FACULTY OF
SCIENCE
AND MATHEMATICS

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Volume 1 — Legislation
Volume 2 — University Bodies and Staff
Volume 3 — Faculty of Architecture Handbook
Volume 4 — Faculty of Arts, Design and Communication Handbook
Volume 5 — Faculty of Arts Handbook
Volume 6 — Faculty of Economics and Commerce Handbook
Volume 7 — Faculty of Education Handbook
Volume 8 — Faculty of Engineering Handbook
Volume 9 — Faculty of Health Sciences Handbook
Volume 10 — Faculty of Law Handbook
Volume 11 — Faculty of Medicine Handbook
Volume 12 — Faculty of Music Handbook
Volume 13 — Faculty of Nursing Handbook
Volume 14 — Faculty of Science and Mathematics Handbook
Volume 15 — Faculty of Social Science Handbook

Also available are the Undergraduate Guides

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 of Bachelor of Mathematics of this University.

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THE DEAN’S FOREWORD

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

Undergraduate Degrees handled by the Faculty include the Bachelor of Science, Bachelor of Science (Aviation), Bachelor of Science (Psychology), Bachelor of Mathematics, Bachelor of Applied Science (Environmental Assessment and Management), Bachelor of Environmental Science and a number of combined degrees with other Faculties.

This Handbook provides details relating to these degrees.

Students enrolled in a Science or Mathematics degree should be aware that they can apply to take subjects in Computer Science (offered within the Faculty of Engineering) but because of strict quota restrictions on entry to Computer Science 101, may not be successful in gaining a place. Subjects from Statistics, Information Science and a number of other disciplines can be pursued within the various degree programs. In the Bachelor of Science and Bachelor of Mathematics degrees, students may take a sequence of subjects from outside the Faculty, thus combining expertise in basic science and/or mathematics with a wide range of elective areas such as languages and other humanities, accountancy, management, computing and engineering.

Those students entering university for the first time will find the system of instruction vastly different from that in secondary schools. The responsibility 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 presented. 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 issues will be important for your ultimate success. The first is the development of an efficient note taking system and in this you should seek the assistance of the Student Counselling Unit which provides relevant short courses. The second is that, apart from regular tutorials, tests, and final examinations, no one will follow up your comprehension of the lecture material other than yourself. The Faculty expects you to spend at least one hour of your time on private study for every contact hour that you have with University staff. You need to allocate this from the very beginning of your course and if you delay the process you will probably never make up the lost time. A well planned, uniform program of work to support your lectures, tutorials and laboratory classes will allow you to develop your understanding of the subjects and enjoy the many other facets of university life.

The quality of your tertiary education depends upon your ability to make efficient use of the University Library. Ensure that you take part in the orientation programs which the Library staff offer at the beginning of every year. Throughout your course the teaching and administrative staff of the University are here to guide you and if you need assistance it is available at a number of levels. Difficulties with particular subjects should be discussed with the lecturer or tutor concerned or the Year Supervisor in each Department. Problems with your degree structure and progression are the province of the Assistant Deans and the Dean who will give guidance when required. Day to day changes in your current enrolment are handled by the Assistant Registrar who can be found in the School Office which is located in the Science Building adjoining Chemistry.

In a climate where government charges for tertiary education have risen steeply, you must make the most of your time at University by using its resources to the full. Learn to organise 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 career and satisfying life.

D.C. FINLAY,
Dean
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FACULTY INFORMATION

The Faculty of Science and Mathematics comprises the Departments of Applied Science and Technology, Aviation, Biological Sciences, Chemistry, Geography, Geology, Mathematics, Physics and Psychology. The Departments of Computer Science, Physics 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.

Transition Arrangements: Exceptional Circumstances

In order to provide for exceptional circumstances arising in particular transition cases, the Dean may determine the transition program to be followed.

General 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 etc.) 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 semester subjects (100 level 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 prescribed subjects, prerequisites and corequisites as set out in the appropriate degree/ diploma Rules in this handbook.

Students should note that degrees must be structured to include a specified number of 300 level subjects. For example, a Bachelor of Science degree must include forty credit points at 300 levels in one Department, and at least forty more credit points at 300 level chosen from subjects approved by Faculty Board. Subject to the Dean's permission, a candidate may be permitted to enrol in some subjects from amongst those offered by another Faculty.

Time limits are set on the duration of an undergraduate course as indicated in the appropriate Rules. 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 Rules.

Undergraduate Admission Requirements

In order to be considered for admission for any qualification other than a postgraduate qualification an applicant shall be required to either

(i) attain such aggregate of marks in approved subjects at the New South Wales Higher School Certificate examination as may be prescribed by the Senate from time to time; or

(ii) otherwise satisfy the Admissions & Progression Committee that the applicant has reached a standard of education sufficient to enable the approved course to be pursued.

Assumed Knowledge 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.
Subject

Aviation 109-115
2-unit, 3-unit or 4-unit Mathematics. Also, 2-unit Physics or 4-unit Science (including the Physics 'make-up' electives) with a level of performance placing them in the top 50% of the Faculty for these subjects.

Biology 101
Higher School Certificate Chemistry or 4-unit Science is approved and students are advised to include CHEM101 and CHEM102 in their University program. However, some lectures in background chemistry will be offered by the Department of Community Programmes prior to the start of the first semester. Attendance at this Preparatory Course is optional.

Chemistry 101
At least Mathematics (2-unit course), Chemistry (2-unit course), and Physics (2-unit course), with ranking in the top 50% in each case.

Mathematics 111
Mathematics (2-unit course), or higher.

Mathematics 102
Mathematics at 3-unit level with a score of at least 120/150 in 3-unit, or have passed Mathematics 111

Physics 101
HSC 2-unit Mathematics with a performance level in the top 50% of the candidate for this subject.

Physics 102
HSC 3-unit Mathematics mark of at least 110/150, Physics 2-unit Science or 4-unit Science with a performance level in the top 50% of candidate for these subjects.

Mature Age Entry
Entry into the University is available to persons who will be at least 21 years of age by 1st March of the year in which enrolment is sought and who have completed a limited New South Wales Higher School Certificate Program. Subjects which will enable entry into the Faculty of Science and Mathematics include four units selected from Physics, Chemistry, Mathematics (3-unit course preferred), and at least two units of Mathematics. For entry into the Bachelor of Mathematics degree, include 3-unit mathematics (attaining a result of at least 120/150) and one other subject recognised for admission purposes. For other degrees, the subjects should be presented as 2-unit courses with a result in the top 50%.

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.

Enrolment Requirements
(a) In order to be admitted an applicant shall:
(i) satisfy appropriate Diploma/Degree Rules as set out in Section Three;
(ii) receive approval to enrol;
(iii) complete the prescribed enrolment procedures; and
(iv) pay any fees and charges prescribed by the Council.

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

(c) 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.

(d) A candidate for a qualification shall not enrol in a course or part of a course for another qualification unless the candidate 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 degree course approved by the Senate leading to two qualifications.

(e) A candidate for any qualification other than a postgraduate qualification who is enrolled in three courses or more of a normal full-time program 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 program 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.

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 or her original degree course, in consultation with the Dean of the Faculty responsible for the degree. Permission to embark on a combined degree course will normally require an average of credit points from first-year subjects.

Non-Degree Students
Notwithstanding anything to the contrary contained in these Regulations, the Admissions & Progression 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 fees and charges as may be prescribed by the Council. A person so enrolling shall be designated a 'non-degree' student.

Policy Faculty in Regard to Credit for Courses Completed Elsewhere
The Faculty Board may grant Credit in specified and unspecified semester subjects, aggregating to a maximum of 120 credit points, to a candidate in applicant in the case of work completed to this Faculty or another approved tertiary institution, on conditions determined by the Faculty Board. Such Credit to be granted may include no more than 100 credit points at 100 level, 40 credit points at 200 level or 20 credit points at 300 level.

Additional Information
Advisory Services
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 Assistant Deans or Dean.

Enquiries regarding enrolment, variation to program and general administrative problems should be directed to the Faculty Secretary in the School of Science. 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 on Departmental and Faculty Boards as well as to other University bodies. Election of student members usually takes place in Semester One 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.

The timetable for one particular subject may clash with that of another, this may not necessarily mean that this combination cannot be done. Often an arrangement can be made by one or both Departmental representatives to overcome this problem.

Therefore, see the Departmental representatives before deciding upon your final subject combinations.

Workload
The expected maximum workload for students devoting most of their time to degree studies is 40 credit points per semester. Enrolment in more than 40 credit points per semester is only permitted in exceptional circumstances by students with a good academic record and requires the permission of the Dean.

Students with external commitments, such as part-time employment, should enrol in fewer subjects. Such commitments cannot be taken into consideration for an extension of time for written work, or failure to attend examinations some of which may be scheduled on Saturday mornings.

Student Academic Progress
All students are reminded of the need to maintain satisfactory progress and, in particular, attention is drawn to the Rules Governing Unsatisfactory Progress. The following should be borne in mind

1. The Faculty Board requires that students shall pass at least two semester subjects 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 have passed at least eight semester subjects by 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 semester subject twice shall not be permitted to include that subject in the candidate's future program, and that a student who fails four semester subjects twice shall be excluded from further enrolment in the Faculty, unless the candidate shows cause to the satisfaction of the Faculty Board why the candidate should be permitted to do so.

4. Students should note that a terminating pass can be awarded only at the 100 level or 200 level and that no more than four terminating passes, may count in a student’s program (with no more than two at the 200 level)

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

Examination Rules
These Rules are printed in the centre grey pages of this Handbook.

Unsatisfactory Progress
Additional Rules are printed in the centre grey pages of this Handbook.

Record of Failure
An applicant who has a record of failure at another tertiary institution shall not be admitted unless the applicant satisfies (a) the Faculty Board or the Graduate Studies Committee for the Faculty as appropriate, in the case of a postgraduate qualification; or

(b) the Admissions & Progression Committee, in the case of any other qualification that there is a reasonable prospect that the applicant will make satisfactory progress.

Teacher Training Courses
Prerequisites for Diploma in Education Units
Students who intend to proceed to a Diploma in Education should familiarise themselves with the prerequisites for units offered in the course.

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

11
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.

All secondary methods

Normally at least 50 credit points (20-100;50-200 level) of a degree in the main teaching area and 20 credit points (20-100 level) of a degree in any subsidiary area. Modern Languages, Drama, Science and Social Sciences have additional specific requirements.

Primary method

At least 50 credit points (20-100;30-200 level) of a degree in a specified area and 20-100 level credit points of a degree in each of two others. The specified area is usually a secondary teaching area.

Further details may be obtained from the Faculty Secretary, Faculty of Education.

Role of Faculty Board, Faculty of Science and Mathematics

The role of the Faculty Board, Faculty of Science and Mathematics is defined by Faculty Board Rule 7 which states:

- Subject to any resolution of the Council or the Academic Senate, and any provisions of any Rules, a Faculty Board shall:
  - (a) encourage and supervise the teaching, assessment and research activities of the Faculty;
  - (b) make recommendations to the Academic Senate on any matter affecting the Faculty;
  - (c) determine the grades of pass to be used for subjects offered in the courses for which the Faculty is responsible;
  - (d) consider the examination results recommended in respect of each of the candidates for which the Faculty is responsible and take action in accordance with the prescribed procedures;
  - (e) make recommendations on matters concerning admissions, enrolment and progression in the courses for which the Faculty is responsible to the Admissions and Progression Committee; and
  - (f) deal with any matter referred to it by the Academic Senate.

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.
SECTION THREE

UNDERGRADUATE DEGREE AND DIPLOMA RULES

Undergraduate Diploma & Degrees offered in the Faculty of Science and Mathematics
Bachelor of Applied Science Environmental Assessment and Management
Bachelor of Science (Aviation)
Bachelor of Environmental Science
Bachelor of Science
Bachelor of Science (Psychology)
Bachelor of Mathematics
Diploma in Aviation Science

Rules Governing Academic Awards

1 Application of Rules

These rules shall apply to all the academic awards of the University other than the degrees of Doctor and Master.

2 Interpretation

(1) In these rules, unless the context or subject matter otherwise indicates or requires:

“award” means the degree, diploma (including graduate diploma and associate diploma) or graduate certificate for which a candidate is enrolled;

“course” means the total requirements of the program of study approved by the Academic Senate to qualify a candidate for the award as set out in the schedule;

“Dean” means the Dean of a Faculty;

“department” means the department offering a particular subject and includes any other body so doing;

“Faculty” means the Faculty responsible for the course;

“Faculty Board” means the Faculty Board of the Faculty;

“schedule” means the schedule to these rules relevant to the award listed under the name of the Faculty;

“subject” means any part of a course for which a result may be recorded.

(2) A reference in these rules to a Head of Department shall be read not only as a reference to the person appointed to that office but also, where a subject is not offered by a department as such, to the person approved by the Academic Senate to undertake the responsibilities of a Head of Department for the purpose of these rules.

3 Admission

An applicant for admission to candidature for an award shall satisfy the requirements of the University governing admission to and enrollment in a course and any other additional requirements as may be prescribed in the schedule for that award.

4 Subject

(1) For the purpose of a course, a subject may be classified at a level determined by the Faculty Board.

(2) Each subject shall be allotted a credit point value by the Academic Senate after considering the advice of the Faculty Board of the Faculty in which the department is located.

(3) The Academic Senate, after considering a request from a Faculty Board, may determine that a subject be not offered during a particular academic year.

(4) The Faculty Board shall approve the subjects for the award. Any change in the list of approved subjects which will have effect in the following year shall be approved by a date determined by the Academic Senate.

(5) Where there is any change in the list of approved subjects, the Faculty Board shall make all reasonable provision to permit students already enrolled in the course to progress normally.

5 Enrolment

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

(2) Except with the permission of the Dean and subject to any contrary provision in the schedule

(a) a candidate may not enrol in subjects totalling more than the equivalent of 40 credit points in any semester;

(b) a candidate shall not enrol in a subject which does not count towards the award;

(c) a candidate shall not be permitted to enrol in any subject which is substantially equivalent to one which that candidate has previously counted towards a degree or diploma.

(3) A candidate for an award shall not enrol in a course or part of a course for another award in this University unless consent has first been obtained from the Dean and, if another Faculty is responsible for the course leading to that other award, the Dean of that Faculty, provided that a student may enrol in a combined course approved by the Academic Senate leading to two awards.

6 Prerequisites and Corequisites

(1) The Faculty Board on the recommendation of the Head of the Department may prescribe prerequisites and/or corequisites for any subject offered by that Department.

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

(3) Except with the permission of the Dean, a candidate will not have satisfied a prerequisite if the prerequisite subject has not been completed in the preceding eight calendar years.

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

7 Credit

(1) A Faculty Board may grant credit to a candidate in specified and unspecified subjects, on such conditions as it may determine, in recognition of work completed in the University or another institution approved by the Faculty Board for this purpose.

(2) Except as may be otherwise provided in the schedule, a candidate shall not be given credit for more than sixty-five percent of the total number of credit points required to complete the course.

8 Subject Requirements

(1) The subjects which may be completed in the course for the award shall be those approved by the Faculty Board and published annually as the Approved Subject Schedule in the schedule.

(2) A candidate enrolled in a subject shall comply with such academic and practical requirements and submit such written or other work as the Department shall specify.

(3) Except as otherwise permitted by the Head of Department, any material presented by a candidate for assessment must be the work of the candidate and not have been previously submitted for assessment.

(4) To complete a subject a candidate shall satisfy published departmental requirements and gain a satisfactory result in such assessments and examinations as the Faculty Board shall require.

9 Withdrawal

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

(2) A student shall be deemed not to have enrolled in a subject if that student withdraws from the subject

(a) in the case of a semester length subject, before the Higher Education Contribution Scheme census date for that semester, or

(b) in the case of a full year subject, before the first Higher Education Contribution Scheme census date for that academic year.

(3) Except with the permission of the Dean

(a) a candidate shall not be permitted to withdraw from a subject after the relevant date which shall be:

(i) in the case of a semester length subject, the last day of that semester; or

(ii) in the case of a full year subject, the last day of second semester;

(b) a candidate shall not be permitted to withdraw from a subject on more than two occasions.

10 Absence

Subject to any provision in the schedule, a candidate in good academic standing in the course

(a) may take an absence of one year from the course, or

(b) with the permission of the Dean, may take an absence of two consecutive years from the course without prejudice to any right of the candidate to re-enrol in the course following such absence.

11 Qualification for the Award

To qualify for the award a candidate shall satisfactorily complete the requirements governing the course prescribed in the schedule.

12 Combined Degree Programs

(1) Where so prescribed for a particular course, a candidate may complete the requirements for one Bachelor degree
in conjunction with another Bachelor degree by completing a combined degree program approved by the Academic Senate on the advice of the Faculty Board and, where the other Bachelor degree is offered in another Faculty, the Faculty Board of that Faculty.

(2) Admission to a combined degree program shall be restricted to candidates who have achieved a standard of performance deemed satisfactory for the purposes of admission to the specific combined degree course by the Faculty Board(s).

(3) The work undertaken by a candidate in a combined degree program shall be no less in quantity and quality than if the two courses were taken separately.

(4) To qualify for admission to the two degrees a candidate shall satisfy the requirements for both degrees, except as may be otherwise provided.

