of simple irrotational inviscid flow; two-dimensional flows; circulation: axisymmetric flow around a sphere; virtual mass. Generation of vorticity at solid boundaries; boundary layers and their growth in flows which are initially irrotational.

**Text Nil**

**References**

- Arthurs, A. Complementary Variational Principles (Pergamon, 1964)
- Elias, L. Calculus of Variations (Pergamon, 1963)
- Kanwal, R.P. Linear Integral Equations (Academic, 1971)
- Weinstock, R. Calculus of Variations (McGraw-Hill, 1952)

**663112 Topic S - Geometry**

**Not offered in 1989.**

**Examination** One 2-hour paper.

**Content**

- Basic concepts: continuum, pressure, viscosity. Derivation of the equations of motion for a real incompressible fluid; Poiseuille and Stokes' boundary layer flow. Dynamical similarity and the Reynolds number. Flow at high Reynolds number; ideal (non-Newtonian) fluid; simplification of the equations of motion; Bernoulli equations; the case of irrotational flow; Kelvin's circulation theorem. Investigation of simple irrotational inviscid flow; two-dimensional flows; circulation: axisymmetric flow around a sphere; virtual mass. Generation of vorticity at solid boundaries; boundary layers and their growth in flows which are initially irrotational.

**Text Nil**

**References**

- Batchelor, G.K. An Introduction to Fluid Dynamics (Cambridge, 1967)
- Curle, N. & Davies, H.J. Modern Fluid Dynamics Vols I & II (Van Nostrand 2968 & 1971)
- Goldstein, S. (ed) Modern Development in Fluid Dynamics Vols I & II (Dover, 1965)
- Milne-Thompson, L.M. Theoretical Hydrodynamics (Macmillan, 1958)
- Pantz, R. Incompressible Flow (Wiley, 1984)
- Paterson, A.R. A First Course in Fluid Dynamics (Cambridge, 1983)
- Robertson, J.H. Hydrodynamics in Theory and Application (Prentice-Hall, 1965)
This topic will introduce basic concepts in optimization theory. Prerequisites: Topics A and II; Part II mathematics subjects (IIA or IIB or IIC or IICS).

Hours: Three hours per week in second semester.

Examination: One 2-hour paper.

Content: Basic counting ideas, Combinatorial identities, partitions, Recurrence relations, generating functions, Polya methods and extensions, Equivalence of some "classical numbers", Construction of some designs and codes. Projective and affine geometry; symmetry; cones and quadratics.

Text Nil

References
Liu, C.L.
Introduction to Combinatorial Mathematics (McGraw Hill, 1984)

Krishnamurthy, V.

Brualdi
Introductory Combinatorics (North Holland, 1977)

Bogart
Introductory Combinatorics (Pitman, 1983)

Coazer

Tuckes
Applied Combinatorics (Wiley, 1984)

Street, A.P. & Wallis, W.D.
Combinatorics: A First Course (Charles Babbage Research Centre, 1982)

663201 Topic T - Combinatorics and Geometry

Prerequisites
At least one part II mathematics subject (IIA or IIB or IIC or IICS)

Hours
Three hours per week in second semester.

Examination
One 2-hour paper.

Content
Basic counting ideas, Combinatorial identities, partitions, Recurrence relations, generating functions, Polya methods and extensions, Equivalence of some "classical numbers", Construction of some designs and codes. Projective and affine geometry; symmetry; cones and quadratics.

Text Nil

References
Liu, C.L.
Introduction to Combinatorial Mathematics (McGraw Hill, 1984)

Krishnamurthy, V.

Brualdi
Introductory Combinatorics (North Holland, 1977)

Bogart
Introductory Combinatorics (Pitman, 1983)

Coazer

Tuckes
Applied Combinatorics (Wiley, 1984)

Street, A.P. & Wallis, W.D.
Combinatorics: A First Course (Charles Babbage Research Centre, 1982)

663202 Topic U - Introduction to Optimization

Not offered in 1989.

Prerequisite
Topic CO

Hours
Three hours per week for one semester (when offered).

Examination
One 2-hour paper.

Content
This topic will introduce basic concepts in optimization theory. It will provide background for solving mathematical problems that may arise in economics, engineering, the social sciences and the mathematical sciences. The following topics will be covered: convex and quasi-convex functions, local and global minima, Farkas' lemma, alternative theorems, Lagrangean, saddle points, necessary and sufficient conditions of optimality, regularity conditions, subgradient, subdifferentiability, stable problems, duality for convex problems, differentiable problems, finitely many constraints, problems with arbitrary constraints, the Kuhn-Tucker necessary condition, regularity conditions for differentiable problems, necessary and sufficient conditions of optimality for differentiable problems, duality of differentiable problems converge duality.

Text Nil

References
Cameron, N.
Introduction to Linear and Convex Programming (Cambridge University Press, 1985)

Ponstein, J.

Holmes, R.B.
A Course on Optimization and Best Approximation (Springer-Verlag, 1972)

Rockafellar, R.T.

Martos, B.
Optimization Theory and Methods (North Holland, 1975)

Werner, J.
Optimization Theory and Applications (Friedr. Vieweg & Sohn, 1984)

Luenberger, D.G.
Optimization by Vector Space Methods (John Wiley & Sons, 1969)

Luenberger, D.G.
Introduction to Linear and Nonlinear Programming (Addison-Wesley, 1973)

Mangasarian, O.L.
Linear Programming (McGraw-Hill, 1969)

Hestenes, M.R.
Optimization Theory: The Finite Dimensional Case (Wiley, 1975)

663203 Topic V - Measure Theory & Integration

Prerequisite
Topic L

Hours
2 lecture hours and 1 tutorial hour per week for first semester.

Examination
One 2-hour paper.

Content

Text Nil

References
Bartle, R.G.
The Elements of Integration (Wiley, 1966)

de Baro, G.
Introduction to Measure: Theory (Van Nostrand, 1974)

Halmos, P.R.
Measure Theory (Van Nostrand, 1950)

References
Kolmogorov, A.N. & Fomin, S.V.
Introduction to Measure and Integration (Addison Wesley, 1957)

Maurer, M.E.
Introduction to Measure and Integration (Addison Wesley, 1953)

Hestenes, M.R.
Optimization Theory: The Finite Dimensional Case (Wiley, 1975)

663204 Topic W - Functional Analysis

Prerequisite
Topics B, C, D, K, L

Hours
2 lecture hours and 1 tutorial hour per week for first semester.

Examination
One 2-hour paper.

Content
Hilbert space, the geometry of the space and the representation of continuous linear functionals. Operators on Hilbert space, adjoint, self-adjoint and projection operators. Complete orthonormal sets and Fourier analysis on Hilbert space.

Banach spaces, topological and isometric isomorphisms, finite dimensional space and their properties. Dual spaces, the Hahn-Banach Theorem and reflexivity. Spaces of operators, conjugate operators.