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

SCHEDULE — BACHELOR OF APPLIED SCIENCE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT

1 Qualification for the Degree
(1) To qualify for admission to the degree, candidates shall pass subjects totalling 240 credit points selected from the list of Approved Subjects, including the prescribed subjects unless the Faculty Board approves otherwise in a particular case.

(2) The subjects passed shall include:
(a) at least 80 credit points from 100 level subjects;
(b) at least 60 credit points from 200 level subjects;
(c) at least 80 credit points from 300 level subjects; and
(d) 20 credit points from approved electives.

2 Credit
(1) Credit may be granted for studies completed which qualified the candidate for an award of the University or for studies completed at another institution up to a total of 120 credit points including not more than:
(a) 100 credit points at the 100 level;
(b) 40 credit points at the 200 level; and
(c) 20 credit points at the 300 level.

(2) Credit may be granted for all subjects completed in the University which have not already been counted towards a completed award.

3 Time Requirements
(1) Except with the permission of the Faculty Board, a candidate shall complete the course within nine years of study.

(2) A candidate granted credit shall be deemed to have commenced the course from a date determined by the Dean at the time at which credit is granted.

APPROVED SUBJECTS
The subjects approved by the Faculty Board for the award are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>Prerequisite</th>
<th>Corequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAMS101</td>
<td>Concepts of Ecology</td>
<td>10</td>
<td>EAMS101</td>
<td></td>
</tr>
<tr>
<td>EAMS111</td>
<td>Systems Approach to Ecology</td>
<td>10</td>
<td>EAMS101</td>
<td>EAMS111</td>
</tr>
<tr>
<td>EAMS102</td>
<td>Monitoring and Statistics I</td>
<td>10</td>
<td>EAMS102</td>
<td></td>
</tr>
<tr>
<td>EAMS112</td>
<td>Monitoring and Statistics II</td>
<td>10</td>
<td>EAMS112</td>
<td></td>
</tr>
<tr>
<td>EAMC103</td>
<td>Contemporary Environmental Philosophy</td>
<td>10</td>
<td>EAMC103</td>
<td></td>
</tr>
<tr>
<td>EAMC113</td>
<td>Environment and Human Values I</td>
<td>10</td>
<td>EAMC113</td>
<td></td>
</tr>
<tr>
<td>EAMS104</td>
<td>Environmental Planning and Pollution</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EAMS114</td>
<td>Local and Regional Environmental Issues</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EAMS201</td>
<td>Agricultural Systems</td>
<td>10</td>
<td>EAMS101/111</td>
<td>EAMS201</td>
</tr>
<tr>
<td>EAMS211</td>
<td>Industrial and Urban Systems</td>
<td>10</td>
<td>EAMS101/111</td>
<td>EAMS211</td>
</tr>
<tr>
<td>EAMS202</td>
<td>System Dynamics and Data Analysis I</td>
<td>10</td>
<td>EAMS102/112</td>
<td>EAMS202</td>
</tr>
<tr>
<td>EAMS212</td>
<td>System Dynamics and Data Analysis II</td>
<td>10</td>
<td>EAMS102/112</td>
<td></td>
</tr>
<tr>
<td>EAMC203</td>
<td>Environment and Human Values II</td>
<td>10</td>
<td>EAMC113/113</td>
<td></td>
</tr>
<tr>
<td>EAMC213</td>
<td>Development and Social Impact Assessment</td>
<td>10</td>
<td>EAMC110/113</td>
<td>EAMC203</td>
</tr>
<tr>
<td></td>
<td>Hydrology and Soils Analysis</td>
<td>10</td>
<td>EAMS102/112</td>
<td>EAMS290</td>
</tr>
<tr>
<td>EAMS291</td>
<td>Water Resources Management</td>
<td>10</td>
<td>EAMS102/112</td>
<td></td>
</tr>
<tr>
<td>EAMS292</td>
<td>Plant Systematics and Plant Ecology</td>
<td>10</td>
<td>EAMS101/111</td>
<td></td>
</tr>
<tr>
<td>EAMS293</td>
<td>Animal Systematics and Animal Ecology</td>
<td>10</td>
<td>EAMS101/111</td>
<td>EAMS292</td>
</tr>
<tr>
<td></td>
<td>Regional and National Environmental Issues</td>
<td>10</td>
<td>EAMS104/114</td>
<td></td>
</tr>
<tr>
<td>EAMS301</td>
<td>Environmental Management I</td>
<td>10</td>
<td>EAMS201, EAMS211</td>
<td>EAMS301</td>
</tr>
<tr>
<td>EAMS311</td>
<td>Environmental Management II</td>
<td>10</td>
<td>EAMS201, EAMS211</td>
<td></td>
</tr>
<tr>
<td>EAMS302</td>
<td>Specialist Study</td>
<td>20</td>
<td>All Prescribed 200 level subjects</td>
<td></td>
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<tr>
<td>EAMS304</td>
<td>Regional and National Environmental Issues</td>
<td>10</td>
<td>EAMS104/114</td>
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<tr>
<td>EAMS314</td>
<td>Environmental Impact Assessment</td>
<td>10</td>
<td>EAMS104/114</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soil Conservation and Management</td>
<td>10</td>
<td>EAMS290, EAMS291</td>
<td>EAMS390</td>
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<tr>
<td>EAMS391</td>
<td>Water and Soils: Applications and Modelling</td>
<td>10</td>
<td>EAMS290, EAMS291</td>
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<tr>
<td>EAMS392</td>
<td>Flora Component of Environmental Impact Assessment</td>
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<td>EAMS292, EAMS293</td>
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<tr>
<td>EAMS393</td>
<td>Fauna Component of Environmental Impact Assessment</td>
<td>10</td>
<td>EAMS292, EAMS293</td>
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<td>EAMC303</td>
<td>Occupational Hygiene and Toxicology</td>
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<td>EAMC203, EAMC213</td>
<td>EAMC303</td>
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<tr>
<td>EAMC313</td>
<td>Social Aspects of Environmental Health</td>
<td>10</td>
<td>EAMC203, EAMC213</td>
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</tr>
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</table>

Footnotes
The normal pattern for the Bachelor of Applied Science Environmental Assessment and Management degree is 80 credit points at 100 level, 80 credit points at 200 level and 80 credit points at 300 level.

Leave of Absence — For the purposes of Rule 10 of the Rules Governing Academic Awards, a candidate shall be deemed to be in good standing if, at the conclusion of the year of last enrolment in the course, that candidate was eligible to re-enrol without restrictions.
SECTION THREE

SCHEDULE - BACHELOR OF ENVIRONMENTAL SCIENCE

1 Qualification for the Degree

(1) To qualify for admission to the degree, candidates shall pass subjects totalling 240 credit points selected from the list of Approved Subjects including the prescribed subjects unless the Faculty Board approves otherwise in a particular case.

(2) The subjects passed shall include:

(a) at least 80 credit points from 100 level subjects;
(b) at least 60 credit points from 200 level subjects; and
(c) at least 80 credit points from 300 level subjects.

2 Credit

(1) Credit may be granted for studies completed which qualified the candidate for an award of the University or for studies completed at another institution up to a total of 120 credit points including not more than:

(a) 100 credit points at the 100 level;
(b) 40 credit points at the 200 level; and
(c) 20 credit points at the 300 level.

(2) Credit may be granted for all subjects completed in the University which have not already been counted towards a completed award.

3 Time Requirements

(1) Except with the permission of the Faculty Board, a candidate shall complete the course within nine years of study.

(2) A candidate granted credit shall be deemed to have commenced the course from a date determined by the Dean at the time at which credit is granted.

APPROVED SUBJECTS

The subjects approved by the Faculty Board for the award are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>Prerequisite</th>
<th>Corequisite</th>
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<tbody>
<tr>
<td>100 Level Prescribed</td>
<td></td>
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<tr>
<td>BIOL101</td>
<td>Plant &amp; Animal Biology</td>
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<tr>
<td>BIOL102</td>
<td>Cell Biology, Genetics &amp; Evolution</td>
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<tr>
<td>CHEM101</td>
<td>Chemistry 101</td>
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<td></td>
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<td>CHEM102</td>
<td>Chemistry 102</td>
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<tr>
<td>GEOG101</td>
<td>Introduction to Physical Geography</td>
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<td></td>
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<tr>
<td>GEOL101</td>
<td>The Environment</td>
<td>10</td>
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<tr>
<td>SCEN101</td>
<td>Environmental Investigations I</td>
<td>10</td>
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<tr>
<td>STAT101</td>
<td>Introductory Statistics</td>
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or

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>Prerequisite</th>
<th>Corequisite</th>
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<tbody>
<tr>
<td>GEOL102</td>
<td>Earth Materials</td>
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200 Level Prescribed

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<tbody>
<tr>
<td>SCEN201</td>
<td>Environmental Investigations II</td>
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<tr>
<td>SCEN202</td>
<td>Environmental Planning &amp; Pollution Control</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCEN203</td>
<td>Water Resources Management</td>
<td>10</td>
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</table>

300 Level Prescribed

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>Prerequisite</th>
<th>Corequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCEN301</td>
<td>Environmental Project</td>
<td>10</td>
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<tr>
<td>SCEN302</td>
<td>Environmental Impact Assessment Techniques</td>
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<td>SCEN202</td>
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<tr>
<td>GEOG201</td>
<td>Hydrology</td>
<td>10</td>
<td>GEOG201, GEOG203</td>
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At the 200 and 300 Level the prescribed subjects are taken from one of the three strands of Biological Sciences, Chemistry or Earth Science as follows:

Prescribed subjects for Biological Sciences strand

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>Prerequisite</th>
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<tr>
<td>BIOL207</td>
<td>Ecology</td>
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<td>CHEM261</td>
<td>Environmental Chemistry</td>
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<td>CHEM101, CHEM102</td>
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</tr>
<tr>
<td>10 cp from</td>
<td>Earth Materials</td>
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<td>GEOL101</td>
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<td>PHYS102</td>
<td>Physics 102</td>
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<tr>
<td>GEOG203</td>
<td>Biogeography &amp; Climatology</td>
<td>10</td>
<td>GEOG101</td>
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<tr>
<td>GEOG204</td>
<td>Geomorphology of Australia</td>
<td>10</td>
<td>GEOG101</td>
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<td>20 cp from</td>
<td>Biochemistry</td>
<td></td>
<td>BIOL101, BIOL102</td>
<td></td>
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<tr>
<td>BIOL201</td>
<td>Animal Physiology</td>
<td>10</td>
<td>BIOL101, BIOL102</td>
<td></td>
</tr>
<tr>
<td>BIOL202</td>
<td>Plant Physiology</td>
<td>10</td>
<td>BIOL101, BIOL102</td>
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</table>

300 Level

<table>
<thead>
<tr>
<th>Code</th>
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**Prescribed subjects for Earth Science strand**

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### Footnotes

The normal pattern for the Bachelor of Environmental Science degree is 80 credit points at 100 level, 80 credit points at 200 level and 80 credit points at 300 level.

Leaves of absence — For the purposes of Rule 10 of the Rules Governing Academic Awards, a candidate shall be deemed to be in good standing if, at the conclusion of the year of last enrolment in the course, that candidate was eligible to re-enrol without restrictions.

Advisory entry requirement: HSC 3 unit Mathematics with a mark of at least 110/150 and 2 unit Physics or 4 unit Science with a performance in the top 50% of candidature for these subjects.
Qualification for the Degree

2. To qualify for admission to the degree, candidates shall pass subjects totalling 240 credit points selected from the list of Approved Subjects and comprising:
   - at least 60 credit points from 100 level subjects;
   - at least 60 credit points from 200 level subjects;
   - at least 80 credit points from 300 level subjects.

(2) Credit may be granted for studies completed which are recognised as such by the Faculty Board.

Credit

3. Credit may be granted for all subjects completed in the following conditions:
   - the 60 credit points at the 100 level shall be comprised of at least 20 credit points chosen from each of three disciplines;
   - a sequence of at least 20 credit points at the 100 level, 30 credit points at the 200 level and 40 credit points at the 300 level shall be chosen from a single discipline;
   - not more than 160 credit points may be chosen from a single discipline; and
   - subjects at the 300 level may not be chosen from more than three disciplines.

Time Requirements

4. Except with the permission of the Faculty Board, a candidate shall complete the course within nine years of study.

Combined Degrees

5. A candidate may undertake one of the following combined degree programs in accordance with Rule 12 of the Rules Governing Academic Awards, namely:
   - Science/Arts
   - Science/Computer Science
   - Science/Mathematics
   - Science/Engineering.

Approved Subjects

The subjects approved by the Faculty Board for the award are in the discipline areas of Biological Sciences, Chemistry, Geography, Geology, Mathematics, Physics and Psychology and are listed in Group A Subjects.

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CHEMISTRY

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### UNDERGRADUATE DEGREE AND DIPLOMA RULES

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SECTION THREE

SCHEDULE — BACHELOR OF SCIENCE (AVIATION)

1 Qualification for the Degree

(1) To qualify for admission to the degree, candidates shall pass subjects totalling 240 credit points selected from the list of Approved Subjects and comprising:

(a) at least 60 credit points from 100 level Group A subjects;
(b) at least 60 credit points from 200 level subjects of which 50 credit points shall be from Group A; and
(c) at least 80 credit points from 300 level subjects of which 40 credit points shall be from Group A.

2 Credit

(1) Credit may be granted for studies completed which qualified the candidate for an award of the University or for studies completed at another institution up to a total of 120 credit points.

(2) Credit may be granted for all subjects completed in the University which have not already been counted towards a completed award.

3 Time Requirements

(1) Except with the permission of the Faculty Board, a candidate shall complete the course within nine years of study.

(2) A candidate granted credit shall be deemed to have commenced the course from a date determined by the Dean at the time at which credit is granted.

APPROVED SUBJECTS

The subjects approved* by the Faculty Board for the award are:

GROUP A SUBJECTS

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<tr>
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<td>Introductory Aerodynamics</td>
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<td>AVIA113</td>
<td>Aircraft Performance &amp; Systems</td>
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<td>AVIA114</td>
<td>Flight Rules &amp; Procedures</td>
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<td>AVIA115</td>
<td>Reciprocating Engines</td>
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<td>AVIA116</td>
<td>Commercial Meteorology</td>
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<td>Jet Engines</td>
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<td>AVIA212</td>
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<td>Aviation Computing and Electronics</td>
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GROUP B SUBJECTS

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<td>Human Factors</td>
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<td>AVIA220</td>
<td>Aircraft Fatigue Management</td>
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<td>Human Performance in Multi-Crew Operations</td>
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SECTION THREE

UNDERGRADUATE DEGREE AND DIPLOMA RULES

SCHEDULE — BACHELOR OF MATHEMATICS

1 Qualification for the Degree

(1) To qualify for admission to the degree a candidate shall pass subjects totalling 240 credit points from the list of Approved Subjects and comprising:

(a) not more than 80 credit points from 100 level subjects of which 20 credit points shall be from Group A;

(b) at least 70 credit points from 200 level subjects of which:

(i) at least 25 credit points shall be from Group A;

(ii) at least 5 credit points shall be from Group B subjects; and

(iii) at least a further 30 credit points shall be from Group B and/or Group C;

(c) at least 80 credit points from 300 level subjects of which:

(i) at least 40 credit points shall be from Group A; and

(ii) at least a further 40 credit points shall be from Group A and/or Group C.

2 Credit

(1) Credit may be granted for studies completed which qualified the candidate for an award of the University or for studies completed at another institution up to a total of 120 credit points including not more than:

(a) 100 credit points at the 100 level;

(b) 40 credit points at the 200 level; and

(c) 20 credit points at the 300 level.

(2) Credit may be granted for all subjects completed in the University which have not already been counted toward a completed award.

3 Time Requirements

(1) Except with the permission of the Faculty Board, a candidate shall complete the course within nine years of study, from its commencement.

(2) A candidate who has been granted credit shall be deemed to have commenced the course from a date determined by the Dean at the time at which credit is granted.

4 Combined Degrees

A candidate may undertake one of the following combined degree programs in accordance with Rule 12 of the Rules Governing Academic awards, namely:

Mathematics/Arts;

Mathematics/Commerce;

Mathematics/Engineering;

Mathematics/Economics;

Mathematics/Computer Science;

Mathematics/Surveying;

Mathematics/Science.
# Approved Subjects

The subjects approved* by the Faculty Board for the award are:

## Group A Subjects

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## Group B Subjects

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## Physics

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<td>Scientific Measurement Principles, Processes and Applications</td>
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SECTION THREE

UNDERGRADUATE DEGREE AND DIPLOMA RULES

SCHEDULE — BACHELOR OF SCIENCE

(Psychology)

1 Interpretation

In this schedule, "discipline" means a branch of learning recognized as such by the Faculty Board.

2 Qualification for the Degree

(1) To qualify for admission to the degree, a candidate shall pass subjects totaling 320 credit points from the list of Approved Subjects and comprising:

(a) at least 60 credit points from 100 level subjects of which:

(i) 20 credit points shall be from Group A subjects; and

(ii) 40 credit points shall be comprised of 20 credit points each of two disciplines;

(b) at least 60 credit points from 200 level subjects of which 40 credit points shall be from Group A subjects;

(c) at least 80 credit points from 300 level subjects of which 60 credit points shall be from Group A subjects; and

(d) 80 credit points from 400 level subjects taken from Group A subjects.

3 Grading of the Degree

(1) The degree shall be conferred as an ordinary degree except that, where the performance of a candidate has reached a standard determined by the Faculty Board to be of sufficient merit, the degree shall be conferred with Honours.

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

4 Credit

(1) Credit may be granted for studies completed which qualified the candidate for an award of the University or for studies completed at another institution up to a total of 120 credit points including not more than:

(a) 100 credit points at the 100 level;

(b) 40 credit points at the 200 level; and

(c) 20 credit points at the 300 level.

(2) Credit may be granted for all subjects completed in the University which have not already been counted towards a completed award.

5 Time Requirements

(1) Except with the permission of the Faculty Board, a candidate shall complete the course within eleven years, from its commencement.

(2) A candidate who has been granted credit shall be deemed to have commenced the course from a date determined by the Dean at the time at which credit is granted.

Footnotes

The normal pattern for the Bachelor of Mathematics Degree is 80 credit points at 100 level, 80 credit points at 200 level, and 80 credit points at 300 level.

Leave of Absence — For the purposes of Rule 10 of the Rules Governing Academic Awards, a candidate shall be deemed to be in good standing if, at the conclusion of the year of leave it enrolment in the course, that candidate was eligible to re-enrol without restrictions.

* Credit cannot be obtained for both MATH112 and MATH102.

* Entry requirement HSC 3 unit Mathematics with a mark of at least 120/150.

* This option is for students who take MATH101 in second semester.

* Students who have passed Mathematics I in 1989 or before do not need MATH204.

* Advisory entry requirement: HSC 2 unit Mathematics with performance in the top 30% of candidates.

* Advisory entry requirements: HSC 3 unit Mathematics with a mark of at least 110/150 and 2 Unit Physics or 4 Unit Science with a performance in the top 50% of candidates for these subjects.

* Students achieving a Credit level or better in PHYS101 and PHYS102 may be admitted with approval of the Head of Department.

* Credit cannot be obtained for both STAT201 and STAT205.

* Footnotes may be chosen from the schedules for the degrees offered elsewhere in the University, if approved by the Dean.
The subjects approved by the Faculty Board for the award consist of the following prescribed Group A and Group B subjects:

**GROUP A SUBJECTS**

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<td>PSYC201</td>
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<td>Developmental &amp; Social Processes</td>
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<td>PSYC206</td>
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**GROUP B SUBJECTS**

Group B Subjects are in the following discipline areas: Biological Sciences, Chemistry, Geography, Geology, Mathematics and Physics; they are referred to in the Bachelor of Science Schedule of Approved Group A Subjects (excepting the discipline of Psychology).

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**SCHEDULE — DIPLOMA IN AVIATION SCIENCE**

1 **Qualification for the Diploma**

   (1) To qualify for admission to the diploma a candidate shall pass subjects totalling 160 credit points from the list of Approved Subjects comprising:

   (a) at least 60 credit points from 100 level Group A subjects; and

   (b) at least 60 credit points from 200 level subjects including at least 50 credit points from Group A subjects.

2 **Grading**

   In cases where a candidate's performance in the course has reached a level determined by the Faculty Board, on the recommendation of the Board of Studies in Aviation, the Diploma may be conferred with Merit.

3 **Time Requirements**

   (1) Except with the permission of the Faculty Board, a candidate shall complete the course within six years of study.

   (2) A candidate who has been granted credit shall be deemed to have commenced the course from a date determined by the Dean at the time at which credit is granted.
SECTION THREE
UNDERGRADUATE DEGREE AND DIPLOMA RULES

APPROVED SUBJECTS
The subjects approved* by the Faculty Board for the award are:

GROUP A SUBJECTS

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<tr>
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GROUP B SUBJECTS

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Footnotes
The normal pattern for the Diploma in Aviation Science course is 80 credit points at 100 level and 80 credit points at 200 level.
Leave of Absence — For the purposes of Rule 10 of the Rules Governing Academic Awards, a candidate shall be deemed to be in good standing if, at the conclusion of the year of last enrolment in the course, that candidate was eligible to re-enrol without restrictions.
* Refers to the list of approved subjects in the Schedule — Bachelor of Science Group A Subjects.

SECTION FOUR

APPROVED SUBJECTS FOR THE BACHELOR DEGREES

List of Approved Subjects Referred to in Bachelor Degree Schedules
F = Full Year; S1 = Semester 1; S2 = Semester 2

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### ENVIRONMENTAL SCIENCE SUBJECTS

Consult other Departmental lists for other prescribed subjects required. See Award Rules

**Available only to Bachelor of Environmental Science Degree candidates**

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### DIVISION OF QUANTITATIVE METHODS

**MAQM214 Quantitative Methods**

- Number: 10
- Points: S2
- When: 4
- H/W: STAT101 & INFO101

### Footnotes

1. Entry requirement — HSC 3 unit Mathematics with a mark of at least 120/150
2. Students who have passed Mathematics I in 1989 or before do not need MATH204
3. Credit cannot be obtained for both MATH212 and MATH102
4. Credit cannot be obtained for both MATH217 and MATH218.

### PHYSICS

- PHYS101 Physics 101
- PHYS102 Physics 102
- PHYS103 Physics 103

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The numbers and points are consistent with the expected format for a course catalog. The table provides a structured view of the approved subjects, including their numbers, titles, points, when they are offered, whether homework is required, and prerequisites and corequisites. Footnotes provide additional information to clarify certain requirements and restrictions.
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<td>6</td>
<td>PHYS201</td>
<td></td>
</tr>
</tbody>
</table>

**Footnotes**

6. Advisory entry requirement - HSC 2 unit Mathematics with a performance in the top 30% of candidates.

7. Assumed knowledge of HSC2 unit Physics or 4 unit Science (with a result in the top 50% of the candidate) and HSC3 unit Mathematics (with a mark of at least 110/150). Students with lesser attainment than this are advised to attempt Physics 101, together with a first year mathematics subject before proceeding to Physics 102.

8. Students achieving a credit level or better in PHYS101 and PHYS102 may be admitted with approval of the Head of Department. MATH111 and MATH112 may substitute for MAT103 with approval of Head of Department.

### PSYCHOLOGY

<table>
<thead>
<tr>
<th>Number</th>
<th>Subject</th>
<th>Points</th>
<th>When</th>
<th>H/W</th>
<th>Prerequisites</th>
<th>Corequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC101</td>
<td>Psychology Introduction 1</td>
<td>10</td>
<td>S1</td>
<td>5</td>
<td>—</td>
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</tr>
<tr>
<td>PSYC102</td>
<td>Psychology Introduction 2</td>
<td>10</td>
<td>S2</td>
<td>5</td>
<td>PSYC101</td>
<td>—</td>
</tr>
<tr>
<td>PSYC201</td>
<td>Foundations for Psychology</td>
<td>10</td>
<td>S1</td>
<td>4</td>
<td>PSYC101</td>
<td>PSYC201</td>
</tr>
<tr>
<td>PSYC202</td>
<td>Basic Processes</td>
<td>10</td>
<td>S1</td>
<td>4</td>
<td>PSYC102</td>
<td>PSYC201</td>
</tr>
<tr>
<td>PSYC203</td>
<td>Developmental &amp; Social Processes</td>
<td>10</td>
<td>S2</td>
<td>4</td>
<td>PSYC102</td>
<td>PSYC201</td>
</tr>
<tr>
<td>PSYC204</td>
<td>Individual Processes</td>
<td>10</td>
<td>S2</td>
<td>4</td>
<td>PSYC102</td>
<td>PSYC201</td>
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<tr>
<td>PSYC205</td>
<td>Applied Topics in Psychology 1</td>
<td>10</td>
<td>Not</td>
<td>4</td>
<td>PSYC102</td>
<td>PSYC201</td>
</tr>
<tr>
<td>PSYC206</td>
<td>Applied Topics in Psychology 2</td>
<td>10</td>
<td>Not</td>
<td>4</td>
<td>PSYC102</td>
<td>PSYC201</td>
</tr>
<tr>
<td>PSYC301</td>
<td>Advanced Foundations for Psychology</td>
<td>10</td>
<td>S1</td>
<td>4</td>
<td>PSYC201,PSYC202</td>
<td>PSYC201</td>
</tr>
<tr>
<td>PSYC302</td>
<td>Independent Project</td>
<td>10</td>
<td>F</td>
<td>2</td>
<td>PSYC201</td>
<td>PSYC201</td>
</tr>
<tr>
<td>PSYC303</td>
<td>Basic Processes 1</td>
<td>10</td>
<td>S1</td>
<td>4</td>
<td>PSYC201</td>
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</table>
### Approved Subjects

#### SECTION FOUR

<table>
<thead>
<tr>
<th>Number</th>
<th>Subject</th>
<th>Points</th>
<th>When</th>
<th>H/W</th>
<th>Prerequisites 1993</th>
<th>Corequisites 1993</th>
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<tbody>
<tr>
<td>COMP305</td>
<td>Algorithm Design and Analysis</td>
<td>10</td>
<td>1</td>
<td></td>
<td>COMP201</td>
<td></td>
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<tr>
<td>COMP306</td>
<td>Computer Graphics</td>
<td>10</td>
<td>2</td>
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<td>COMP201</td>
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<tr>
<td>COMP307</td>
<td>Software Engineering Principles</td>
<td>10</td>
<td>F**</td>
<td></td>
<td>COMP201 or Graduate enrolment</td>
<td></td>
</tr>
<tr>
<td>COMP308</td>
<td>Operating Systems</td>
<td>10</td>
<td>2</td>
<td></td>
<td>COMP201</td>
<td>COMP202</td>
</tr>
<tr>
<td>COMP391</td>
<td>Special Topic 1</td>
<td>10</td>
<td>Not in Yr II of BCompSc</td>
<td></td>
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</tbody>
</table>

** Elective subjects. Not all elective subjects will be available in any one year. Elective subjects indicated as potentially available may be cancelled if enrolments are insufficient. Availability should be confirmed with the Department Office.

** COMP307 requires attendance at lectures in Semester 1 and completion of a project report in Semester 2.

#### INFORMATION SCIENCE

<table>
<thead>
<tr>
<th>Number</th>
<th>Subject</th>
<th>Points</th>
<th>When</th>
<th>H/W</th>
<th>Prerequisites</th>
<th>Corequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO101</td>
<td>Introduction to Information Systems</td>
<td>10</td>
<td>S1, S2</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### LAW

** Compulsory Subjects

The following subjects are compulsory for candidates enrolled in the combined Bachelor of Science/Bachelor of Laws degree: consult the Faculty of Law Handbook for further details.

| LL.B.101 | Legal Progress | 20 |
| LL.B.102 | Criminal Law and Procedure | 20 |
| LL.B.201 | Torts | 20 |
| LL.B.202 | Property I | 10 |
| LL.B.301 | Contracts | 20 |
| LL.B.401 | Constitutional Law I | 10 |
| LL.B.402 | Administrative Law I | 10 |
| LL.B.403 | Equity and Trusts | 10 |
| LL.B.404 | Civil Procedure | 10 |
| LL.B.405 | Evidence | 10 |
| LL.B.406 | Company Law I | 10 |
| LL.B.407 | Jurisprudence | 10 |
| LL.B.408 | Professional Conduct | 10 |

#### PHILOSOPHY

| PHIL.207 | Scientific Knowledge and Scientific Method | 10 | S1 | 4 | | |

#### STATISTICS

<table>
<thead>
<tr>
<th>Number</th>
<th>Subject</th>
<th>Points</th>
<th>When</th>
<th>H/W</th>
<th>Prerequisites</th>
<th>Corequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT101</td>
<td>Introductory Statistics</td>
<td>10</td>
<td>S1, S2</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAT103</td>
<td>Introductory Mathematical Statistics</td>
<td>10</td>
<td>S2</td>
<td>5</td>
<td>Advisory MATH102 and INFO101</td>
<td></td>
</tr>
</tbody>
</table>

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** Footnote

- Credit cannot be obtained for both STAT201 and STAT205
- Credit cannot be obtained for both STAT101 and STAT103
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. **Guide to Undergraduate**
   - Prerequisites are subjects which must be passed at a Pass level or better before a candidate enrolls in a particular subject.
   - Corequisites refer to subjects or topics which the candidate must either pass before enrolling in the particular subject or be taken concurrently.

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

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

4. **Textbooks** are books recommended for purchase.

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

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**Applied Science and Technology**

**BACHELOR OF APPLIED SCIENCE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT**

EAMS/AMC subjects are available only to candidates enrolled in the Bachelor of Applied Science Environmental Assessment and Management degree.

**EAMS101 CONCEPTS OF ECOLOGY 10cp**

- **Hours:** 4 Hours per week for one semester.
- **Examination:** Written reports and end of semester examination.
- **Content:** The fundamental concepts of ecology are examined in relation to various natural systems, including dry forests, rainforests, heathlands, lakes, and wetlands. The ecosystem processes of energy flow, nutrient and water cycling, population dynamics, and competitive exclusion are studied through relevant field and laboratory investigations.
- **References:**

**EAMS102 MONITORING AND STATISTICS II 10cp**

- **Hours:** 5 Hours per week for one semester.
- **Examination:** Final examination.
- **Content:** Cell theory, diversity, Whittakers scheme of classification, microbiology of aquatic and terrestrial ecosystems sampling methods. Bright field, dark field, phase contrast, polarising microscopy and the use of the optical microscope in environmental analysis. Relevant introductory environmental chemistry. There is emphasis on group work and problem solving. The statistics program runs parallel to the above and reviews basic mathematical analysis, probability, multinomial, binomial theories and patterns of distribution.
- **Texts:**
- **References:**

**EAMS111 SYSTEMS APPROACH IN ECOLOGY 10cp**

- **Prerequisite:** EAMS101.
- **Hours:** 4 Hours per week for one semester.
- **Examination:** Written reports and end of semester examination.

---

**SECTION FIVE**

**APPLIED SCIENCE AND TECHNOLOGY SUBJECT DESCRIPTIONS**

**Content**


**Text**


**References**


**EAMS103 CONTEMPORARY ENVIRONMENTAL PHILOSOPHY 10cp**

- **Hours:** 2 Hours per week for one semester.
- **Examination:** Tutorial work and assessment, essay, take-home examination.

**Content**

The historical foundations of despotic and destructive attitudes toward the natural environment, contemporary responses to the need for an environmental ethic, eg, Stewardship, Animal Rights - Liberation, the Land Rights, Deep Ecology, Eco-feminism, Social Ecology and Eco-anarchism, Gaia and other "New Age" environmental philosophies.

**References**

An extensive list of references will be provided at the commencement of lectures.

**EAMS113 ENVIRONMENT AND HUMAN VALUES I 10cp**

- **Prerequisite:** EAMS103.
- **Hours:** 2 Hours per week for one semester.
- **Examination:** Tutorial assessment, essay, take-home examination.

**Content**

A. An examination of the major responses from economics to "green" philosophies and science. Responses include: Green Capitalism, Eco-Socialism, Buddhist Economics, Negative Growth Economics, Steady-State Economics and Ecologically Sustainable Development (ESD).

B. The values that underpin scientific and technological knowledge and achievements. The Philosophy of Science, the social shaping of Science and Technology, Technology and Development.

**References**

An extensive list of references will be provided at the commencement of lectures.

**EAMS104 ENVIRONMENTAL PLANNING AND POLLUTION CONTROL LEGISLATION 10cp**

- **Hours:** 4 Hours per week lectures, field work and directed reading.
- **Examination:** Progressive assessment plus final examination.
SECTION FIVE
APPLIED SCIENCE AND TECHNOLOGY SUBJECT DESCRIPTIONS

Content
This course examines the environmental planning and development control system in NSW and pollution control legislation. The emphasis in the course is to understand the system which regulates development and requires environmental studies to be undertaken.

Text

Reference

EAMS114 LOCAL AND REGIONAL ENVIRONMENTAL ISSUES
10cp
Hours 4 Hours per week lectures, field work and directed reading.

Examination
Progressive assessment plus final examination.

Content
Case studies of particular local and regional environmental issues including the environmental impact of mining, solid waste disposal, water quality management, industrial development and sewage treatment. Introduction to environmental assessment techniques and analysis of reasons for conflict. Particular attention is given to skills in communication.

References

EAMS201 AGRICULTURAL SYSTEMS
10cp
Prerequisite EAMS101, EAMS111.

Hours 4 Hours per week for one semester.

Examination
Assignments and final examination.

Content
The effect of human disturbance of natural ecosystems is studied using agriculture as the focus. Systems concepts are further developed using a series of agricultural systems of increasing complexity and energy demand.

Text

References

EAMS211 INDUSTRIAL AND URBAN SYSTEMS
10cp
Prerequisite EAMS101, EAMS111.

Corequisite EAMS201.

Hours 4 Hours per week for one semester.

Examination Assignments and final examination.

Content
Industrial and urban systems are the focus for further studies of the impact of humans on the natural environment. The notion of Human Activity Systems is developed as an approach to the improvement of complex, environmental issues.

Text

References

EAMS202 SYSTEMS DYNAMICS AND DATA ANALYSIS I
10cp
Prerequisite EAMS102, EAMS112.

Hours 5 Hours per week for one semester.

Examination
Progressive assessment and final examination.

Content
This module develops system dynamics theory using Forrester's system dynamics language as applied to natural and man made systems. It relates positive and negative feedback control loops, rates, levels, auxiliaries, sources, sinks, information feedback and system boundaries. Models are developed taking account of perspective, reference models, time horizons and policy choices. Emphasis is placed upon the importance of group work and action research. Models of a chosen catchment are developed as part of an ongoing catchment management study.