Text
Bartle, R.G.
Elements of Integration (Wiley, 1976)

Rudin, W.O.
Real and Complex Analysis (McGraw-Hill, 1987)

Stewart, I.
Calculus (Wiley, 1987)

663207 Topic Z - Mathematical Principles of Numerical Analysis

Prerequisites
Topics CO and D; Programming ability (high-level language) is assumed.

Hours
Two lecture hours and one tutorial hour per week for second semester.

Examination
One 2-hour paper.

Content
Solution of linear systems of algebraic equations by direct and linear iterative methods; particular attention will be given to the influence of various types of errors on the numerical results, to the general theory of convergence of the latter class of methods and to the concept of "condition" of a system. Solution by both one step and multistep methods of initial value problems involving ordinary differential equations. Investigation of stability of linear marching schemes. Boundary value problems. Finite-difference and finite-element methods of solution of partial differential equations. If time permits, other numerical analysis problems such as integration, solution of non-linear equations etc. will be treated.
Physics Subject Descriptions

741200 PHYSICS I
Prerequisite: Nil, however refer to the Advisory Prerequisite for entry to the Faculty.
Hours: 3 lecture hours and an average of 3 hours of laboratory and tutorial work per week.

Examination: Each semester will be examined separately. One paper at the end of first semester, one paper at the end of second semester, together with laboratory and tutorial assessment.

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

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


741300 PHYSICS II
Prerequisite: Nil, however refer to the Advisory Prerequisite for entry to the Faculty.
Hours: Approximately 120 lecture hours and 240 laboratory and tutorial hours.

Examination Assessment equivalent of 12.5 hours of examination time.

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

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

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

Lectures
Parallel 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.

Text: Refer to the Physics Department notice board. Students should retain their Physics II texts.

References
Adkinson, K.E., An Introduction to Numerical Analysis (Wiley, 1978)
SECTION FOUR

Psychology Subject Descriptions

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

1. The Bachelor of Science degree with Honours in Psychology remains the preferred path for those who wish to complete a four-year Psychology course.

2. Students will not be permitted to transfer from Psychology IVA to Psychology IV, although the reverse may be permissible.

751100 PSYCHOLOGY I

Prerequisite: Nil

Hours: 3 lecture hours and one 2-hour practical/tutorial session for both semesters.

Examination: One two-hour examination to be held in the examination period after each semester. An assessment of practical work will count for 50%, and the two examination papers will count for 50%. Students must demonstrate competence in both practical work and examination components to pass the subject.

Content: First semester:

Introduction to Investigatory Methods, Perception and learning and Developmental Psychology.

Second semester:

Biological Foundations, Social Psychology and Personal Psychology.

Recommended Reading (Both Semesters)

A manual for the subject is published by the Department and should be purchased from the Cooperative Bookshop.

Myers, D.G.

Psychology (N.Y. Worth, 1986) or other recent introductory texts.

Test (for Investigatory Methods)

Howell, D.C.

Fundamental Statistics for Behavioural Sciences, (Duxbury, 1985)

Reference for Perception course

Goldstein, E.B.

Sensation and Perception, 2nd edn (Wadsworth, 1984)

752200 PSYCHOLOGY III

Prerequisite: Psychology I

Hours: 3 lecture hours, one 2-hour practical session & 1 tutorial hour per week.

Examination: Two 3-hour papers plus an assessment of practical work. A 2-hour experimental methodology examination will be held in July for this semester topic.

Content:

Topics such as animal behaviour, behavioural neurosciences, developmental psychology, experimental methodology, individual differences, information processing, learning and conditioning, social psychology will be examined.

Text: To be advised.

753100 PSYCHOLOGY IIIA

Prerequisite: Psychology IIA

Hours: 4 lecture hours and up to 5 hours practical work per week for both semesters.

Examination: Two 3-hour papers plus an assessment of practical work. A 2-hour experimental methodology examination will be held in July for this semester topic.

Content:

Topics such as animal behaviour, behavioural neurosciences, developmental psychology, experimental methodology, individual differences, information processing, learning and conditioning, social psychology will be examined.

Text: To be advised.

753200 PSYCHOLOGY IIIB

Prerequisite: Psychology IIIB

Co-requisite: Psychology IIIA

Hours: 4 lecture/seminar hours and approximately 5 hours practical work per week for both semesters. Some material may
Computer Science Subject Descriptions

Students enrolled in the Faculty of Science and Mathematics may apply for permission to enrol in Computer Science I. However, the number of such students permitted to enrol in Computer Science I is limited by quota. Application for permission to enrol in Computer Science I may be made at the annual Enrolment and Re-enrolment Approval Sessions. Following completion of Computer Science I, students may take a major sequence in computer science, consisting of the subjects: Computer Science II and Computer Science III. In the BMath degree students may also take the honours subject Computer Science IV.

Topics: Students of any of these degrees who have passed Computer Science IIIA at least credit level or higher, may apply for enrolment in the Bachelor of Computer Science (Honours) degree.

Examinations: One 2-hour paper after first semester and two 2-hour papers after second semester.

Computer Science Subject Descriptions

Comparative Programming Languages
Data Structures & Algorithms

Descriptions of these topics appear as the subject descriptions for the Diploma in Computer Science subjects of the same names in Section Six.

682900 COMPUTER SCIENCE II
This subject is available only to students who were enrolled prior to 1986 and require it for transition purposes.

Prerequisites: Mathematics I
Hours: 4 lecture hours and approx. 4 hours of tutorials and practical work per week

Examinations: By topic

Content:
This subject comprises the four topics:
- Introduction to Programming
- Assembly Language
- Comparative Programming Languages
- Data Structures & Algorithms

Descriptions of these topics appear as the subject descriptions for the Diploma in Computer Science subjects of the same names. Refer to the Engineering Faculty Handbook.

683200 COMPUTER SCIENCE IIIA
Prerequisites: Computer Science II passed in or since 1987
Hours: 4 lecture hours per week, with tutorials as required, plus a 100-hour project

Examinations: By topic, plus a report on the project undertaken

Content:
This subject comprises a project, and the four topics:
- Software Engineering Principles
- Compiler Design
- Operating Systems
- Database Design

Descriptions of these topics appear as the subject descriptions for the Diploma in Computer Science subjects of the same names. Refer to the Engineering Faculty Handbook.

683300 COMPUTER SCIENCE IIIB
Prerequisites: Computer Science II passed in or since 1987 and Mathematics II C3
Hours: 4 lecture hours per week, with tutorials as required, plus a 100-hour project

Examinations: By topic, plus a report on the project undertaken

Content:
This subject comprises a project, and the four topics:
- Artificial Intelligence Programming Techniques
- Computer Networks
- Computer Graphics
- Theory of Computation

Descriptions of these topics appear as the subject descriptions for the Diploma in Computer Science subjects of the same names. Refer to the Engineering Faculty Handbook.
Human Ecology
This course is an introduction to the study of human settlements through the theories and methods of human ecology. These approaches have been a part of the study of human ecology during the past 70 years. Human ecology studies the spatial and temporal interactions between people and their environment, typically the built environment. The course follows a synchronological approach, being concerned with the processes and patterns associated with rather large numbers of people and not with small groups or individuals. Topics covered include: systems, information and communication as basic structuring elements of settlement ecosystems, ekistics, classical human ecology, neo-classical ecology, the census as a data source for ecological analyses, social area analysis, factorial ecology and the human ecology of cities in Asia and South America.