The data analysis program runs parallel. It reviews and further develops of system insight using the minitab software program.

References

EAMS212 SYSTEM DYNAMICS AND DATA ANALYSIS II
10cp
Prerequisite EAMS102, EAMS112.

Corequisite EAMS202.

Hours 5 Hours per week for one semester.

Examination
Progressive assessment and final examination.

Content
Further development of system dynamics models. Introduction to computer modelling, rate and level equations. Dynamic language.

Data Analysis runs parallel and involves computer applications of group developed models and their analysis.

Reference

EAMC203 ENVIRONMENT AND HUMAN VALUES II
10cp
Prerequisite EAMC103, EAMC113.

Hours 2 Hours per week for one semester.

Examination
Tutorial assessment, essay, take-home examination.

Content
Public policy and environmental issues; eg energy policy, ecologically sustainable development, ethics and a sustainable society, ethics and acceptable risk, ideology and green political thought in the national and international contexts.

References

EAMS290 HYDROLOGY AND SOILS ANALYSIS
10cp
Prerequisites EAMS102, EAMS112.

Hours 4 Hours per week lectures and practicals, field work and directed reading.

Examination
Progressive assessment plus final examination.

Content
Basic components of the hydrologic cycle and soil classification and identification. Topics include rainfall/runoff analysis (RATIONAL method), soil moisture and permeability, interception, flood analysis, solute mixing, pollutant loading, instrumentation and small catchment hydrology.

References

EAMS291 WATER RESOURCES MANAGEMENT
10cp
Prerequisites EAMS102, EAMS112.

Corequisite EAMS290.

Hours 4 Hours per week lectures and practicals, field work and directed reading.

Examination
Progressive assessment plus final examination.

Content
Examination of many of the major environmental issues associated with water resources development. Topics covered include reservoir and catchment management, water use, entrophication, thermal stratification of storages, floodplain management, irrigation/irrigation and wastewater disposal to land and water bodies.

References

EAMS292 PLANT SYSTEMATICS AND PLANT ECOLOGY
10cp
Prerequisites EAMS101, EAMS111.

Hours 4 Hours per week for one semester.

Examination
Assignments, laboratory and field reports, and final examination.

Content
A study of the botanical concepts and principles with particular emphasis upon Australian species and ecosystems. Students will acquire skills in plant identification and classification, physiological processes and evolutionary adaptations will be studied along with checklists, distributions, and plant associations reflecting environmental factors. Current theories in plant ecology will be examined.

Text To be advised.

Reference

EAMS293 ANIMAL SYSTEMATICS AND ANIMAL ECOLOGY
10cp
Prerequisites EAMS101, EAMS111.

Corequisite EAMS292.

Hours 4 Hours per week for one semester.

Examination
Assignments, laboratory and field reports and final examination.

Reference
Addison Wesley.
EAMS301 ENVIRONMENTAL MANAGEMENT I 10 cp
Prerequisites: EAMS201, EAMS211.
Hours: 4 Hours per week for one semester.
Examination: Assignments, field reports and final examination.

Content:
The student is assigned to a co-operating host organisation and placed in a position to solve a real situation to study an issue or set of issues currently being addressed by that organisation. The student will report on the structure and functions of the host organisation and on progress made towards the resolution of the particular issue(s) under study.

References:

EAMS302 SPECIALIST STUDY 20 cp
Prerequisite: All prescribed Level 200 subjects.
Hours: 4 Hours per week (minimum) for one year.
Examination: Maintenance of log book, performance at viva, and submission of final report.

Content:
The student is assigned to a co-operating host organisation and placed in a position to solve a real situation to study an issue or set of issues currently being addressed by that organisation. The student will report on the structure and functions of the host organisation and on progress made towards the resolution of the particular issue(s) under study.

References:

EAMS303 REGIONAL AND NATIONAL ENVIRONMENTAL ISSUES 10 cp
Prerequisites: EAMS104, EAMS114.
Hours: 4 Hours per week, field work and directed reading.
Examination: Progressive assessment plus final examination.

Content:
This course examines case studies of regional and national environmental issues which highlight the major types of environmental assessment. The Commonwealth environmental legislation and environmental law are also covered.

References:

EAMS304 ENVIRONMENTAL IMPACT ASSESSMENT 10 cp
Prerequisites: EAMS104, EAMS114.
Hours: 4 Hours per week, field work and directed reading.
Examination: Progressive assessment plus final examination.

Content:
This course covers the rationale and methodology of environmental impact assessment (EIA). Also covered are impact assessment techniques in the practice, the role of International Aid agencies, current developments in environmental management, environmental audits and risk analysis.

Texts:
Reference:

EAMS309 SOIL CONSERVATION AND MANAGEMENT 10 cp
Prerequisites: EAMS290, EAMS291.
Hours: 4 Hours per week lectures and practicals, field work and directed reading.
Examination: Progressive assessment plus final examination.

Content:
Examination of soils, land use and conservation, particularly in relation to soils of NSW. Soil and water management principles for various types of land use including urban development. Practical analysis of control structures, sizing and prediction. Use of soils for domestic and industrial wastewater disposal and site rehabilitation.

Text:
Charman, P. E.V. and Murphy, B. W. 1991, Soils Their Properties and Management Sydney University Press.

EAMS310 WATER AND SOILS APPLICATIONS AND MODELLING 10 cp
Prerequisites: EAMS290, EAMS291.
Corequisite: EAMS390.
Hours: 4 Hours per week lectures and practicals, field work and directed readings.
Examination: Progressive assessment plus final examination.

Content:
The course covers the user and application of micro-computers to model water balances, runoff, stormwater quality, non-point source pollution and soil erosion. Specific examination of practical applications using POLLUTE, SOILLOSS (USLE), ANSWERS, CREAMS, GMT and other software models to simulate hydrologic processes and water quality and pollutant variables.

References:

EAMS311 ENVIRONMENTAL MANAGEMENT II 10 cp
Prerequisites: EAMS201, EAMS211.
Corequisite: EAMS301.
Hours: 4 Hours per week for one semester.
Examination: Assignments, field reports and final examination.

Content:
The principles of land management and people management will be explored in relation to the impact of developments in Australia. Restoration and rehabilitation techniques and practices will be studied in conjunction with cost/benefit analysis and the maintenance of biological diversity, freshwater, soil and marine resources.

Texts:

EAMS312 ENVIRONMENTAL IMPACT ASSESSMENT 10 cp
Prerequisites: EAMS104, EAMS114.
Hours: 4 Hours per week, field work and directed reading.
Examination: Progressive assessment plus final examination.

Content:
This course covers the rationale and methodology of environmental impact assessment (EIA). Also covered are impact assessment techniques in the practice, the role of International Aid agencies, current developments in environmental management, environmental audits and risk analysis.

Texts:
Reference:
Airline Subject Descriptions

AVIA subjects are available only to candidates enrolled in the Bachelor of Science (Aviation) degree

100 Level Aviation Syllabus

The syllabus is based upon four broad areas of study:
1 Aeronautical Engineering (aerodynamics, engines, systems and design);
2 Aviation Science (meteorology and navigation);
3 Human Factors (aviation psychology, medicine, and ergonomics);
4 Aviation Management (aviation law, administration, and computer applications).

The syllabus has a spiral design with a broad foundation in first year progressing to in-depth and more individualised study in the third year. The project in third year is designed as a background to pursue a postgraduate Bachelor of Science (Aviation) Honours program. Group or individual projects are problem-based and require students to gain industry experience in link theory and practice.

The sequence and scheduling of aviation subjects is determined by the needs of integration with flight training and commercial pilot licensing over the first two years of the degree.

AVIA109 INTRODUCTORY METEOROLOGY 5cp

Hours 3 Hours per week for one semester.

Examination Progressive assessment based on assignments and tutorials plus a 2 hour final examination.

Content

Introduction to atmospheric pressure, wind, humidity, thermodynamics, cloud, precipitation and icing; Structure of the atmosphere; Introduction to aviation forecasts and meteorological reports.

Text

P.H. Meteorology


AVIA110 INTRODUCTORY NAVIGATION 5cp

Hours 3 Hours per week for one semester.

Examination Progressive assessment based on assignments and tutorials plus a 2 hour final examination.

Content

Practical methods of pilot navigation flight planning. The theoretical aspects of navigation; the form of the earth; map projections, scale and scale variation, conformality; navigational astronomy, the vector triangle and its solution by plotting and by computing; flight and navigational instruments, theoretical aspects, accuracy, errors and use.

Text

Aeronautical Information Publication (CAA).

AVIA111 INTRODUCTORY AERODYNAMICS 5cp

Hours 3 Hours per week for one semester.

Examination Progressive assessment plus a final examination.

Content

Basic fluid mechanics of an incompressible flow, Reynolds's No., Bernoulli's equation. The generation of lift, drag, induced drag, lift augmentation devices, downwash and wake turbulence. Properties of aerofoils, three dimensional effects on section characteristics. Aerodynamic factors influencing aircraft performance drag index, L/D ratio, configuration and altitude effects, climb and descent.

References


Thom, T. Basic Aeronautical Navigation Theory Centre.

AVIA112 INTRODUCTORY HUMAN FACTORS 10cp

Hours 4 Hours per week for one semester.

Examination Progressive assessment based on class tests, seminars, assignments and a 2 hour examination.

Content

Information processing; vision/balance; spatial disorientation; perception; memory; decision making; motor control.

Text


Reference


AVIA113 AIRCRAFT PERFORMANCE AND SYSTEMS 5cp

Hours 3 Hours lecture and 2 Hours tutorial a week for one semester.

Examination Progressive assessment plus a final examination.

Content

(a) Principles of operation of aircraft fuel, hydraulic and electrical systems, undercarriage and flight controls. The application of mechanical linkages, and electrical circuits to these systems. Basic circuit theory.

(b) Aircraft weight and balance, performance and structural weight limitations, determination of take-off and landing weight and centre of gravity, aerodynamics reasons of centre of gravity limitations, use of aircraft loading systems (mathematical and graphical approaches), adjustment of weight and centre of gravity, regulatory requirements.

(c) International Standard Atmosphere, factors affecting aircraft performance, use of performance charts for take-off and landing, limitations and safety considerations, regulations and requirements for Authorised Landing Areas.

Text

T. Basic Aeronautical Navigation Theory Centre.
AVIA117 NAVIGATION 5cp
Prerequisite AVIA110.
Hours 3 Hours per week for one semester.
Examination Progressive assessment based on assignments, tutorials and examinations and a 2 hour final examination.

Content
Theoretical aspects of Rhumb line navigation. The development of metal DR and of orientation systems. Pilot navigation techniques from air plot and track plot methods.

Aviation Weather
The development of metar and aviation forecasts. Marine DR and of orientation systems. Pilot navigation radio aids. Their basic principles, signal propagation, use, errors.

Examination
Flight planning for twin piston engined aircraft. The point of no return and critical point.

Text
Aeronautical Information Publication (CAA).

AVIA118 AERODYNAMICS 5cp
Prerequisite AVIA111.
Hours 3 Hours per week for one semester.
Examination Progressive assessment based on laboratory reports and assignments plus a final examination.

Content

References

AVIA119 AVIATION PSYCHOLOGY AND MEDICINE 5cp
Prerequisite AVIA112.
Hours 3 Hours per week for one semester.
Examination Progressive assessment based on class tests, assignments, tutorials and a 2 hour final examination.

Content
Medicine altitude, atmosphere and respiration; acceleration, vision, hearing, air sickness; health, drugs, first aid, pilot fitness; fatigue; Psychology attention, workload, stress, personality, communications.

Tests
O'Hare, D. and Roscoe, S. 1990, Flighthead Performance—The Human Factor, Iowa U.P.

References

AVIA120 AVIATION LAW, COMMERCIAL FLIGHT RULES & PROCEDURES 10cp
Prerequisite AVIA114.
Hours 4 Hours per week for one semester.
Examination Progressive assessment based on assignments and tutorials plus a 2 hour final examination on Part A and a 3 hour final examination on Part B.

Content
Part A The origins of Law in Australia; Legal Institutions in Australia; Constitution; Tort (Negligence); Criminal Law; Contract (Hire & Insurance); Criminal Law; Disenfranchisement of the Aviation Industry; International Conventions; Administrative Law; Part B Australian Civil Aviation Regulations and Orders governing aircraft licensing and procedures to the level of Commercial Pilot Licence.

Texts
Civil Aviation Regulations (CAA).
Civil Aviation Orders 20-99, 100, (CAA).

AVIA121 AIRCRAFT SYSTEMS AND PROPULSION 5cp
Prerequisite AVIA111.
Hours 3 Hours per week for one semester.
Examination Assessment based on assignments and laboratory reports plus a final examination.

Content
Hydraulic and mechanical systems on aircraft, air conditioning and pressurisation including thermodynamics, ice protection and fire systems, under carriage and flight controls. Electrical systems, analog devices, basic circuit analysing Kirchoff and Thévenin methods, testing circuits, filters. Introduction to database and spreadsheet software.

References
Smith, R.J. 1987, Electronics Circuits and Devices Wire.

AVIA122 AIRCRAFT PERFORMANCE AND LOADING 5cp
Prerequisite AVIA113.
Hours 3 Hours per week for one semester.
Examination Progressive assessment plus a final examination.

Content
(a) Mean Aerodynamic Chord; advanced use of loading charts; adjustment of weight and centre of gravity.
(b) Multi-engine operations and performance considerations; use of take-off enroute; and landing performance charts for single and multi-engine aircraft, knowledge of the performance and operation of the Echo Mk IV aerofoil.

Texts
Civil Aviation Regulations (CAA).
Civil Aviation Orders 20-99, 100 (CAA).
Aeronautical Information Publication (CAA).
Abridged Performance and Operation Manual for Echo Mk IV.

AVIA127 AVIATION METEOROLOGY 5cp
Prerequisite AVIA116.
Hours 3 Hours per week for one semester.
Examination Progressive assessment plus a 2 hour final examination.

Content
Operational meteorology, tropical meteorology, complex thermodynamics, micro and meso-scale winds, surface synoptic charts, dynamics of low and highs, visibility, fog, hazardous weather analysis.

Text
Bureau of Meteorology, Manual of Meteorology Parts 1 and 2 Department of Aviation Meteorology Handbook.

AVIA208 INSTRUMENT NAVIGATION 5cp
Prerequisite AVIA116.
Hours 3 Hours per week for one semester.
Examination Progressive assessment plus a 2 hour final examination.

Content
Radio Navigation Systems and Aids; Radio Navigation techniques using conventional aids; ADF/NDB, VOR, DME, ILS, Flight Director, Radar; Principles and errors of radio and radar aids.

Texts

AVIA210 COMPRESSIBLE AERODYNAMICS 5cp
Prerequisite AVIA118.
Hours 3 Hours per week for one semester.
Examination Progressive assessment, tutorials plus a final examination.

Content
Thermodynamics of a compressible perfect gas, effects of compressibility on lift, Prandtl-Glauert equation, critical mach number, shock tunnel and drag of vengeance. Supersonic and transonic aerodynamics and wings, wave drag, area ruling. Vonotus alti at low speeds from delta wings and strakes.

References

AVIA211 JET ENGINES 5cp
Prerequisite 60 credit points AVIA100 level.
Hours 3 Hours per week for one semester plus field trip.
Examination Progressive assessment plus final examination.

Content
Characteristics of gas turbine engines and basic thermodynamic analysis, requirements for combustion, fuel specifications, combustion chambers, turbines, compressor design features, materials employed in aviation gas turbines, turbo-jets, turbo-fans, turbo-props, ramjets, requirements for supersonic intake and nozzle designs, developments in transonic, supersonic and...
### AVIA219 HIGH ALTITUDE METEOROLOGY AND FORECASTING 5cp

**Prerequisite**: AVIA207.

**Hours**: 3 Hours per week for one semester.

**Examination** Progressive assessment plus a 2 hour final examination.

**Content**

Upper air meteorology, jet streams, clear air turbulence, complex flow, thermal winds, wind shear, forecasting using radar, use of satellites, forecasting meso-scale phenomena.

**Reference**

CAG's 80 and 82, 100 - 104 series (CAA). CAA's (CAA).

### AVIA220 AIRCRAFT FATIGUE MANAGEMENT 5cp

**Prerequisite**: AVIA213.

**Hours**: 3 Hours per week for one semester.

**Examination** Progressive assessment plus final examination.

**Content**

Concepts of safe life, fall safe and damage tolerance. The mechanism of fatigue, stress concentration, dynamic load spectra, crack propagation, fatigue life determination, limitations of fatigue test methods, non-destructive inspection techniques, damage tolerance ratings, certification requirements, aircraft structural inspection programmes, managing the "aging aircraft" fleet. Static structural overload: column and sheet instabilities. Failures in composites.

**References**


1991, Structural Integrity of Aging Airplanes Springer Veria.

### AVIA221 HUMAN PERFORMANCE IN MULTI-CREW OPERATIONS 5cp

**Prerequisite**: AVIA121.

**Hours**: 3 Hours per week for one semester.

**Examination** Progressive assessment based on seminars, exercises (including demonstrated instruction), assignments and a final examination.

**Content**

Personality; communications; group processes; leadership; cabin safety.

**Text**


### AVIA222 MANAGEMENT OF AVIATION 5cp

**Prerequisite**: AVIA120.

**Hours**: 3 Hours per week for one semester.

**Examination** Progressive assessment based on seminars, projects, exercises, plus a final examination.

**Content**


**References**

Civil Aviation Orders 101, 103, 108 series


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### AVIA223 AVIATION COMPUTING AND ELECTRONICS 5cp

**Prerequisite**: AVIA212.

**Hours**: 3 Hours per week for one semester.

**Examination** Progressive assessment plus a final examination.

**Content**

Amplification and switching circuits using p-n junctions. Boolean logic, logic gates, TTL and CMOS logic devices, multiplexers, comparators, analog-digital converters, computer architecture, interfacing standards. The application of electronic circuits and computers in the control of aircraft systems; an overview of the glass cockpit. Transducers; the application of electronic circuits and computers in data acquisition and the control of servo devices.

**References**

Smith, R; 1987, Electronics Circuits and Devices ; 2nd edn, Wiley.


1987, United Airlines Avionics Fundamentals IA.

Mitchell, Introduction to Electronics Design.

### AVIA205 AIRCRAFT DESIGN 5cp

**Prerequisite**: AVIA213

**Hours**: 3 Hours per week for one semester.

**Examination** Progressive assessment based on individual and syndicate tasks plus final examination.

**Content**

Parametric design of aircraft, performance estimation, power requirements, international design standards, market feasibility studies, aircraft development case studies. The syllabus addresses the various roles the professional pilot may play in the multidisciplinary process of aircraft design and development.

**References**

Civil Aviation Orders 101, 103, 108 series


AVIA306 ADVANCED AIRCRAFT OPERATIONS 10cp
Prerequisite AVIA214.
Hours 4 Hours per week for one semester.
Examination Progressive assessment by class tests, tutorial presentations and assignments.
Content
Aircraft systems analysis and design.

AVIA311 ADVANCED AVIATION INSTRUCTION 10cp
Prerequisite AVIA308.
Hours 4 Hours of lectures and 2 Hours of tutorials a week in semester two.
Examination Progressive assessment based on seminar preparation and presentations, practical teaching, assignments and examination.
Content
Instructional design, problem-based learning, computers in instruction, simulation, training environments, student stress and training, aircrew performance assessment.

AVIA312 APPLIED AERODYNAMICS 5cp
Prerequisite AVIA318, AVIA223
Hours 3 Hours per week for one semester
Examination Progressive assessment plus final examination.

Content
a) Flight simulation using analog and digital computers, modelling stability and control characteristics from flight test data, simulator fidelity, aircraft flight control computers.
b) The use of computers in predicting aerodynamic performance; comparison of computer predictions with wind tunnel results, moulding real aircraft effects including boundary layers, and compressibility.

AVIA314 DIRECTED STUDY 10cp
Prerequisite At least two of the following: AVIA306, AVIA308, AVIA310, AVIA318
Hours 4 Hours per week in semester two.
Examination Satisfactory completion of project.

Content
This subject is designed for students interested in developing a specialist topic under the supervision of a lecturer. The approval of the lecturer and Year III co-ordinator is required. A detailed proposal indicating objective(s) and workplan are to be submitted by the end of semester one. The resultant project should represent the allocation of four Hours per week for the second semester, and is due on the first week of the examination period at the end of the semester.

Text To be advised.

AVIA315 ADVANCED AVIATION MANAGEMENT 5cp
Prerequisite AVIA222.
Hours 3 Hours per week for one semester.
Examination Progressive assessment based on seminars, assignments and final project.

Content
Students will be assigned to groups of four which will be responsible for the production of a group report on an aviation management topic to be decided in consultation.

AVIA316 FLIGHT DECK PERFORMANCE 5cp
Prerequisite AVIA221.
Hours 3 Hours per week for one semester.
Examination Progressive assessment and final exam.

Content
Systems theory in aviation; selection and testing of pilots; human factors research methods; accident investigation.

Text
Flightdeck Performance: Course Resource Materials.

AVIA317 AVIATION CLIMATOLOGY 5cp
Prerequisite AVIA207.
Hours 3 Hours per week for one semester.
Examination Progressive assessment plus a 2 hour final examination.

Content
Comparative urban and regional climatology. Implication for international flight planning and flying. Localised hazardous climates Europe; North America; the Atlantic routes; polar routes; Asia and the Pacific.

Text
To be advised.

AVIA318 AIRCRAFT STABILITY AND CONTROL 5cp
Prerequisite AVIA 118
Hours 3 Hours per week.

Aircraft stability and control, aerodynamic coupling, stick fixed / free longitudinal static stability, rudder, vane, c.g. margin, static margin, lateral and directional stability, configuration effects, control surface sizing. Introduction to Aeroscience.

References
Biological Sciences Subject Descriptions

BIO101 PLANT & ANIMAL BIOLOGY 10cp
Prerequisites Nil — see notes on BIO101 under "Assumed Knowledge for Entry to the Faculty".
Hours 6 Hours per week for one semester.
Examination One 3 hour paper.
Content
The course is organised into 2 units.
Unit 1
Plant Diversity — Form and Function.
Theme Structural specialization to facilitate efficient functional capacity.
Topics
The major plant groups and their life cycles. Higher plant structure and function. Plant diversity as a consequence of adaptation for survival in a range of environments.
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 - organisation of tissues and organs, body plans, body cavities, patterns of development.
Animal Function - digestion, circulation, respiration, integration and control, homeostasis, reproduction and development.

Texts

References

BIO102 CELL BIOLOGY, GENETICS & EVOLUTION 10cp
Prerequisites See notes on BIO101 under "Assumed Knowledge for Entry to the Faculty".
Hours 6 Hours per week for one semester.
Examination One 3 hour paper.

BIO101 PLANT & ANIMAL BIOLOGY 10cp
Prerequisites Nil — see notes on BIO101 under "Assumed Knowledge for Entry to the Faculty".
Hours 6 Hours per week for one semester.
Examination One 3 hour paper.

Content
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, evolution of cells.
Biological energy processes - photosynthesis, cellular respiration.
Genetics
An introduction to ecology.

Texts

References

BIO102 CELL BIOLOGY, GENETICS & EVOLUTION 10cp
Prerequisites BIO101, BIO102.
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.

Content
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, evolution of cells.
Biological energy processes - photosynthesis, cellular respiration.
Genetics
An introduction to ecology.

Texts

References

BIO103 BIOCHEMISTRY 10cp
Prerequisites BIO101, BIO102.
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.

Content

Texts

References

BIO1202 ANIMAL PHYSIOLOGY 10cp
Prerequisites BIO101, BIO102.
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.

Content
Consideration of the processes involved in the transport of oxygen in mammals and emphasizing the relation between structure and function. The course examines molecule, cell and tissue structure and function, particularly of nerve and muscle, and the respiratory, cardiovascular and control systems. Particular emphasis is given to physiological adaptations to the environment and the effects of the environment on physiological functions.

References

BIO1204 CELL AND MOLECULAR BIOLOGY 10cp
Prerequisites BIO101, BIO102.
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.

Content

Texts

References

BIO1205 MOLECULAR GENETICS 10cp
Prerequisites BIO101, BIO102.
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.

Content
Recombinant DNA technology and genetic engineering.

Texts

References
References

BIOLO206 PLANT PHYSIOLOGY
Prerequisites BIOLO101, BIOLO102
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.
Content
Fundamental processes peculiar to plant cells are examined. These include cell water relations, membrane transport of solutes, fixation of atmospheric nitrogen, and photosynthesis. Cellular regulation of the processes is emphasized.

Reference

BIOLO207 ECOLOGY
Prerequisites BIOLO101, BIOLO102.
Only one of BIOLO203 and BIOLO207 can be credited towards a degree.
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.
Content

Text
Reference

BIOLO301 CELL PROCESSES
Not offered in 1993.

BIOLO302 REPRODUCTIVE PHYSIOLOGY 10cp
Prerequisites Two BIOLO200.
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.
Content
Biological reproduction with particular emphasis on sexual differentiation and gamete physiology. Particular emphasis is given to physiological adaptations to the environment.


BIOLO303 ENVIRONMENTAL PLANT PHYSIOLOGY 10cp
Prerequisites Two BIOLO200.
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.
Content
Environmental impacts on whole plant growth are interpreted in terms of the responses of susceptible components of key physiological processes. The processes examined include whole plant water relations, photosynthesis, mineral ion acquisition and nutrient transport.


BIOLO304 WHOLE PLANT DEVELOPMENT 10cp
Prerequisites Two BIOLO200.
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.
Content
The co-ordinated development of the structural organization and functional capacity of plants from their meristems. The role of environmental parameters, plant growth regulators and selective gene expression in regulation of developmental patterns.

Issue, K. 1960, Anatomy of Seed Plants, Wiley.


BIOLO305 IMMUNOLOGY 10cp
Prerequisites Two BIOLO200.
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.
Content
Molecular and cellular aspects of the function of the immune system including phylogeny, reproductive and tumour immunology.


BIOLO307 MOLECULAR BIOLOGY OF PLANT DEVELOPMENT 10cp
Not offered in 1993.

BIOLO309 MOLECULAR BIOLOGY 10cp
Prerequisites BIOLO201 and BIOLO205.
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.
Content
How genes function and their control. Organisms and techniques used in recombinant DNA technology. Applications of recombinant DNA technology in biology and medicine. The generation of immunological specificity. The control of cell proliferation. The origins and genetic basis of cancer. The origins of life.
Special Conditions: Because of limitations of laboratory space and resources, student numbers in this subject will be limited to one laboratory class (48 students). Because the laboratory sessions need to be continuous, they will be held over four consecutive days during the September recess. Students intending to enrol in this subject are required to indicate this during the Semester 1 enrolment period.


BIOLO310 MICROBIOLOGY 10cp
Prerequisites BIOLO201 and one other BIOLO200 (BIOLO204 advisable).
Hours 6 Hours per week for one semester.
Examination One 2 hour paper.
Content
Bacteria, fungi, viruses, mycoplasma, protozoa and algae; comparative biochemistry; nutrient cycles; pathogenicity (interactions of agricultural and human significance); industrial microbiology/biotechnology.

Text
Prescott, L.M. 1990, Microbiology Harly & Klein.

Cano, R.I. & Colome, J.S. 1986, Microbiology West.

BIOLO311 ENVIRONMENTAL BIOLOGY 10cp
Only one of BIOLO306 and BIOLO311 may be credited towards a degree.
Prerequisites BIOLO203 or BIOLO207.
Hours 2 Hours of lectures per week for one semester. A three day field excursion and some laboratory classes.
Examination One 2 hour paper.
Content
The course covers applied aspects of both animal and plant ecology.

SECTION A Topics include:
Island ecology — the reduction in species diversity of communities and genetic variability within populations. Evolutionary prospects of island populations. Nature Reserves as ecological islands. Community change — succession, eutrophication and fire in the Australian environment. Evaluation of pest control methods (including biological control) on environmental and economic grounds as well as their short and long term effectiveness. Under population effects, particularly the relevance of threshold levels for endangered species.
The interaction between vegetation, 

The potential of microbiology for waste management

References


Biol312 Animal Development 10cp

Only one of Biol308 and Biol312 can be credited towards a degree.

Prerequisites Two Biol200

Hours 6 Hours per week for one semester.

Text

Examination One 2 hour paper.

Content

The course deals with cellular, cellular and physiological aspects of the development and differentiation of invertebrates and vertebrates. Specific topics include gametes & fertilization, cleavage & gastrulation, molecular biology of development, mammalian development and placentation, sex determination & differentiation, embryos & reproductive technologies, and abnormal development & the role of environmental agents.

References


redox equilibria and complexation in natural and waste waters; chemical aspects of microbial cycles; water pollution; nature and composition of the atmosphere; inorganic atmospheric pollutants; photochemical smog; atmospheric monitoring; an overview of energy sources.

Text


CHEM311 ANALYTICAL CHEMISTRY 10cp

Prerequisite CHEM212.

Hours 2 Hours of lectures, 1 hour of tutorials/workshops and 3 hours of laboratory work each week for one semester.

Examination One 2 hour paper. The laboratory work will count for 20% of the final assessment but a pass in the laboratory work is a prerequisite for a pass in the subject.

Content

Principles of selected instrumental techniques (e.g. emission spectroscopy and electro-analytical procedures). Solvent extraction; chromatography (theory and techniques).

Text


CHEM312 CHEMOMETRICS 5cp

Prerequisites CHEM211, MAT1102 (or MAT1112)

Hours 2 Hours of lectures, 1 hour of tutorials/workshops and 3 hours of laboratory work/assignments each week for half a semester.

Examination One 1 hour paper. The laboratory/assignment work will count for 20% of the final assessment but a pass in the laboratory/assignment work is a prerequisite for a pass in the subject.

Content

Use of computers in chemistry to improve the performance of procedures and to optimise measurement methods; and to enhance the analysis of measurements using linear and non-linear regression and factor analysis. Theory is exemplified with typical everyday problems.

Text

No formal text; material to be advised.

CHEM313 INDUSTRIAL CHEMICAL ANALYSIS 5cp

Prerequisite CHEM211.

Hours 2 Hours of lectures, 1 hour of tutorials/workshops and 3 hours of laboratory work/assignments each week for half a semester.

Examination One 1 hour paper. The laboratory/assignment work will count for 20% of the final assessment but a pass in the laboratory/assignment work is a prerequisite for a pass in the subject.

Content

A survey of selected techniques for specialized or high volume analysis used in areas as diverse as industrial, R&D, hospital and nuclear chemistry. Topics include electronic analytical signal processing; automated analysis (flow analysers, batch analysers, samplers); applications of computers and robots; X-ray/electron microprobe analysis; radiocarbon analysis; kinetic and enzymatic methods of analysis.

Text

No formal text; material to be advised.

CHEM314 TRACE ANALYSIS IN ENVIRONMENTAL SYSTEMS 5cp

Not available in 1993.

CHEM321 INORGANIC CHEMISTRY 10cp

Prerequisite CHEM221.

Hours 2 Hours of lectures, 1 hour of tutorials/workshops and 3 hours of laboratory work each week for one semester.

Examination One 2 hour paper. The laboratory work will count for 20% of the final assessment but a pass in the laboratory work is a prerequisite for a pass in the subject.

Content

A general course covering the range of modern inorganic chemistry, including synthesis, reactivity and applications of spectroscopic methods.

Text


CHEM322 METAL-METAL BONDING AND CLUSTER CHEMISTRY 5cp

Prerequisite CHEM221.

Hours 2 Hours of lectures, 1 hour of tutorials/workshops and 3 hours of laboratory work/assignments each week for half a semester.

Examination One 1 hour paper. The laboratory/assignment work will count for 20% of the final assessment but a pass in the laboratory/assignment work is a prerequisite for a pass in the subject.

Content

Metal-metal multiple bonding; lower halide clusters; structure and bonding in homonuclear and heteronuclear clusters; higher nuclearity clusters; clusters and catalysis; Zintl species.

Text

No formal text; material to be advised.

GENERAL INFORMATION

Principal Dates 1993

(See separate entry for the Bachelor of Medicine degree course.)

January

1 Friday Public Holiday — New Year’s Day
6 Wednesday Last day for return of Enrolment Application Forms — Containing Students

February

5 Friday New students accept UAC main round offer
12 Friday
TO New students enrol
22 Wednesday last day for payment of General Service Charge
March

1 Monday First Semester begins
30 Tuesday Last day for variation of program in relation to HBICS liability for Semester 1.
April

9 Friday Good Friday — Easter Reclos dates commence
19 Monday — Lectures Resume

May

7 Monday Public Holiday — Queen’s Birthday
11 Friday First Semester concludes — Last date for withdrawal from Semester 1 subjects.

June

14 Monday Mid year Examinations begin
30 Wednesday Closing date for applications for selection to the Bachelor of Medicine and Bachelor of Science (Aviation) in 1994.

July

2 Friday Mid Year Examinations end
19 Monday Second Semester begins

August

30 Monday Last day for variation of program in relation to HBICS liability for Semester 2.

September

25 Saturday Mid Semester recess begins

October

30 Thursday Closing date for UAC applications for enrolment in 1994 (Undergraduate courses other than Medicine and Aviation).

November

4 Monday Public Holiday — Labour Day
5 Friday Second Semester concludes — last date for withdrawal from Semester 2 and Full Year subjects.
8 Monday Annual Examinations begin
26 Friday Annual Examinations end

1994 February

Monday First Term begins¹

DATES FOR THE 1993 ACADEMIC YEAR FOR THE BACHELOR OF MEDICINE PROGRAM

Year 1

Semester 1 commences Monday 1 March, 1993

Monday 9 April 1993

Monday 16 April 1993

Monday 23 April 1993

Monday 30 April 1993

Monday 7 May 1993

Monday 14 May 1993

Monday 21 May 1993

Monday 28 May 1993

Monday 4 June 1993

Monday 11 June 1993

Monday 18 June 1993

Monday 25 June 1993

Semester 2 commences Monday 1 March, 1993

Monday 9 April 1993

Monday 16 April 1993

Monday 23 April 1993

Monday 30 April 1993

Monday 7 May 1993

Monday 14 May 1993

Monday 21 May 1993

Monday 28 May 1993

Monday 4 June 1993

Monday 11 June 1993

Monday 18 June 1993

Monday 25 June 1993

NOTE:

Semester One consists of Block One (10 weeks) and 7 weeks of Block Two.