Text
Johnston, R.J. (et al.) (eds.)

References
Boydton, S., Millar, K. (et al)
The Ecology of a City and its People. The Case of Hong Kong (ANU Press, Canberra 1981)

Hawley, A.H.

Rapport, A.

Walmsey, D.J. & Lewis, G.J.

Wicker, A.W.
An Introduction to Ecological Psychology (Wadsworth, Belmont, Calif 1979)

Human Ecosystems of Northern Australia and the Arid Lands
The Australian arid lands, including northern Australia as the area north of the 26th parallel, occupy over 75% of the mainland. The course introduces students to the selected human ecosystems in this vast region. Human ecosystems are those that are managed (or mismanaged) by human intervention. Particular emphasis is placed on the remote communities and the studies by CSIRO’s Remote Communities Unit. Other ecosystems given emphasis are the tourism and rangeland ecosystems of central and northern Australia. The perception of desertification, one of the world’s worst unreported but most aggressive environment pathologies will also be considered, as it applies to Australia. The course is weighted towards conceptual and theoretical considerations rather than to description of the region.

Text
Parkes, D.N. (ed.)

References
Cortesmay, P.
Northern Australia (Longman 1982)

Heathcote, R.L.
The Arid Lands: Their Use and Abuse (Longman 1983)
GEOPHYSICAL METHODS

This course introduces students to a range of computer-based methods for descriptive, simulation, and analysis of human geographic data. The course commences with the analysis of Australian Census data using a CSIRO program called LAMM, for local area mapping of census data. The course will then consider the following computer-based methods for analysis of urban and regional demographic and economic data: trend projection models, simple population cohort-survival method, economic base model, shift and share, and mobility regional models. An analysis will be undertaken using the micro-computer in the Department of Geography.

Text: No text set

References:
Ouzennmann, J.R. Basic Microcomputer Programs for Urban Analysis and Planning (Melbourne, London 1985)
Smith, D.M. Patterns in Human Geography (1985)

Geography of Australia: an Historical Perspective
Selected aspects of historical geography of Australia. Topics to be studied include: exploratory images, image-makers and vision of Australia; migration and the population geography of Australia before 1914; urbanization; and agricultural land use 1788 to 1914; the historical geography of the Great Depression.

Explanation in human geography

An analysis of what a sample of geographers have claimed to know about the world. The course emphasises the use of primary sources from the mid-nineteenth century and from current literature and identifies the parameters of professional literacy for the late 1980s and beyond.

Texts:
Statistics Subject Descriptions

Details of courses offered by the Department of Statistics can be obtained from the Departmental Secretary or from Professor Dobson. Further information about statistics courses also appears in the section Notes on Degrees and Diplomas.

PART I STATISTICS SUBJECT

692100 STATISTICS I

Prerequisite Mathematics I

Hours Two lecture hours per week and practical work for first semester only.

Examination Assignments, tests and one 2-hour examination.

Content

Topics covered include: exploratory data analysis, probability theory, sampling, quality control, error propagation, confidence intervals and hypothesis tests, eg for means and proportions, simple linear regression and contingency tables.

Emphasis is placed on data analysis using the statistical computer program MINITAB.

Text

Chatfield, C.


References

Ryan B.F., Joiner B.L. and Ryan T.A.


Freund J.E. and Walpole R.E.


PART II STATISTICS TOPICS

692102 PROBABILITY AND STATISTICS

Prerequisite Mathematics I

Hours Four lecture hours, one tutorial hour and one computing laboratory hour per week for first semester only.

Examination Assignments, tests and one 3-hour examination.

Content

This is a double topic. As the core Statistics topic, this course introduces the key concepts of probability theory, mathematical statistics and data analysis. The emphasis is on current statistical thinking, and the statistical computer program MINITAB is used extensively.

Topics covered include: descriptive statistics and exploratory data analysis, probability distributions, random variables, sampling distributions, parameter estimation and confidence intervals, hypothesis testing, goodness-of-fit tests, contingency tables, correlation and simple linear regression, an introduction to experimental design and analysis of variance, nonparametric statistics, and quality control.

Text

Larson, R.J. and Marx, M.L.


References

Morgan B.J.T.

Elements of Simulation (Chapman and Hall, 1984)

Ross, S.

Stochastic Processes (Wiley, 1983)

692104 DESIGN AND ANALYSIS OF EXPERIMENTS

Prerequisite Probability and Statistics

Hours Two lecture hours and one tutorial hour per week for second semester only.

Examination Assignments, tests and one 2-hour examination.
### PART III STATISTICS SUBJECT

<table>
<thead>
<tr>
<th>Subject No.</th>
<th>Subject Title</th>
<th>Credits</th>
<th>Hours</th>
<th>Exam Type</th>
<th>Prerequisite</th>
<th>Notes</th>
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<tbody>
<tr>
<td>693105</td>
<td>GENERALIZED LINEAR MODELS</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>Statistics II</td>
<td>None</td>
</tr>
<tr>
<td>693107</td>
<td>TIME SERIES ANALYSIS</td>
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<td>2</td>
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<tr>
<td>693108</td>
<td>SURVEY SAMPLING</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>Probability and Statistics</td>
<td>None</td>
</tr>
</tbody>
</table>

### STATISTICS SUBJECT DESCRIPTIONS

**693105 GENERALIZED LINEAR MODELS**

**Prerequisite:** Statistics II  
**Hours:** Two lecture hours and one tutorial hour per week for first semester only.  
**Examination:** Assignments, tests and one 2-hour examination  

**Content:**
This course covers the theory of generalized linear models and illustrates how many methods for analysing continuous, binary, and categorical data fit into this framework. Topics include the exponential family of distributions, maximum likelihood estimation, sampling distributions for goodness-of-fit statistics, linear models for continuous data (regression and analysis of variance), logistic regression, and log-linear models. Students will implement these methods using various computer packages, including GLIM.

**References:**
- Dobson, A.J. 
- An Introduction to Statistical Modelling (Chapman & Hall, 1983)

**693107 TIME SERIES ANALYSIS**

**Prerequisite:** Probability and Statistics  
**Hours:** Two lecture hours and one tutorial hour per week for second semester only.  
**Examination:** Assignments and one 2-hour examination  

**Content:**
This course is about the theory and practice of Time Series Analysis - the analysis of data collected at regular intervals in time (or space). Topics covered include: stationary processes, ARMA models, models for periodic phenomena, analysis using MINITAB and other Time Series packages.