Semester Two consists of the remaining 3 weeks of Block Two, all of Block Three (8 weeks), and Block Six (5 weeks).

¹ Date to be finalized
## ADVISE AND INFORMATION

### STUDENTS WITH DISABILITIES

Most services are located in the Temporary Buildings adjacent to the Computer Teaching Building except where indicated. Most services are also available on the Central Coast Campus.

The Dean of Students, Professor K.R. Dutton (located in the Bowman Building) is responsible for the network of Student Services and his assistance in service delivery is available to students whose appropriate. The Sub-Dean, Ms. M. Kirby (Hunter Building Room C18) will advise students on the correct procedures to follow in cases of appeal or grievance applications. Both can be contacted on 2151990.

### Accommodation Office

Offers advice on personal matters and assistance in resolving accommodation problems. Maintains lists of accommodation available off-campus in private homes, rooms, flat and houses. Ms. K. Daley, Accommodation Officer. Enquiries phone (049) 2151990.

### Careers & Student Employment Office

A free service to students at stage of their student covering all matters relating to employment: careers information and planning, resumes and interview preparation workshops, graduate recruitment, vacation employment and part-time student employment service. Ms. H. Parker, phone (049) 215584.

### Chaplaincy

The Chaplaincy Centers are located in the temporary buildings adjacent to the Computer Teaching Building and also in Room A17 in the Hunter Building near the Library. Pastoral and spiritual care is available from denominational chaplains. Phone (049) 215571 or (049) 216645.

### Counselling Service

Location: Courtyard level, Archway Library building. Assists people who are having academic or personal difficulties, or who simply want to function more effectively. Individual counselling and group courses are available. Phone (049) 215806.

### Health Service

Doctor's surgery is located in the Shortland Union building basement. Phone (049) 215806. A nurse is available on the main concourse of the Hunter Building, phone 215462. The health service offers medical care similar to a general doctor's surgery with a special interest in the health needs of students. Patients are bulk billed. All consultations are strictly confidential. Health education and information also provided. Dr. S. Brookman, phone (049) 216600.

### Sports & Recreation Office

Promotes, controls and administers all sporting activities of the University. Organises events in wide range of sporting and recreational pursuits. Provides assistance to student sport and recreation clubs. Coordinates participation in the Australian University championships. Advises the student accident insurance scheme on behalf of the Sports Union. Mr. A. Lakin, phone (049) 215584.

### Student Support Office

Student Services advises, students on financial, housing and other welfare matters and also available on the Central Coast Campus. Ms. R. Rudd, located in the Temporary Buildings opposite the Library, phone (049) 216647.

### Special Equipment

Special equipment is available in some lecture theatres and in the Library.

If you need academic assistance, please do not hesitate to contact your relevant Faculty Advisor.

### Faculty Advisors

| Architecture | Mr. Arden Kingland | (049) 215783 |
| Art Design & Comm. | Mr. Bruce Wilson | 216606 |
| Arts | Prof. A. Bardolph | 215372 |
| Economics & Commerce | Mr. Ansie Finlay | 216769 |
| Education | Ms. Margaret Davies | 216283 |
| Engineering | Dr. David Wood | 216198 |
| Health Science | Mr. Andrew Borsman | 216733 |
| Medicine | Dr. David Peters | 215625 |
| Music | Mr. Paul Curtis | 294133 |
| Nursing | Ms. Suzanne Lyons | 215512 |
| Science | Dr. Graham Hunter | 215209 |
| Social Science | Ms. Sue Mulcahy | 216787 |
| University Libraries | Ms. Elle Jones | 216465 |

### ENROLMENT OF NEW UNDERGRADUATE STUDENTS

Persons offered enrolment are required to attend in person at the Great Hall in February of the year prior to commencing. Detailed instructions are given in the Enrolment Guide which is sent out with the UC offer.

### TRANSFER OF COURSE

Students currently enrolled in an undergraduate course who wish to transfer to a different undergraduate course in 1993 must apply through the University Union (UUC or UC) by 30 September 1992. Late applications will be accepted through UC until 31 October if accompanied by a $65.00 fee. Late applications will be accepted after 31 October, but such applications will only be considered if places remain after applications that have been submitted prior to 31 October are considered.

If a student's request to transfer to another course is successful, the student must complete a separate Higher Education Contribution Scheme (HECS) Payment Form for the new course at enrolment time. Payment of the General Service Charge is made by using the notice issued as part of the re-enrolment process.

### RE-ENROLMENT BY CONTINUING STUDENTS

There are five steps involved for re-enrolment by continuing students:

1. **receive a re-enrolment kit in the mail**
2. **lodge the Enrolment Application form with details of your proposed program**
3. **pay the General Service Charge as required by the Commonwealth Bank by 26 February 1993**
4. **receive an approved program and student card**

### Re-Enrolment Kits

Re-enrolment kits for 1993 will be mailed to students in October. The re-enrolment kit contains the student's Enrolment Application and Statistical Form, the 1993 Class Timetable, the 1992 HECS brochure and Enrolment Guide.

A fees and charges notice will be mailed separately in late January of each year. Special attention is required to the fees and charges notice as this will not be sent out to all students (but all outstanding fees/bills have been paid).
Students are required to pay any debts incurred without delay.

STUDENT CARDS

Students will be mailed their Confirmation of Progress and Student Card in early February. The Student Card should be carried by students when at the University. The Student Card has machine-readable clothing to provide the University with information about students, but it is important to know the details of these circumstances be provided with the application to students.

If a student believes that a failure should not be recorded because of the circumstances leading to the failure, he or she should contact the relevant academic faculty or subject in question.

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

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examining paper that the calculator specified is a permitted aid. Calculation must be handwritten, battery operated and non-programmable, and students should note that no concession will be granted:
(a) to a student who is prevented from bringing into the room a programmable calculator
(b) to a student who uses a calculator incorrectly; or
(c) because of battery failure.

ENLISTED CANDIDATES
If you expect to sit for an examination and your name does not appear on the displayed seat allocation listing it could mean you are not formally registered as being enrolled and eligible to sit and receive a result. In these circumstances you will need to visit the Examinations Office to identify the problem. If an examining problem is solved you may also need to discuss the matter with your Faculty Officer.

RULES FOR FORMAL EXAMINATIONS
PART 1 - PRELIMINARY
Application of Rules
1. These Rules shall apply to all examinations of the University with the exception of the examination of a thesis submitted by a candidate for a degree of Master or the degree of Doctor of Philosophy. The examination of these degrees or the assessment of published works submitted for Higher Doctoral Degrees shall be conducted in accordance with the requirements for the degree.

Interpretation
2. In these Rules, unless the context or subject matter otherwise indicates or requires:
(a) "degree" means the degree, diploma (excluding graduate diploma and associate diploma) or graduate certificate for which a candidate is enrolled;
(b) "Department" means the department assigned responsibility for a particular subject and includes any other body or responsible;
(c) "Departmental Examinations Committee" means the Departmental Examinations Committee of the Committee constituted in accordance with the Rules governing Departments;
(d) "examining" includes any form of examination, assignment, test or any other work by which the final grade of a candidate in a subject is assessed;
(e) "external examiner for a candidate" means an examiner, not being a member of the staff of the University, appointed in attendance at the examination of an extended essay, project or similar work submitted by a candidate;
(f) "external examiner for the Department" means an examiner, not being a member of the staff of the University, appointed in attendance at the examining processes within a Department;
(g) "Faculty Board" means the Faculty Board of the Faculty responsible for the course in which a candidate is enrolled and includes a Board of Studies where given powers relevant to this Rule;
(h) "formal written examination" means an examination conducted under Part 4 of these Rules;
(i) "subject" means any part of a course of study by which a result may be recorded;
supervisor" means the supervisor for an examination appointed, in the case of a formal written examination, by the Academic Registrar and, in the case of any other examination, by the Head of Department;
(supplementary examination" means an examination administered to a candidate in respect of whom any doubt exists as to the judgement to be recorded in an examination return.

PART 2 - GENERAL
Examinations other than in single department
3. (1) Where a Faculty is not composed of Departments, the functions and responsibilities of the Head of a Department and the Departmental Examinations Committee shall be undertaken by the person or body in that Faculty approved for the purposes of these Rules by the Academic Senate.
(2) Where a subject is not the responsibility of a single Department, the person or body undertaking the functions and responsibilities of the Head of Department and the Departmental Examinations Committee in respect of that subject shall be decided by the Faculty Board concerned or, where Departments from more than one Faculty are involved, by the Academic Senate.

Determination of nature and extent of examining
4. Each Faculty Board shall determine the nature and extent of examining in the subjects in the awards for which the Faculty is responsible and such examining may be written, oral, clinical or practical or any combination of these.

Publication of requirements
5. The Head of Department shall ensure the publication of the Department's examination requirements for each subject by the end of the second week of the semester in which the subject commences including the weight and timing of each task comprising the total assessment to be applied in determining the final grade.

Penalties
6. An infringement of any of the rules set out in Rule 16(1), other than pursuant to Rule 16(2), or the instructions referred to in Rule 19 shall constitute an offence against discipline.

PART 3 - PROCEDURES
External Examiners
7. (1) The Academic Senate, on the recommendation of a Faculty Board made on the recommendation of a Department appoint one or more external examiners for the Department.
(2) Where a Department requests an external examiner for a subject, a decision shall be made by the Faculty Board of the Faculty in which the subject exists.
(3) A Faculty Board shall consider the recommendations of the Departmental Examinations Committee and, taking into account any change to a recommendation under sub-rule (1) or (2), shall decide:
(a) confirm the result; or
(b) defer the decision pending the outcome of any other action at the Faculty Board deems appropriate.

Grading of results in subjects
11. The result awarded in a subject to a candidate shall be one of those in the list of approved results determined by the Academic Senate from time to time.

Review of result in subject
12. (1) A candidate may apply for a review of any result awarded in a subject to that candidate.
(2) An application made under sub-rule (1) shall be made to the Academic Registrar on the prescribed form and accompanied by the prescribed fee.
(3) A review of the result shall include a check:
(a) that all required parts of the assessment have been included in the final determination of the result;
(b) that the content of scripts is properly considered, including, where possible, evidence of marks awarded by the examiner;
(c) that all marks contributing to the final grade have been correctly weighted and their total accurately obtained but shall not include any review of earlier assessments which have been made available to the candidate on a continuing basis throughout the subject.

Examination
8. The Head of each Department shall arrange for the members or members of the academic staff responsible for each of the subjects offered by the Department:
(a) to prepare the examination papers in the subject;
(b) to consult with any other member of the University who is involved in the supervision or supervision of the candidates to assess the scripts and other work submitted by candidates and, if required, prescribe a further or supplementary examination for any candidate;
(c) to record in an examinee's return a judgement in respect of each candidate for submission to the Departmental Examinations Committee.

Departmental recommendations of results
9. The Departmental Examinations Committee shall consider the recommendations of examiners for each candidate and shall make recommendations to the Faculty Board as to the result to be recorded for each candidate.

Determination of results in subjects
10. (1) The recommendations of the Departmental Examinations Committee shall be presented by the Faculty Board by the Head of the Department or the representative of that Head, who shall be notified to vary any recommended result if of the view that it is inappropriate to do so on the request of the Faculty Board.
(2) The Dean shall ensure that in making its recommendations the Departmental Examinations Committee has considered any request for special consideration made by a candidate pursuant to Rule 13.
(3) Each Faculty Board shall consider the recommendations of the Departmental Examinations Committee and, taking into account any change to a recommendation under sub-rule (1) or (2), shall decide:
(a) confirm the result; or
(b) defer the decision pending the outcome of any other action at the Faculty Board deems appropriate.

Part 4 - Formal Written Examinations
Responsibility
14. The Academic Registrar shall be responsible for the administration and supervision of the examinations of the University.

Timetable for formal written examinations
15. (1) The Academic Registrar shall publish a timetable showing when and where formal written examinations will be held and shall state the responsibility of candidates to attend those examinations prescribed for the subjects in which they are enrolled.
(2) Notwithstanding the provisions of Rule 15(1), where the Academic Registrar considers it justified on religious, conscientious or other grounds, special arrangements may be made to allow a candidate to attend a prescribed examination for a subject at a time and place different from that published in the examination timetable.
(3) Subject to the provision of Rule 13(1)(b), candidates who fail to attend an examination which is shown on the examination timetable will be deemed to have sat for and failed the examination.

Rules for formal written examinations
16. (1) Formal written examinations shall be conducted in accordance with the following:
(a) candidates shall comply with any instructions given by an examiner relating to the conduct of the examination;
(b) before the examination begins candidates shall not read the examination paper until granted permission by the examiner which shall be given ten minutes before the start of the examination;
(c) no candidate shall enter the examination room after thirty minutes from the time the examination has begun;
(d) no candidate of staff shall be in the examination rooms during the first thirty minutes or the last ten minutes of the examination;
(a) no candidate shall re-enter the examination room after leaving it unless during the period of absence that candidate has been under approved supervision;
(b) a candidate shall not remove from the examination room any bag, paper, book, written material, device or aid, whatever other than such as may be specified for the particular examinations;
(c) a candidate shall not by any means obtain or endeavour to obtain improper assistance, give or endeavour to give assistance to any other candidate, or commit any breach of good order;
(d) a candidate shall not take from the examination room any examination answer book, any examination paper to mark, marked examination paper, or any other material issued for use during the examination.

(2) no candidate may smoke in the examination room.

(3) the provisions of sub-rule (1) may be relaxed:
(a) by the Academic Registrar; and
(b) with the exception of paragraphs (a), (d) and (e) by the supervisor upon the direction of the Academic Registrar or at the discretion of the supervisor, provided that the circumstances of any case in which discretion has been exercised shall be recorded in writing in the Academic Registrar immediately following the conclusion of the examination.

PART 5 - OTHER RESPONSIBILITIES

EXAMINATION Timetable

1. The Head of Department shall be responsible for the administration and supervision of the examinations of the University, other than formal written examinations, in the subjects offered by the University.

2. The University shall maintain a timetable showing when and where examinations will be held. This timetable shall be published in the academic calendar of the academic year.

3. All candidates shall be responsible for the administration of the examinations prescribed for the subjects in which they are registered. This includes the submission of their examination papers on the specified dates.

SPECIAL CONSIDERATION REQUESTS

Applications for Special Consideration Requests shall be made on the Application Form for Special Consideration Requests, which is available from the Registrar immediately following the conclusion of the examination. The Application Form shall be submitted together with a recommendation for such assistance as the candidate requires. The application shall be dealt with as soon as practicable by the Special Consideration Committee.

FINAL EXAMINATION RESULTS

(1) The results of the final examination will be released within thirty days of the last day of the examination period, unless there is a special request for an extended period.

(2) The Registrar, on the recommendation of the Special Consideration Committee, may extend the time for the release of results for a candidate who has applied for Special Consideration, provided that the candidate has submitted the necessary documentation.

(3) The results of the final examination will be released to the candidates on the specified dates, which will be determined by the Registrar following the conclusion of the examination. The results will be made available in the manner specified by the University, which may include online access, delivery by mail, or other means.

(4) The registrar shall be responsible for the administration of the examination results. This includes the compilation of examination results, the distribution of examination results to candidates, and the handling of any appeals or requests for re-evaluation of results.

(5) The examination results will be made available to candidates within the time frame specified by the University. In the event of any dispute, the candidate may appeal to the University's Appeals Committee, which will hear the appeal and make a decision.

(6) The examination results will be made available to candidates on the specified dates, which may be determined by the University. The results will be made available in the manner specified by the University, which may include online access, delivery by mail, or other means.

(7) The results of the examination will be made available to the candidate on the specified dates, which may be determined by the University. The results will be made available in the manner specified by the University, which may include online access, delivery by mail, or other means.

(8) The examination results will be made available to the candidate on the specified dates, which may be determined by the University. The results will be made available in the manner specified by the University, which may include online access, delivery by mail, or other means.

(9) The examination results will be made available to the candidate on the specified dates, which may be determined by the University. The results will be made available in the manner specified by the University, which may include online access, delivery by mail, or other means.

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(17) The examination results will be made available to the candidate on the specified dates, which may be determined by the University. The results will be made available in the manner specified by the University, which may include online access, delivery by mail, or other means.

(18) The examination results will be made available to the candidate on the specified dates, which may be determined by the University. The results will be made available in the manner specified by the University, which may include online access, delivery by mail, or other means.

(19) The examination results will be made available to the candidate on the specified dates, which may be determined by the University. The results will be made available in the manner specified by the University, which may include online access, delivery by mail, or other means.

(20) The examination results will be made available to the candidate on the specified dates, which may be determined by the University. The results will be made available in the manner specified by the University, which may include online access, delivery by mail, or other means.
SCHOLARSHIP HOLDERS AND SPONSORED STUDENTS

CHARGES

The General Services Charge (details below) is payable by all students.

In 1993, a fees and charges notice will be sent to all continuing students in late January and to commencing students in mid February.

Students are expected to pay charges at any Commonwealth Bank. The due date for the payment of charges with the Commonwealth Bank is 26 February 1993.

All other payments should be made directly to the University by cheque, or in person to the Cashier, Level 3, Chancellery.

1. General Services Charge

(a) Student proceeding to a Degree or Diploma

- Plan Students joining Newcastle University

- Union for the first time

(b) Non-Degree Students

- Newcastle University Union Charge

(c) External Students

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

2. Late Charges

Where the Fees and Charges Notice is lodged with all charges payable after the 26 February 1993

$50

3. Other Charges

(a) Examination centre special supervision per paper

$10

(b) Review of examination results, per subject

$25

(c) Replacement of Re-enrolment kit

$10

(d) Replacement of Student Card

$5

(e) Statement of Matriculation Status

$10

(f) Replacement of lost or damaged Transcript

$30

4. Academic Transcripts

(i) First Copy

$10

(ii) Second Copy

No charge

(iii) Each additional copy

$1

Note:

(i) Graduates will be provided with two copies of their transcript free upon notification of eligibility.

(ii) Transcripts will be issued on request free of charge to tertiary education institutions.

5. Indebted Students

All debts outstanding to the University must be paid before enrolment can be completed—part payment of total amount due will not be accepted.

HIGHER EDUCATION CONTRIBUTION SCHEME (HECS)

The Higher Education Contribution Scheme (HECS) requires students to contribute towards the cost of their higher education. Each semester a student’s HECS liability is calculated according to his or her Student Load. The liability for an 80 credit point full-time load in 1993 is $2238.00. Student Load is calculated at the census date each semester i.e. 31st March in Semester One and 31st August in Semester Two. Withdrawals are effective only after the census date and failed subjects incur HECS liability.

Some courses are exempt from HECS charges and some students are exempt. Exemption from payment of the Higher Education Contribution (HECS) applies to:

- a fee-paying student in a “fee-approved postgraduate award course”

- a student in a “basic nurse education course”

- a “full-fee-paying overseas student”

- a “student who has paid the Overseas Student Charge”

- a fully sponsored overseas student

- a student in an “enabling course”

- a student in a “non-fee-paying” course

- a student who has been awarded a “HECS postgraduate scholarship”

Basic Nursing education courses will not be exempt from HECS after 1993. Currently enrolled students continuing their studies in such a course will also be liable for HECS in 1994 and in subsequent years.

HECS is administered as part of the enrolment process. Students commencing a new course must select one of these sections on the HECS Payment Options form.

On enrolment students must do one of the following:

(a) Elect to pay up-front which would require payment of 75% of the contribution for the semester, with the balance to be paid by the Commonwealth. Students electing to pay up-front will be asked to pay at the commencement of each semester.

(b) Elect to defer payment until their taxable income exceeds a maximum threshold level for the 1991-92 financial year. The maximum threshold was $27,098. This amount will be increased each year.

(c) Elect to defer payment until they graduate. Non-Degree Students

Students continuing their studies in such a “non-award” course will be required to pay on enrolment until their taxable income exceeds a maximum threshold level for the 1991-92 financial year. The maximum threshold was $27,098. This amount will be increased each year.

LOANS

Students who do not have sufficient funds to pay the General Service Charge should seek a loan from their bank, building society, credit union or other financial institution.

An application for a loan from the student loan funds is payable to the Commonwealth Bank by 26 February 1993. Students wishing to apply for a loan must complete the attached loan form and lodge it with the University Loan Funds Administrator, for further details contact. The Student Support Officer, Ms Annette Ruddle, (02) 24618067 to arrange an appointment.

REPAYMENT OF CHARGES

A refund of the General Services Charge paid on enrolment will be made when the student notifies the Student Officers of completion of a semester from studies under the following conditions:

(i) When a student notifies the University of a complete withdrawal from studies by the following dates, a refund will apply:

- Notification on or before 31 March

- Notification before the end of first semester

(ii) When a student elects to defer his or her HECS contribution up-front.

- Notification on or before 31 August

- Notification after the end of first semester

Any change of address must be notified.

For students continuing their studies in such a “non-award” course withdrawal students will retain their elected payment option.

A refund cheque will be mailed to a student or if applicable, a bank, building society, credit union, etc. upon the University.

Students are urged to consider alternative modes of transport, such as public transport, and greater use of bicycles to take advantage of the new University parking arrangements. Students. It is to the interests of all members of the University community, and to the development and maintenance of the campus built up setting, to dramatically reduce the numbers of vehicles being brought on campus, as well as assisting with the benefits of air pollution, traffic congestion and the like.

All students are required to read the Traffic and Parking Regulations, which form a part of the University Calendar Volume I. The rules for traffic and parking infringements are contained in the rules are as follows:

(a) exceeding the speed limit on University roads

(b) failing to stop when signalled to do so by an Attendee (Parked)

(c) refusal to provide information requested by an Attendee (Parked)

(d) failing to obey instructions given by an Attendee (Parked)

(e) illegal parking

(f) parking on University roads

(g) parking on footpaths

(h) parking in a way that may risk injury to others

(i) not displaying parking permit

(j) parking in a restricted area

(k) parking in an area reserved for handicapped persons

(l) any other breach of the traffic and parking rules

The penalty will be imposed:

(a) on the spot by an infringement notice being posted on the vehicle, or

(b) by sending an infringement notice by ordinary post to the registered person responsible for the vehicle, or to the registered owner of the vehicle.

Any objection to the imposition of the penalty must include full details of the grounds on which the objection is based and be lodged in writing with the Director Property Services within 14 days of the date the infringement notice shows the breach as having been committed.

The Director Property Services, after considering an objection, shall inform the registered person responsible for the vehicle of the decision.

Penalties must be paid:

(a) within 28 days of the date the infringement notice shows the breach as having been committed or

(b) where applicable, within 28 days of notification that any objection has been rejected by the Director Property Services.

The Director Property Services, in any case, may refer to the Security and Parking Office, located in the foyer of the Great Hall and the Property Services Office, located in the foyer of the Hunter Building.
and Commerce, Education, Engineering, Medicine, Science and Social Sciences. It holds an extensive range of
government publications, microforms, audiovisual media, archival materials and a Rare Book Collection. Specialist services are provided in
Biomedicine, Law, and audiovisual media.

Other services include: Loans, Short Loans, CD-ROMs, Online Searching, Reference Service, Inter Library Services, Archives.
The Short Loan Collection contains materials of high demand: students may borrow these for restricted periods.
The Biomedical Reading Room houses books, serials, pamphlets and reference material in Biological Sciences and Medicine, i.e. within the
classification range Q16.67-016.619 and 570-619. It also includes a special area, in Medical Resource, which holds a variety of resources and equipment
supporting the Faculty of Medicine's innovative and highly
resource-dependent curriculum.

Collections of resources are also maintained in seven country centre
hospitals for the use of students in clinical learning stages: Taree,
Tamworth, Coffs Harbour, Maitland, Orange, Lithgow and Dubbo. There is a
formal agreement between the University and the Area Health Board on
the operation of the Gardner Library Service under which registered
users of the Auchmuty and Gardner Libraries enjoy complete reciprocity.
The Law Reading Room houses books, serials, and primary law
materials including law reports, acts, bills and regulations.
The Audiovisual section includes computer-based multimedia.

Further information and assistance can be obtained at the Auchmuty
Library Reference Desk, phone 21585.

Huxley Library
Located in the Hunter Building, this Library supports the teaching and
research requirements of the Faculty of Health Sciences, Nursing,
Education and Art, Design and Communication. The Library has an
extensive collection of audiovisual media and curriculum material and
receives all publications from the New South Wales Department of School Education.

Other services include: Loans, Reference Service, CD-ROMs, Online
searching, Inter-Library Services, External Studies Service, Short Loans.
Borrowers may have access to the Short Loan Collection for restricted
periods.

Further information and assistance can be obtained at the Huxley Library
Reference Desk, phone 216453.

Newcastle Conservatorium of Music Library
The Library contains a collection of books, serials, scores and CDs, and
sound recordings. It is located in the Conservatorium of Music, on the corner of Gibson and Auckland Streets, in the city.

Other students and staff of the Conservatorium of Music can borrow from its Library. This includes Music Education students enrolled on
campus.

Further information can be obtained by contacting the Librarian on
294113.

Central Coast Campus Library
The Library has a small but growing collection of books, serials and
audiovisual media which supports teaching programmes in Business, Social Sciences and Education.

Further information can be obtained by ringing (043) 620277.

Gardiner Library Service
There are three separate libraries within the service: the John Hunter
Hospital Branch, the Royal Newcastle Hospital Branch and the Mater
Hospital Branch. The specific opening hours for these libraries will be
published through NEWCAT and the appropriate library guides.

Further information can be obtained by ringing 21 3779.

Borrowing/Identification Cards
Students need an identification card to borrow. Please remember to
carry your card with you at all times if you wish to borrow or use library
facilities. If books are borrowed on your card by anyone else, you are
responsible for them. Report any lost card to the Loans Desk staff
immediately to prevent misuse. Replacement cards are available for
$5.00 from the Student Division Office in the Chancellery.

Borrowing Rights
For the details of loan conditions students should refer to the Library
Guide and the various handouts published at the beginning of each year.

Books can be borrowed from the Library from which they were borrowed.
A fine of $2.00 per item is levied when material is two days overdue.
The fine will increase by 50 cents per day per item until the material is
returned. Borrowing rights are also withdrawn. If library material is lost
or damaged, the replacement cost, plus a processing fee, will be charged.

Access to Information
Library facilities include the computerised catalogue NEWCAT, which
provides direct access to information about materials held in the
Auchmuty, Huxley, Conservatorium, Central Coast and Area Health
Libraries. The Auchmuty and Huxley Libraries also hold databases on
CD-ROM to enable students and staff to find journal articles in their
subject areas. The print versions of the databases are available in the
Reference Collection for manual searching. Some are on computerised
data bases available via telecommunication networks. AANet, the
Australian Academic Network, provides access to others.

Photocopying
Photocopying facilities are available in all University Libraries. The
machines are operated by magnetic-strip cards which can be purchased
in the Library. Credits for the photocopyers can be added to these
cards from a dispenser as many times as needed. Users must observe the
relevant Copyright Act provisions which are on display near the
photocopyers.

Inter Library Services
This service is available to academic staff, higher degree and honours
final year students. Material not held in the University of Newcastle
Libraries may be obtained from other libraries within Australia or
overseas. Books and serials readily available in Australia should
arrive within two weeks. A Fast Track Service is available, at extra cost,
for urgent requests.

Disabled Persons
All libraries provide access for disabled students and staff. Both Auchmuty
and Huxley Libraries provide special services for physically disabled
and visually impaired library users. Contact librarians at each Library
will help with information about the library, parking, lift keys and other
facilities such as the Braille Library, a Kurzweil machine which reads
aloud from English printed text and access to large-print NEWCAT, the
University Libraries' online catalog. Please phone 213851.

Hours of Opening
AUCHMUTY LIBRARY
Term Hours:
Monday to Thursday: 8.30am to 7.00pm
Friday: 8.30am to 5.00pm
Saturday & Sunday: Closed

Semester Breaks:
Monday to Friday: 8.30am to 5.00pm
Saturday: Closed

HUXLEY LIBRARY
Term Hours:
Monday to Thursday: 8.30am to 5.00pm
Friday: 8.30am to 5.00pm
Saturday: Closed

Semester Breaks:
Monday to Friday: 8.30am to 5.00pm
Saturday & Sunday: Closed

UNIVERSITY LIBRARIES
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>ECTS</th>
<th>Prerequisite(s)</th>
<th>Hours</th>
<th>Examination</th>
<th>Content</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM323</td>
<td>BIOMINERALOGIC COORDINATION CHEMISTRY</td>
<td>5</td>
<td>CHEM221</td>
<td>2 Hours of lectures, 1 hour of tutorials/workshops and 3 Hours of laboratory work/assignments each week for half a semester.</td>
<td>Examination One 1 hour paper. The laboratory/assignment work will count for 20% of the final assessment but a pass in the laboratory/assignment work is a prerequisite for a pass in the subject.</td>
<td>Synthesis of complexes of multidentate and macrocyclic ligands; metal-directed reactions and stereochemistry; metalloproteins and metalloenzymes; bioelectrochemistry and redox proteins.</td>
<td>No formal text; material to be advised.</td>
</tr>
<tr>
<td>CHEM331</td>
<td>ORGANIC CHEMISTRY</td>
<td>10</td>
<td>CHEM231</td>
<td>2 Hours of lectures, 1 hour of tutorials/workshops and 3 Hours of laboratory work each week for one semester.</td>
<td>Examination One 2 hour paper. The laboratory work will count for 20% of the final assessment but a pass in the laboratory work is a prerequisite for a pass in the subject.</td>
<td>The central theme of this course will be organic synthesis. A survey of important synthetic reactions for functional group transformations and carbon-carbon bond formation with emphasis on the stereo- and stereoselectivity and mechanisms of these reactions. Systematic approach to synthesis - the disconnection/synthon method. Examples of syntheses and discussion of some literature classics.</td>
<td>No formal text; material to be advised.</td>
</tr>
<tr>
<td>CHEM332</td>
<td>HETEROCYCLIC CHEMISTRY</td>
<td>5</td>
<td>CHEM221</td>
<td>2 Hours of lectures, 1 hour of tutorials/workshops and 3 Hours of laboratory work/assignments each week for half a semester.</td>
<td>Examination One 1 hour paper. The laboratory/assignment work will count for 20% of the final assessment but a pass in the laboratory/assignment work is a prerequisite for a pass in the subject.</td>
<td>The synthesis, reactions and spectroscopic properties of five and six membered heterocycles containing one or two N, O and S atoms and their benzo-analogs.</td>
<td>Davies, D.T. 1992, Aromatic Heterocyclic Chemistry, Oxford University Press.</td>
</tr>
<tr>
<td>CHEM333</td>
<td>ORGANIC REACTION MECHANISM</td>
<td>5</td>
<td>Not available in 1993.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM334</td>
<td>IDENTIFICATION OF NATURAL COMPOUNDS</td>
<td>5</td>
<td>CHEM231</td>
<td>2 Hours of lectures, 1 hour of tutorials/workshops and 3 Hours of laboratory work/assignments each week for half a semester.</td>
<td>Examination One 1 hour paper. The laboratory/assignment work will count for 20% of the final assessment but a pass in the laboratory/assignment work is a prerequisite for a pass in the subject.</td>
<td>The course explores several case studies from the chemical literature in which the isolation, purification and identification of bacterial, fungal, plant or marine secondary metabolites are reported. Topics such as chromatographic methods, spectroscopy, simple procedures and biosynthesis will be discussed in the context of the identification of small organic compounds such as terpenes, steroids and oligopeptides.</td>
<td>No formal text; material to be advised.</td>
</tr>
<tr>
<td>CHEM335</td>
<td>ORGANIC SPECTROSCOPY</td>
<td>5</td>
<td>CHEM221</td>
<td>2 Hours of lectures, 1 hour of tutorials and 3 Hours of workshops/laboratory each week for half a semester.</td>
<td>Examination One 1 hour paper. The laboratory/workshop work will count for 20% of the final assessment but a pass in the laboratory work is a prerequisite for a pass in the subject.</td>
<td>The course will cover applications of ultraviolet/visible, infrared, $^1$H and $^{13}$C nuclear magnetic resonance and mass spectrometry in the structural elucidation of organic compounds.</td>
<td>Williams, D.H. and Fleming, I. 1988, Spectroscopic Methods in Organic Chemistry, 4th edn, McGraw-Hill.</td>
</tr>
<tr>
<td>CHEM341</td>
<td>PHYSICAL CHEMISTRY</td>
<td>10</td>
<td>CHEM221, MATH102 (or MATH112)</td>
<td>2 Hours of lectures, 1 hour of tutorials/workshops and 3 Hours of laboratory work each week for one semester.</td>
<td>Examination One 2 hour paper. The laboratory work will count for 20% of the final assessment but a pass in the laboratory work is a prerequisite for a pass in the subject.</td>
<td>Electronics - the metal solution interface and structure of the double layer, rates of charge transfer reactions; determination of charge transfer reaction mechanisms; electrochemical techniques; introduction to corrosion.</td>
<td></td>
</tr>
</tbody>
</table>
### CHEMISTRY SUBJECT DESCRIPTIONS

**CHEM261 ENVIRONMENTAL CHEMISTRY** 10cp

**Prerequisite** CHEM261.

- **Hours:** 2 hours of lectures, 1 hour of tutorials/workshops, and 3 hours of laboratory work/assignments each week for one semester.

- **Examination:** 1 hour paper.

- **Content:** This course examines the environmental planning and development control system in N.S.W. Reference is also made to environmental impact assessment (EIA) and the various requirements for environmental assessment for different types of development. A number of local and regional case studies will be examined to illustrate the various legislative requirements.


**CHEM361 ENVIRONMENTAL CHEMISTRY** 10cp

**Prerequisite** CHEM261.

- **Hours:** 2 hours of lectures, 1 hour of tutorials, and 3 hours of laboratory/library/workshop/site visits each week for one semester.

- **Examination:** One 2 hour paper. The laboratory/library/workshop/site visits will count for 20% of the final assessment but a pass in this work is a prerequisite for a pass in the subject.

- **Content:** Principles laid down in CHEM261 will be expanded into a more detailed treatment of the chemistry of the hydrophere, the atmosphere, and the geosphere. Specific topics include gas-liquid-solid interactions in water chemistry, water treatment methods; environmental chemistry of the geosphere; particulate matter in the atmosphere; organic pollutants in the atmosphere and geosphere; environmental toxicology; the nature, sources, and chemistry of hazardous wastes.