**References:**
- Cryer, J.D. 
- Time Series Analysis (Duxbury Press, 1986)

**693108 SURVEY SAMPLING**

**Prerequisite:** Probability and Statistics  
**Hours:** Two lecture hours and one tutorial hour per week for first semester only.  
**Examination:** Assignments, tests and one 2-hour examination  

**Content:**
This course covers the statistical principles that are used to construct and assess methods for collecting and analyzing data from finite populations. Topics covered include: simple random sampling, ratio and regression estimators, stratified sampling and cluster sampling, and other relevant sections from the text. An introduction to the use of computer for processing and analyzing survey data will be given. Some consideration of the practical problems will be obtained through the class projects.

**References:**
- Barnard, V. 
- Elements of Sampling Theory (R.U.P., 1974)
423800 ECONOMICS IIC
Prerequisites: Mathematics IIA & IIC & Economics IIA
Hours: As determined by the components
Examination: As determined by the components.

423208 Econometrics I - 1.0 point
423204 Mathematical Economics - 1.0 point
423113 Development - 0.5 point
421002 International Economics - 0.5 point
423114 Growth and Fluctuations - 0.5 point
423115 Topics in International Economics - 0.5 point
423116 Economics III - Core - 1.0 point

For unit descriptions consult the Handbook of the Faculty of Economics and Commerce.

534500 INDUSTRIAL ENGINEERING I
Prerequisites: Mathematics IIA & IIC
Hours: Approximately 6 lecture hours per week
Examination: Progressive assessment & examination

Content: Four of the following:
(i) 543501 ME381 Methods Engineering
(ii) 543502 ME383 Quality Engineering
(iii) 543503 ME384 Design for Production
(iv) 544469 ME419 Bulk Materials Handling Systems I
(v) 544433 ME482 Engineering Economics I
(vi) 544470 ME483 Production Scheduling
(vii) 544464 ME484 Engineering Economics II

For unit descriptions consult the Faculty of Engineering Handbook.

533900 COMMUNICATIONS AND AUTOMATIC CONTROL
Prerequisites: Mathematics IIA & IIC (including Topics CO, D)
Hours: 6 lecture, tutorial & laboratory hours per week
Examination: Progressive assessment & final examination

Content:
(i) 530005 GE361 Automatic Control
(ii) 533113 EE334 Communications
(iii) 534134 EE447 Digital Communications

For unit descriptions consult the Faculty of Engineering Handbook.

533901 DIGITAL COMPUTERS AND AUTOMATIC CONTROL
Prerequisites: Mathematics IIA & IIC (including Topics CO, D)
Hours: 6 lecture, tutorial & practical hours per week
Examination: Progressive assessment & final examination

Content:
(i) 530006 GE361 Automatic Control
(ii) 532116 EE364 Assembly Language and Operating Systems - see CS II topic: Introduction to Assembly Language and Operating Systems
(iii) 533902 EE362 Switching Theory & Logical Design.

543500 MECHANICAL ENGINEERING IIC
Prerequisites: Mathematics IIA & IIC (including Topics F & H)
Hours: 6 hours per week
Examination: Progressive assessment

Content: Four units:
(i) GE361 Automatic Control
(ii) ME505 Advanced Numerical Programming
(iii) ME487 Operations Research - Fundamental Techniques
(iv) ME488 Operations Research - Planning, Inventory Control and Management

For unit descriptions consult the Faculty of Engineering Handbook.

SECTION FOUR
ADDITIONAL BACHELOR OF MATHEMATICS SUBJECT DESCRIPTIONS

Extraneous Subjects
160406 MATHEMATICS EDUCATION II
Prerequisite: Mathematics I
Corequisite: A Part II Mathematics subject or Statistics II
Hours: Two hours per week for both Semesters.
Examination: Progressive assessment.

Intention: To introduce students of Mathematics to the knowledge, skills and attitudes for teaching Mathematics in schools.

Content:
Two aspects of Mathematics as an Educational Task:

Procedure:
The course requires active participation by students in preparing and presenting material from both strands for group discussion and tutorials. In addition each student will prepare case studies on how people learn mathematics. The intention is for students to develop the techniques of:
- content analysis, planning teaching and learning activities, communicating mathematical ideas, negotiating mathematical meanings with people, reflecting on Mathematics as an Educational Task.

Each student will be expected to prepare and maintain a casebook listing:
- activities undertaken,
- teaching situations experienced,
- ideas communicated,
- meanings negotiated,
- ideas developed about Mathematics as an Educational Task.

Assessment:
Progressive assessment based on performance in tutorials, preparation of case study reports and completion of self-evaluation procedures together with a final assessment based on individual interview to discuss the casebook each student is expected to prepare. A statement of attainment will be given to each student. The grade to be awarded is Ungraded Pass.

Case Studies:
These are reports of how individual school pupils have learned mathematics. They record pupil background, pupil learning problems, methods used to diagnose the learning problems, remedial action taken and evaluation procedures used to determine pupil success.
SECTION FOUR

RUSSIAN FOR THE SCIENTIST AND MATHEMATICIAN

Not offered in 1989.

Formal enrolment in this course is not required.

Prerequisite 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.

SECTION FIVE

POSTGRADUATE DEGREE REGULATIONS

Postgraduate Courses

Studies may be undertaken for the following postgraduate qualifications:

Coursework Honours Degrees
- Bachelor of Science (Honours)
- Bachelor of Mathematics (Honours)

Diploma (Postgraduate)
- Diploma in Coal Geology
- Diploma in Mathematical Studies
- Diploma in Psychology
- Diploma in Science

Coursework Master Degrees
- Master of Scientific Studies

Research Degrees
- Master of Mathematics
- Master of Psychology (Clinical)
- Master of Psychology (Educational)
- Master of Science
- Doctor of Philosophy

Bachelor of Science (Honours)

This is a separate degree to the Bachelor of Science (or equivalent qualification). It may be undertaken full-time over one year of study or part-time over two years. To qualify, candidates must pass one of the following subjects: Biology IV, Chemistry IV, Geography IV, Geology IV, Geology/Mathematics IV, Physics IV, Physics/Mathematics IV, Psychology IV, or Psychology/Mathematics IV.

Bachelor of Mathematics (Honours)

This degree is separate from the undergraduate Bachelor of Mathematics degree and may be taken full-time over one year of study or part-time over two years. Students may choose one subject from the following: Mathematics IV, Statistics IV, Mathematics/Economics IV, Mathematics/Geology IV, Mathematics/Physics IV.

Diploma in Coal Geology

Not offered in 1989

This is a specialist postgraduate diploma for graduates of this or another university who have completed a recognised degree including a major sequence in Geology, or equivalent qualification. It is intended for those candidates who wish to enter the coal industry but have insufficient qualifications in the area of Coal Geology. It requires part-time attendance at the University over a minimum period of two years.

Diploma in Mathematical Studies

This course is intended for graduates who wish to study more Mathematics than was available in their first degree. The course is sufficiently flexible to meet most graduates' needs.

Diploma in Science

Graduates completing this postgraduate diploma must undertake a Part IV subject from those subjects offered in the course leading to the degree of Bachelor of Science. Diplomas are awarded under similar conditions to those applying to the Bachelor of Science (Honours).
Master of Scientific Studies
This is a coursework Masters degree which involves both lectures and the pursuit of an investigation which leads to a report. The prerequisite requirement is an Honours degree or a Diploma in Science, or equivalent qualification.

Master of Mathematics
This is a Research degree by thesis requiring original contribution to knowledge in the area of Mathematics or Statistics. Entry would normally require an Honours degree. Enrolment can take place at any time in the year. Scholarships are available (competitively); applications close about October each year.

Master of Psychology (Clinical)/Master of Psychology (Educational)
These degrees are two postgraduate training courses in professional Psychology. Both courses require successful completion of coursework, practicum and research components. Prerequisite for the Master of Psychology (Clinical) course is an Honours degree in Psychology or equivalent, and, for the Master of Psychology (Educational) course, a Bachelors degree majoring in Psychology, a teaching qualification and two years' teaching experience or equivalent.

Applications for admission to the course close on October 1 each year and attendance at interviews is required generally in October/November in the year preceding intake.

Master of Science/Doctor of Philosophy
These are research degrees involving the production of a thesis which advances the state of knowledge in the chosen discipline. Entry requirements are set out in the University Regulations. Prospective candidates should consult the Head of Department in the appropriate specialisation.

Regulations Relating to the Honours Degree of Bachelor of Science

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

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

"course" means the total requirements prescribed from time to time to qualify a candidate for the degree;
"Dean" means the Dean of the Faculty;
"the degree" means the degree of Bachelor of Science (Honours);
"Department" means the Department or Departments offering a particular subject and includes any other body so doing;
"Faculty" means the Faculty of Science and Mathematics;
"Faculty Board" means the Faculty Board of the Faculty.

3. Admission to Candidature
In order to be admitted to candidature for the degree an applicant shall:
(a) have completed the requirements for admission to the ordinary degree of Bachelor of Science or to any other degree approved by the Faculty Board;
(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 Head of the Department offering the honours subject.

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

<table>
<thead>
<tr>
<th>Subject (Honours)</th>
<th>Course Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology IV</td>
<td>Geology/IV</td>
</tr>
<tr>
<td>Chemistry IV</td>
<td>Geophysics IV</td>
</tr>
<tr>
<td>Geography IV</td>
<td>Geology/IV</td>
</tr>
<tr>
<td>Physics IV</td>
<td>Mathematics IV</td>
</tr>
<tr>
<td>Psychology IV</td>
<td>Mathematics/IV</td>
</tr>
</tbody>
</table>

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

(2) To pass the honours subject a candidate shall complete it and pass such examinations as the Faculty Board shall require.

6. Withdrawal
(1) A candidate may withdraw from the honour subject only by informing the Secretary to the University in writing and requesting a certificate of withdrawal.

Regulations Relating to the Honours Degree of Bachelor of Mathematics

1. General
These Regulations prescribe the requirements for the honours degree of Bachelor of Mathematics 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 programme of studies 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 Mathematics (Honours);
"Department" means the Department or Departments offering a particular subject and includes any other body so doing;
"Faculty" means the Faculty of Science and Mathematics;
"Faculty Board" means the Faculty Board of the Faculty.

3. Admission to Candidature
In order to be admitted to candidature for the degree an applicant shall:
(a) have completed the requirements for admission to the ordinary degree of Bachelor of Mathematics of the University of Newcastle or to any other degree approved by the Faculty Board, or have already been admitted to that degree;
(b) have satisfactorily completed any additional work prescribed by the Head of the Department offering the honours subject; and
(c) have obtained approval to enrol given by the Dean on the recommendation of the Head of the Department offering the honours subject.

4. Qualification for Admission to the Degree
To qualify for admission to the degree a candidate shall, in one year of full-time study or two years of part-time study, pass one of the honours subjects listed in the Schedule of Subjects to these Regulations.

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

(2) To pass the honours subject a candidate shall complete it and pass such examinations as the Faculty Board shall require.

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

(2) A candidate who withdraws from the honours subject after the Monday of the third week of second semester shall be deemed to have failed the subject save that, after consulting with the Head of the Department, the Dean may grant permission for withdrawal without penalty.

7. Classes of Honours

There shall be three classes of honours: Class I, Class II and Class III. Class II shall have two divisions, namely Division 1 and Division 2.

8. Relaxing Provision

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

SCHEDULE OF SUBJECTS

Bachelor of Mathematics (Honours)

The prerequisites are to be taken as guides to the required background for candidates with degrees other than Bachelor of Mathematics from this University.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>Mathematics I</td>
<td>Mathematics II, Statistics III, or Computer Science</td>
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<tr>
<td>Statistics I</td>
<td>Statistics III and a Part III subject in either Mathematics or Computer Science</td>
</tr>
<tr>
<td>Economics/Mathematics I</td>
<td>Mathematics IIIA &amp; Economics IIIC</td>
</tr>
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</tr>
<tr>
<td>Mathematics/Psychology I</td>
<td>Mathematics IIIA &amp; Psychology IIIC</td>
</tr>
</tbody>
</table>

Regulations Relating to the Diploma in Coal Geology

Note: The Diploma in Coal Geology is not available in 1989.

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

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

"Department" means the Department of Geology;  
"Diploma" means the Diploma in Coal Geology;  
"Faculty Board" means the Faculty Board of the Faculty of Science and Mathematics;  
"Subject" means the Diploma in Mathematical Studies.

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

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

5. To qualify for the Diploma a candidate shall enrol and shall complete to the satisfaction of the Faculty Board a programme consisting of:  
(a) two projects, each embodying the result of a project, at least one of which shall be field-oriented; and  
(b) two reports, each embodying the result of a project, at least one of which shall be field-oriented.

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

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

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

Regulations Governing to the Diploma in Mathematical Studies

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

2. In these Regulations unless the context or subject matter otherwise indicates or requires:  
"Dean" means the Dean of the Faculty of Science and Mathematics;  
"Diploma" means the Diploma in Mathematical Studies;  
"Faculty Board" means the Faculty Board of the Faculty of Science and Mathematics;  
"Subject" means any part of a candidate's programme of studies for which a result may be recorded.

3. The Diploma shall be awarded in two grades, Diploma in Mathematical Studies with Merit or Diploma in Mathematical Studies.

4. An applicant for admission to candidature for the Diploma shall:  
(a) have satisfied all the Requirements for admission to a degree of the University of Newcastle, or a degree, approved for this purpose by the Faculty Board, or  
(b) in exceptional circumstances have other qualifications approved for this purpose by the Faculty Board.

5. The Faculty Board will appoint an adviser for each candidate.

6. (1) To qualify for the award of the Diploma, a candidate shall, in not less than two years of part-time study or one year of full-time study, pass a programme approved by the Dean comprising Part I, Part II and Part IV subjects totalling not less than 12 units.

(2) The programme shall consist of subjects offered by the Department of Mathematics, the Department of Statistics and the Department of Electrical Engineering and Computer Science or subjects with considerable mathematical content as determined by the Dean, offered by any other Department or Departments. In making such a determination the Dean shall further determine the classification of the subjects as Part I, Part II, Part III or Part IV subjects.

7. A candidate shall not be permitted to count more than three units from Part I subjects.

8. The Faculty Board may approve a Project for inclusion in the candidate's programme, such a project shall have a unit value of 2.

9. (1) To complete a subject a candidate shall attend such lectures, tutorials, seminars and laboratory classes and submit such written work as the Faculty Board may require.  
(2) To pass a subject a candidate shall complete it and pass such examinations as the Faculty Board may require.

10. In order to provide for exceptional circumstances arising in particular cases, the Senate, on the recommendation of the Faculty Board, may relax any provision of these Regulations.
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 and Mathematics; the "Board of Studies" means the Board of Studies in Psychology; and the "Dean" means the Dean of the Faculty of Science and Mathematics.
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 informing the Secretary to the University in writing and the withdrawal shall take effect from the date of receipt of such notification.
6. In exceptional circumstances, the Senate may, on the recommendation of the Faculty Board, relax any provision of these Requirements.

Clinical Specialisation
7. An applicant for registration as a candidate for the Diploma in the Clinical Specialisation shall:
   (a) have satisfied all of the requirements for admission to a Bachelor's degree in the University of Newcastle and have included in the qualifying course for that degree at least one Part III Psychology subject; or
   (b) have satisfied all of the requirements for admission to an equivalent qualification in another university recognised 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.

Educational Specialisation
8. 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, have completed such written and practical work; and pass such examinations as may be prescribed by the Board of Studies.
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.

POSTGRADUATE DIPLOMA REGULATIONS

Regulations Relating to the Diploma in Science
1. These Regulations prescribe the requirements for the Diploma in Science of the University of Newcastle and are made in accordance with the powers vested in the Council under By-law 5.2.1.
2. In these Regulations, unless the context or subject matter otherwise indicates or requires:
   "Department" means the Department offering the subject in which a person is enrolled or is proposing to enrol;
   "Diploma" means the Diploma in Science;
   "Faculty Board" means the Faculty Board of the Faculty of Science and Mathematics;
   "a Part IV subject" means a Part IV subject offered in the course leading to the degree of Bachelor of Science.
3.(1) An applicant for admission to candidacy for the diploma shall have satisfied all the requirements for admission to a degree of the University of Newcastle, or to a degree, approved for this purpose by the Faculty Board, of any other tertiary institution.
   (2) An applicant shall have met such requirements for entry to a Part IV subject as may be prescribed from time to time by the Head of the Department and approved by the Faculty Board or have achieved at another tertiary institution a standard of performance deemed by the Head of the Department to be equivalent.
4.(1) To qualify for the Diploma, a candidate shall enrol and shall complete the Part IV subject to the satisfaction of the Faculty Board.
   (2) Except with the permission of the Faculty Board, the Part IV subject shall be satisfactorily completed in not less than one year of full-time study or not less than two years of part-time study.
5. To complete the Part IV subject a candidate shall attend such lectures, tutorials, seminars and laboratory classes, and submit such written and other work as the Faculty Board may require and pass such examinations as the Faculty Board may prescribe.
6.(1) A candidate may withdraw from the subject only by notifying the Secretary to the University in writing and the withdrawal shall take effect from the date of receipt of such notification.
   (2) A candidate who withdraws from the subject after the third week of second semester shall be deemed to have failed in the subject save that, after consulting with the Head of Department, the Dean may grant permission for withdrawal without penalty.
7. The Diploma shall be awarded in one of three classes, namely Class I, Class II and Class III. Class II shall have two divisions. The Classes shall indicate a level of achievement comparable with that of a candidate for the degree of Bachelor of Science (Honours).
8. The Diploma shall specify the Part IV subject completed.
9. In order to provide for exceptional circumstances arising in
4. To qualify for admission to a degree of Master a candidate shall 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;
(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.(a) 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.
(b) A candidate who withdraws from any subject after the relevant date shall be deemed to have failed in that subject regardless of permission by the Dean to withdraw without penalty.

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 the candidature as it deems fit.

9. In exceptional circumstances arising in a particular case, the Senate, on the recommendation of the Faculty Board, may relax the requirements for admission to a degree of Bachelor with honors or for a degree of Bachelor with second class honors in an appropriate subject; or
in exceptional cases produce evidence of possessing such academic or professional qualifications as may be approved by the Faculty Board.

2. To qualify for admission to the degree a candidate shall complete to the satisfaction of the Faculty Board a programme consisting of:
(a) such examinations and other such work as may be prescribed by the Faculty Board;
(b) a thesis embodying the results of original investigation or design.

3. The programme shall be completed in not less than two years extending to a maximum of five years, provided that the University may extend this period by not more than one year.

5. 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;
(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;
(c) to require the candidate to undertake such further oral, written or practical examinations as the Faculty Board may prescribe;
(d) not to recommend that the candidate be admitted to the degree, in which case the candidature shall be terminated.

9.1 In exceptional circumstances arising in a particular case, the Senate, on the recommendation of the Faculty Board, may relax the requirements for admission to a degree of Bachelor with honors or for a degree of Bachelor with second class honors in an appropriate subject; or
in exceptional cases produce evidence of possessing such academic or professional qualifications as may be approved by the Faculty Board.

2. To qualify for admission to the degree a candidate shall complete to the satisfaction of the Faculty Board a programme consisting of:
(a) such examinations and other such work as may be prescribed by the Faculty Board;
(b) a thesis embodying the results of original investigation or design.

3. The programme shall be completed in not less than two years extending to a maximum of five years, provided that the University may extend this period by not more than one year.

5. 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;
(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;
(c) to require the candidate to undertake such further oral, written or practical examinations as the Faculty Board may prescribe;
(d) not to recommend that the candidate be admitted to the degree, in which case the candidature shall be terminated.

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.

* As present there is no fee payable.
### SCHEDULE 9 — MASTER OF PSYCHOLOGY
#### (CLINICAL)

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

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

   2. (b) 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 completion of all written work submitted by candidates in pursing 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 this degree by the applicant included a major sequence in Psychology.

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

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

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

   (a) attend such lectures, seminars and tutorials and complete to the satisfaction of the Board such written and practical work and examinations as may be prescribed by the Board; and

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

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

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

#### SCHEDULE 10 — MASTER OF PSYCHOLOGY
#### (EDUCATIONAL)

1. (1) The Faculty of Science and Mathematics 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.

3. 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 completion of all written work submitted by candidates in pursing those programmes.

4. 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 prescribed under section 5(a) of this Schedule; 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.

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

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

   (a) attend such lectures, seminars and tutorials, and complete to the satisfaction of the Board such written and practical work and examinations as may be prescribed by the Board; and

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

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

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

### SECTION FIVE — MASTERS DEGREE REGULATIONS

1. (1) A candidate for the degree of Master of Science may be enrolled in either the Faculty of Engineering or the Faculty of Science and Mathematics. 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 and Mathematics 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 programme.

2. To be eligible for admission to candidature in the Faculty of Engineering an applicant shall:

   (a) have satisfied the requirements for admission to a degree with honours in the University of Newcastle or other tertiary institution approved for this purpose by the Faculty Board; OR

   (b) have satisfied the requirements of the Diploma in Science or Equivalent Honours in the University of Newcastle, or an equivalent qualification in another
SECTION FIVE

tertiary institution; or

(iii) in exceptional cases produce evidence of possessing such other qualifications as may be approved by the Faculty Board; and

(b) satisfy the Faculty Board that he is academically competent to undertake the proposed programme.

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

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

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

4. Except with the permission of the Faculty Board the programme shall be completed in not less than one year and not more than four years.

POSTGRADUATE DEGREE SUBJECT DESCRIPTIONS

Note on Subject and Topic Descriptions

The subject and topic outlines and reading lists which follow 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.

Prerequisites are subjects which must be passed before a candidate enrols in a particular subject. The only prerequisites noted for topics are any topics or subjects which must be taken before enrolling in the particular topic. To enrol in any subject which the topic may be part of, the prerequisites for that subject must still be satisfied.

Where a prerequisite is marked as advisory lectures will be given on the assumption that the subject or topic has been completed as indicated.

Corequisites for subjects or topics are those which the candidate must pass before enrolment or be taking concurrently.

Examination Under examination regulations “examination” includes mid-year examinations, assignments, tests or any other work by which the final grade of a candidate in a subject is assessed. Some attempt has been made to indicate for each subject how assessment is determined. See particularly the general statement in the Department of Mathematics section headed “Progressive Assessment” referring to Mathematics Subjects.

Texts are essential books recommended for purchase.

References are books relevant to the subject or topic which, however, need not be purchased.

714100 BIOLGY IV

Prerequisites Completion of Ordinary Degree requirements and permission of the Head of the Department.

Content Carry out a research project and complete a thesis, essay, viva and two seminars.

724100 CHEMISTRY IV

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

Hours To be advised

Examination 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.

Content A subject extending over one full-time academic year or its part-time equivalent, comprising:

(i) a minimum of 40 hours of lectures and tutorials, a course of directed reading and presentation of a seminar on an assigned topic;

(ii) a supervised research project, the results of which are to be embodied in a thesis and presented at a seminar.

Text To be advised
Prerequisites Geology IIIA, completion of ordinary degree requirements and permission of the Head of the Department.

Hours To be advised.

Examination (iv) such other work, e.g. seminars, assignments, earlier

734100 GEOLOGY IV

Lecture-tutorial work with directed reading in the following requirements and permission of the Head of the Department.

Prerequisites (iv) such other work, e.g. seminars, assignments, earlier

734210 ECONOMICS/MATHEMATICS IV

Prerequisites Mathematics IIIA and Economics IIIIC 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 before 7th December of the preceding year.

Hours To be advised.

Content At least four topics chosen from those available to honours students in Mathematics for the current year together with work offered by the Department of Geography 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.

746100 PHYSICS IV

Prerequisite Physics IIIA. Attention is drawn to degree requirements for Honours. Normally a pass in Physics IIIA at the level of credit or better is required.

Hours 115 lecture hours and a research project, or their equivalent.

Content Physics IV is intended to give students an advanced understanding of the fundamentals of modern physics appropriate for an Honours graduate usually discarding any exposure to material of a more elementary nature. The student is expected to cover such fields in semester length units as normal and clinical psychology, animal behaviour, social psychology, developmental psychology, health psychology, learning and development, motivation, perception, personality, scientific methodology and social psychology. Students will be allocated to Seminars in February 1989.

754100 PSYCHOLOGY IV

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

Hours To be advised.

Examination Assessment of the project undertaken and worth 25% of the final assessment.

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

794100 STATISTICS IV

Prerequisites Statistics III and a Part III subject in either Mathematics or Computer Science

Hours Approximately 6 lecture hours per week and completion of a substantial project

Examination Six 2-hour examinations or equivalent assignments each worth 10% of the final assessment, and a thesis relating to the project undertaken and worth 40% of the final assessment.

Content At least 8 eight Part IV topics. The topics offered may be chosen from any branch of Mathematics including Pure Mathematics,

78 Applied Mathematics, Statistics, Computer Science and Operations Research as exemplified in the publication Mathematical Reviews. Summaries of some topics are given later in this section of the Handbook, but the Department should be consulted for further details, including the current list of suitable topics from other Departments.

Content A selection of at least eight Part IV topics. The topics offered may be chosen from any branch of Mathematics including Pure Mathematics,

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. Test To be advised by the lecturers concerned.

664300 MATHEMATICS/PHYSICS IV

Prerequisites Physics IIIA & Mathematics IIIA

Hours To be advised and, in addition, a research project within the Departments of Physics and/or Mathematics which may be jointly supervised.

Examination Assessment will be in the appropriate Physics IV and Mathematics IV topics selected. In addition the research project will be assessed on the basis of a written report and a seminar on the project.

Content Four topics from Mathematics IV chosen for relevance to Physics, and topics from Physics IV, as approved by the Head of the Department of Physics. Project work will normally begin in the first week of February.

754300 PSYCHOLOGY IV

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

Hours To be advised.

Examination Assessment of the project undertaken and worth 25% of the final assessment.

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

794100 STATISTICS IV

Prerequisites Statistics III and a Part III subject in either Mathematics or Computer Science

Hours Approximately 6 lecture hours per week and completion of a substantial project

Examination Six 2-hour examinations or equivalent assignments each worth 10% of the final assessment, and a thesis relating to the project undertaken and worth 40% of the final assessment.

Content At least 8 eight Part IV topics. The topics offered may be chosen from any branch of Mathematics including Pure Mathematics,

78 Applied Mathematics, Statistics, Computer Science and Operations Research as exemplified in the publication Mathematical Reviews. Summaries of some topics are given later in this section of the Handbook, but the Department should be consulted for further details, including the current list of suitable topics from other Departments.

Content A selection of at least eight Part IV topics. The topics offered may be chosen from any branch of Mathematics including Pure Mathematics,
Students are also required to complete a substantial project. The results of the project, worth 40% of the final assessment, must be embodied in a thesis. The project may be a practical one involving the analysis of data, or a theoretical one. Work on the project normally starts early in February.

The list of topics available for Statistics IV other than those offered by the Department of Statistics, the Department of Mathematics or the Department of Computer Science is as follows:

- Management Science A and Management Science B offered by the Department of Management.

**PART IV MATHEMATICS TOPICS**

**Note:**
A meeting will be held on the first Tuesday of the first semester in Room V107 at 1:00 pm to determine the timetable for Mathematics IV topics and the topics to be offered for the year.

Other topics than those listed here will be offered from time to time by visitors to the Department. Intending students should consult the Department early in the year regarding them.

**664168 ASTROPHYSICAL APPLICATIONS OF MAGNETOHYDRODYNAMICS**

**Prerequisites:** Topics CO and PD

**Hours:** About 27 lecture hours

**Examination:** One 2-hour paper.

**Content:**
The normal state of matter in the universe is that of a plasma, or ionized gas, permeated by magnetic fields. Moreover, these fields (unlike that of the earth) may be dominant, or at least significant, in controlling the structure of the region. The aim of this course is to investigate the effects of astrophysical magnetic fields, ranging from 10^16 gauss in the galaxy to 10^18 gauss in a supernova remnant.

**Text:**
Zelinski, W. Banach Algebras (Elementary, 1973)

**References:**
Naimark, M.A. *Normed Rings* (Nordhoff, 1959)
Rickart, C.E. General Theory of Banach Algebras (Van Nostrand, 1960)
Simmonds, G.F. Introduction to Topology and Modern Analysis (McGraw-Hill, 1963)
Williams, A. Functional Analysis (Blaisdell, 1964)

**664158 CONVEX ANALYSIS**

**Course Topic:** W

**Hours:** About 27 lecture hours

**Examination:** One 2-hour paper.


**References:**
Croxton, C.A. Introduction to Atomic Physics (Wiley, 1975)
Valentine, F.A. Convex Sets (McGraw-Hill, 1964)
Williams, A. Functional Analysis (Blaisdell, 1964)

**664192 FLUID STATISTICAL MECHANICS**

**Prerequisite:** Nil

**Hours:** About 27 lecture hours

**Examination:** One 2-hour paper.

**Content:**
Cluster-diagrammatic expansions - low density solutions; integrable differential equations (BGV, HNC, PVA) - high density solutions; quantum liquids - Wu-Ferber fermion extension; numerical solution of integral equations; phase transitions - diagrammatic approach; critical phenomena; the liquid surface; liquid metals; liquid crystals; molecular dynamics and Monte Carlo computer simulation; irreversibility; transport phenomena; Polymeric systems.

**Text:**

**References:**
Brons, V. & Preparata, F.P. *Convexity and Optimization in Banach Spaces* (Sijhoff & Noordhoff, 1978)

**664159 FOUNDATIONS OF MODERN DIFFERENTIAL GEOMETRY**

**Prerequisite:** Topic CO

**Hours:** About 27 lecture hours

**Examination:** One 2-hour paper.

**Content:**

**Text:**
Nil

**References:**

**664179 HISTORY OF ANALYSIS TO AROUND 1900**

**Prerequisite:** Nil

**Hours:** About 27 lecture hours

**Examination:** One 2-hour paper.

**Content:**
A course of 26 lectures on the history of mathematics with emphasis on analysis. Other branches of mathematics will be
referred to for putting the analysis into context. Where feasible, use will be made of original material, in translation. The course will be assessed by essays and a final 2-hour examination.

Topics to be covered include: pre-Greek concepts of exactness and approximation; Greek concepts of continuity, irrationality, infinity, infinitesimal, magnitude, ratio, proportion and their treatment in Elements V, XI and the works of Archimedes; developments of number systems and their equivalents; scholastic mathematics; virtual motion; Renaissance quadrature/cubature by infinitesimals and by "geometry"; Cartesian geometry: 17th and 18th century calculus; rigourization of analysis in the 19th century with stress on the developments of number systems, continuity, function concept, differentiability, integrability.

Text Nil

References

Lists will be presented during the course.

Students interested in this or other topics on aspects of the History of Mathematics should approach the lecturer concerned as soon as possible.

664165 MATHEMATICAL PHYSIOLOGY

Prerequisite Nil

Hours About 27 lecture hours

Examination One 2-hour paper.

Content

Physiology - the study of how the body works based on the knowledge of how it is constructed - essentially dates from early in the seventeenth century when the English physician Harvey showed that blood circulates constantly through the body. The intrusion of engineering into this field is well known through the wide publicity given to (for example) hean

 pw...
### Viscous Flow Theory

**Prerequisite:** Topic Q
**Hours:** About 27 lecture hours
**Examination:** One 2-hour paper.

**Content**
- Basic equations. Some exact solutions of the Navier-Stokes equations. Approximate solutions: theory of very slow motion, boundary layer theory, etc.

**Text**
- Batchelor, G.K. *An Introduction to Fluid Dynamics* (Cambridge, 1967)

**References**
- Batchelor, G.K. *An Introduction to Fluid Dynamics* (Cambridge, 1967)

### Analysis of Categorical Data

**Prerequisite:** Statistics III or equivalent topics
**Hours:** About 27 hours
**Examination:** Assignments and one major project.

**Content**
The course will discuss the analysis of categorical data. It will begin with a thorough coverage of 2 x 2 tables before moving on to larger (rxc) contingency tables. Topics to be covered include probability models for categorical data, measures of association, measures of agreement, the Mantel-Haenszel method for combining tables, applications of logistic regression and log-linear models.

**References**

### Demography and Survival Analysis

**Prerequisite:** Statistics III or equivalent topics
**Hours:** About 27 hours

**Content**
- This course presents a mathematical treatment of the techniques used in population projections, manpower studies, and the survival models used in demography and biostatistics.

**Text**

**References**
**SECTION SEVEN**

**SUBJECT COMPUTER NUMBERS**

Computer Numbers must be shown on enrolment and course variation forms in the following manner. Candidates wishing to enrol in any subject not listed should consult the Faculty Secretary.

**Bachelor of Science/Bachelor of Mathematics Subjects**

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**Part I Subjects**

**Part II Subjects**

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**SECTION SEVEN**

**SUBJECT COMPUTER NUMBERS**

Computer Numbers must be shown on enrolment and course variation forms in the following manner. Candidates wishing to enrol in any subject not listed should consult the Faculty Secretary.

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### Computer Numbers

Computer Numbers must be shown on enrolment and course variation forms in the following manner. Candidates wishing to enrol in any subject not listed should consult the Faculty Secretary.

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<td>Components to be selected after consultation and approval be the Head of the Department of Economics and the Dean of the Faculty of Science and Mathematics.</td>
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<td>743200</td>
<td>PHYSICS IIIB (Not offered in 1989)</td>
<td></td>
</tr>
</tbody>
</table>

### Bachelor of Science (Honours) and Bachelor of Mathematics (Honours) Subjects

Computer Numbers must be shown on enrolment and course variation forms in the following manner. Candidates wishing to enrol in any subject not listed should consult the Faculty Secretary.

<table>
<thead>
<tr>
<th>Computer Number</th>
<th>Subject Name</th>
<th>Names of Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>693100</td>
<td>STATISTICS III</td>
<td></td>
</tr>
</tbody>
</table>

Bachelor of Science (Honours) and Bachelor of Mathematics (Honours) Subjects

- **BIOLOGY IV**
- **CHEMISTRY IV**
- **MATHEMATICS IV**
- **MATHEMATICS/ECONOMICS IV**

### Component Names

- **SS**: Survey Sampling
- **TSA**: Time Series Analysis
- **SI**: Statistical Inference
- **GS**: General Semantics
- **SS**: Survey Sampling
- **TSA**: Time Series Analysis
- **SI**: Statistical Inference
- **GS**: General Semantics

### Sections

- **SECTION SEVEN**
- **SECTION EIGHT**