### ENVIRONMENTAL SCIENCE SUBJECT DESCRIPTIONS

**SCEN101 ENVIRONMENTAL INVESTIGATIONS I** 10cp

- **Prerequisite:** SCEN201.

- **Hours:** 3 hours per week for two semesters.

- **Examination:** Progressive assessment and one 2 hour paper at the end of semester 2.

- **Content:** A case study approach, utilizing the basic sciences to solve introductory environmental problems associated with human activity.


**SCEN201 ENVIRONMENTAL INVESTIGATIONS II** 10cp

- **Prerequisite:** SCEN101.

- **Hours:** 3 hours per week for two semesters.

- **Examination:** Progressive assessment and one 2 hour examination at the end of semester 2.

- **Content:** A field-based study, utilizing analytical techniques from a range of scientific disciplines to investigate and provide solutions to environmental problems associated with human activity.

- **Text:** To be advised.

**SCEN202 ENVIRONMENTAL IMPACT ASSESSMENT TECHNIQUES** 10cp

- **Prerequisite:** SCEN202.

- **Hours:** 4 hours per week for one semester.

- **Examination:** Progressive assessment and one 2 hour paper at the end of the semester.

- **Content:** This course will examine the rationale and methodology of environmental impact assessment (EIA) and will look at a number of impact assessment techniques in practice. The phenomenons of EIA will be discussed and current developments in environmental management will be examined. Reference will also be made to environmental documentation prepared for various developments.


**SCEN301 ENVIRONMENTAL PROJECT** 10cp

- **Prerequisite:** SCEN201.

- **Hours:** 4 hours per week for one semester.

- **Examination:** Progressive assessment and one 2 hour paper at the end of the semester.

- **Content:** An investigation and report of an environmental problem of interest to the student utilizing scientific methodology.

**SCEN302 ENVIRONMENTAL IMPACT ASSESSMENT TECHNIQUES** 10cp

- **Prerequisite:** SCEN202.

- **Hours:** 4 hours per week for one semester.

- **Examination:** Progressive assessment and one 2 hour paper at the end of the semester.

- **Content:** This course examines many of the major environmental issues associated with water resources development in Australia. Following an introduction to hydrology and water quality in the catchment ecosystem, issues covered include reservoir management, eutrophication, dredging, channelization, wetland and floodplain management, irrigation/subirrigation and wastewater disposal. Catchment management is introduced as the basis for water resources planning and management.

- **Text:** To be advised.
Geography Subject Descriptions

**GEOG101 INTRODUCTION TO PHYSICAL GEOGRAPHY** 10cp

Prerequisites Nil. Students should note that GEOG101 and GEOG102 are prerequisites for the Geography Major in Arts and Science, and for Geography Honours GEOG401 and GEOG402.

**GEOG102 INTRODUCTION TO HUMAN GEOGRAPHY** 10cp

Prerequisites Nil. Students should note that GEOG101 and GEOG102 are prerequisites for the Geography Major in Arts and Science, and for Geography Honours GEOG401 and GEOG402.

**GEOG201 METHODS IN PHYSICAL GEOGRAPHY** 10cp

Prerequisite GEOG101.

**GEOG202 METHODS IN HUMAN GEOGRAPHY** 10cp

Prerequisite GEOG102.

**GEOG203 BIOGEOGRAPHY AND CLIMATOLOGY** 10cp

Prerequisite GEOG101.

**GEOG204 GEOMORPHOLOGY OF AUSTRALIA** 10cp

Prerequisite GEOG101.

**GEOG207 POPULATION, CULTURE AND RESOURCES** 10cp

Prerequisite GEOG102.

**GEOG301 ADVANCED METHODS IN PHYSICAL GEOGRAPHY** 10cp

Prerequisite GEOG201 plus either GEOG203 or GEOG204.

**GEOG302 ADVANCED METHODS IN HUMAN GEOGRAPHY** 10cp

Prerequisites GEOG202 plus either GEOG205 or GEOG206.

**GEOG303 THE BIOSPHERE AND CONSERVATION** 10cp

Prerequisite GEOG203.

**GEOG304 CLIMATIC PROBLEMS** 10cp

Prerequisite GEOG203 or permission of Head of Department.

**GEOG305 GEOGRAPHY OF AUSTRALIA** 10cp

Prerequisites GEOG203 plus either GEOG205 or GEOG206.

**GEOG306 GEOGRAPHY OF AUSTRALIA AN HISTORICAL PERSPECTIVE** 10cp

Prerequisites GEOG203 plus either GEOG205 or GEOG206.

**GEOG401 SEQUENCES IN HUMAN GEOGRAPHY** 10cp

Prerequisite GEOGI01.

**GEOG402 INTRODUCTION TO PHYSICAL GEOGRAPHY** 10cp

Prerequisite GEOG401.

**GEOG403 CLIMATOLOGY AND WEATHER** 10cp

Prerequisite GEOG402.

**GEOG404 ADVANCED METHODS IN HUMAN GEOGRAPHY** 10cp

Prerequisite GEOG403.

**GEOG405 ADVANCED METHODS IN PHYSICAL GEOGRAPHY** 10cp

Prerequisite GEOG404.

**GEOG406 GEOGRAPHY OF AUSTRALIA AN HISTORICAL PERSPECTIVE** 10cp

Prerequisite GEOG405.

**GEOG407 POPULATION, CULTURE AND RESOURCES** 10cp

Prerequisite GEOG406.

**GEOG408 THE BIOSPHERE AND CONSERVATION** 10cp

Prerequisite GEOG407.

**GEOG409 CLIMATIC PROBLEMS** 10cp

Prerequisite GEOG408.

**GEOG410 GEOGRAPHY OF AUSTRALIA** 10cp

Prerequisite GEOG409.

**GEOG411 GEOGRAPHY OF AUSTRALIA AN HISTORICAL PERSPECTIVE** 10cp

Prerequisite GEOG410.
**SE88ION FIVE**

**GE8O9309 SOCIETY $ SPACE**

**Prerequisites** GEOG202 plus either GE0G205 or GEOG206.

**Hours** 4 Hours per week for one semester; 2 days fieldwork/ project work.

**Examination** Progressive assessment and one 2 hour paper at the end of the semester.

**Content**

This course examines the interaction of social groups with each other and with the urban environment. A variety of social groups defined by ethnic and socio-economic status, family structure and gender will be studied. The course will use a variety of methodological approaches to socio-spatial behaviour.

**GE8O9310 DIRECTED STUDIES IN HUMAN GEOGRAPHY**

**Prerequisites** GEOG202 plus either GEOG205 or GEOG206.

**Hours** 4 Hours per week for one semester; 2 days fieldwork/ project work.

**Examination** Progressive assessment and one 2 hour paper at the end of the semester.

**Content**

This course will normally be given by a visiting lecturer - the subject to be advised.

**GE8O9311 HYDROLOGY**

**Prerequisites** GEOG201, GEOG203.

**Hours** 4 Hours per week for one semester; 2 days fieldwork.

**Examination** Progressive assessment and one 2 hour paper at the end of the semester.

**Content**

The course examines the distribution of water in the environment. Most attention will be given to atmospheric moisture, the hydrologic cycle, catchments, runoff, soil and surface and sub-surface waters. Water resources are also considered.

**Text**


**GE8O9315 PRODUCTION, WORK AND TERRITORY**

**Prerequisites** GEOG202 plus either GEOG205 or GEOG206.

**Hours** 4 Hours per week for one semester; 2 days fieldwork.

**Examination** Progressive assessment and one 2 hour paper at the end of the semester.

**Content**

The course examines contemporary changes in production, distribution and consumption, by referring to agriculture, manufacturing and services. It focuses on the geography of employment and industrial change, and the evolution of food supply systems.

Topics include: the territorial organisation of production, the role of large corporates, agribusiness, technological change, the farm problem, divisions of labour and the changing nature of work, and the changing role of the state.

Case studies of impacts of economic change on people and communities are drawn from the Asia-Pacific basin, and from visits in the Hunter.

**Texts**


Lawrence, G. 1988, Capitalism and the Countryside, Pluto Press.

**GE8O9316 DIRECTED STUDIES IN PHYSICAL GEOGRAPHY**

Not offered in 1993.

**GE8O9317 THE ENVIRONMENT**

**Hours** 6 Hours per week for one semester, including lectures, practicals and field excursions. The course is repeated in the evening in Semester I.

**Examination** One 3 hour paper, assignments and laboratory practicals.

**Content**

A lecture, field and practical course which examines in the widest context the evolution of our planet and man's environment.

Specific topics are the Earth in space; evolution and dynamics of the planet Earth; evolution of the atmosphere; hydrosphere, biosphere and life; the impact of climatic change; structures produced as a result of plate collision.

**Texts**

Consult lecturers concerned.

**GE8O9318 EARTH MATERIALS**

**Prerequisites** GEOG1017 Environment.

**Hours** 6 Hours per week for one semester, including lectures, practicals and excursions.

**Examination** One 3 hour paper, assignments and practical examinations.

**Content**

A course dealing with geological structures and economic resources. It will be supported by field excursions in the local area.

**Texts**

Consult lecturers concerned.

**GE8O9319 GEOLOGICAL STRUCTURES AND RESOURCES**

**Prerequisite** GEOG102.

**Hours** 6 Hours per week for one semester, including lectures, practicals and field excursions.

**Examination** One 3 hour paper, class assignments and practical examinations.

**Content**

A practical introduction to the petrology and petrology of igneous and sedimentary rocks.

**Text**


**GE8O9320 ANCIENT ENVIRONMENTS AND ORGANISMS**

**Not to count for credit with GEOG203**

**Hours** 6 Hours per week for one semester, including lectures, practicals and field excursions.

**Examination** One 3 hour paper, class assignments and practical examinations.

**Content**

A course investigating ancient sedimentary environments with the evolution and morphogenesis of ancient life, stratigraphic relationships and time. The course will be supported by field excursions in the local area.

**Texts**

Consult lecturers concerned.

**GE8O9321 INTRODUCTORY PETROLOGY**

**Not to count for credit with GEOG205, GEOG206**

**Hours** 14 days field work in 2 or 7 day sessions for one semester (February, week before Semester I, Easter break).

**Examination** By report.

**GE8O9322 PETROLOGY**

**Prerequisite** GEOG102.

**Hours** 14 days field work in 2 or 7 day sessions for one semester (February, week before Semester I, Easter break).

**Examination** By report.

**GE8O9323 INTRODUCTORY PETROLOGY**

**Not to count for credit with GEOG205, GEOG206**

**Hours** 14 days field work in 2 or 7 day sessions for one semester (February, week before Semester I, Easter break).

**Examination** By report.
SECTION FIVE

GEOL311 IGNEOUS PETROLOGY

Prerequisite: GEOL212, GEOL214
Not to count for credit with GEOL213

6 Hours per week for one semester
Examination: One 3 hour paper, class assignments

Content
Geological evolution of selected igneous rocks; changes in igneous petrogenesis throughout time. Labrador study of present day environmental change. The relation of present day environmental processes and resultant changes to the longer, Quaternary record will be examined critically. Topics covered include an overview of the general characteristics of the Pleistocene and Holocene, oceanic and terrestrial palaeoclimatic records, the fossil record and Neogene-Pleistocene faunal extinctions, Quaternary dating methods, sea-level change and coastal evolution, glaciation, unravel, analysis of Quaternary sediments, stratigraphic nomenclature and the archaeological record.

Texts: Consult lecturers concerned.

GEOL312 METAMORPHIC PETROLOGY

Prerequisite: GEOL212
Not to count for credit with GEOL203, GEOL306

6 Hours per week for one semester
Examination: One 3 hour paper, class assignments

Content
Petrogenesis of metamorphic rocks; interpretation of textures of rocks formed during prograde metamorphism, ductile shearing and accretion-subduction; processes involved in the production of grain shapes, intergranular and intragranular features.

Texts

GEOL313 STRUCTURAL GEOLOGY AND GEOPHYSICS

Prerequisite: GEOL214
Not to count for credit with GEOL301, GEOL302

6 Hours per week for one semester
Examination: One 3 hour paper, class assignments

Content
Structural Geology
- Geometrical analysis of multiply-deformed terrains; ductile shear zones, kinematic indicators and analysis, strike slip faulting, thrust and extensional tectonics.
- Exploration Geophysics
- Geophysical techniques — their interpretation and application.

Texts

GEOL314 STRATIGRAPHIC METHODS

Prerequisite: GEOL213
Not to count for credit with GEOL304, GEOL305

6 Hours per week for one semester
Examination: One 3 hour paper, class assignments

Content
Stratigraphic Methods
- Stratigraphic nomenclature; biostratigraphic zones; factors in lithofacies stratigraphy; stratigraphic breaks; stratigraphic facies changes; catastrophic stratigraphy versus uniformitarianism; correlation; stratigraphic palaeontology. Types of stratigraphic maps and sections; numerical analysis of data strings; numerical map analysis.
- Micropalaeontology
- Microfossils; their morphology, stratigraphic dispersal and economic importance.
- Geochronology and World Stratigraphy
- Principles of age dating; regional geological patterns of selected provinces of the world.

GEOL316 GEOLOGY OF FUELS

Prerequisite: GEOL213
Not to count for credit with GEOL305

6 Hours per week for one semester
Examination: One 3 hour paper, class assignments

Content
Coal Geology
- Origin, distribution, classification and economic potential of coal.
- Petroleum Geology
- Origin, source, migration, entrapment and distribution of petroleum and gas; the exploration and exploitation techniques of its detection, evaluation and recovery.

Texts: Consult lecturers concerned.

GEOL317 RESOURCE AND EXPLORATION GEOLOGY

Prerequisites: GEOL212, GEOL214
Not to count for credit with GEOL301, GEOL306

6 Hours per week for one semester
Examination: One 3 hour paper, class assignments

Content
This course presents fundamental criteria for the identification of ore deposits and resultant changes to the longer, Quaternary record will be examined critically. Topics covered include an overview of the general characteristics of the Pleistocene and Holocene, oceanic and terrestrial palaeoclimatic records, the fossil record and Neogene-Pleistocene faunal extinctions, Quaternary dating methods, sea-level change and coastal evolution, glaciation, unravel, analysis of Quaternary sediments, stratigraphic nomenclature and the archaeological record.

Texts: Consult lecturers concerned.

GEOL318 GEOL318 GEOLOGY FIELD COURSE

5cp
Prerequisite: GEOL213
Hours 7 days fieldwork (February, week before Semester I)
Examination: By report

Content
A field course including core logging, section work, interpretation of data and basin analysis.

GEOL319 GEOLOGY FIELD COURSE

5cp
Prerequisites: GEOL216, GEOL313
Hours 10 days fieldwork (July break)
Examination: By report

Content
Structural analysis of a multiply-deformed structural/metamorphic terrain (Broken Hill Block). Evaluation of P-T-t histories in the terrain and integration with tectonic models.

Texts: Consult lecturers concerned.

GEOL320 GEOLOGY OF QUATERNARY ENVIRONMENTS

10cp
Prerequisites: GEOL213 or GEOG204
Hours 6 Hours per week for one semester
Examination: One 3 hour paper, class assignments

Content
This course will examine the historical basis for contemporary environmental change. The relation of present day environmental processes and resultant changes to the longer, Quaternary record will be examined critically. Topics covered include an overview of the general characteristics of the Pleistocene and Holocene, oceanic and terrestrial palaeoclimatic records, the fossil record and Neogene-Pleistocene faunal extinctions, Quaternary dating methods, sea-level change and coastal evolution, glaciation, unravel, analysis of Quaternary sediments, stratigraphic nomenclature and the archaeological record.

Texts: Consult lecturers concerned.
## Mathematics Subject Descriptions

### LEVEL 100 MATHEMATICS SEMESTER SUBJECTS

The usual route for study of Mathematics beyond first year—for example, to obtain a "Major in Mathematics" starts with MATH102 in first semester, followed by MATH103 in second semester. However, entry at this point requires an adequate level of knowledge and skill: The minimum level is a mark of at least 120 out of 150 in 3-unit Mathematics at the New South Wales H.S.C. examination.

Any student with less than this level of knowledge or skill has available MATH111, followed by MATH112. This combination allows entry to seven of the seventeen level-200 subjects in Mathematics. Such a student could take MATH103 in a later year to meet the prerequisites for further mathematics subjects.

Note that MATH111 is not appropriate for a student who has performed substantially above the minimum level for entry to MATH102/103.

### MATH111 MATHEMATICS 111 10cp

**Prerequisite:** 2U mathematics at HSC level or equivalent.

- **Not to count for credit with:** MATH101.
- **Hours:** 4 lecture Hours and 2 tutorial Hours per week for one semester.

**Examination:** One 2 hour paper.

**Content:**

- Elementary algebra, trigonometry and geometry with applications.
- Counting, probability, and an introduction to finite mathematical structures.

**Texts**

- University of Newcastle 1993, Tutorial Notes for MATH112.

**Reference**

- Ayres, F. 1974, Calculus Schaum.
- F. 1974, Calculus Schaum.

### MATH102 MATHEMATICS 102 10cp

**Prerequisite:** Either a performance of at least 120 out of 150 in 3U Mathematics at the NSW HSC or equivalent or MATH111.

- **Not to count for credit with:** MATH112.
- **Hours:** 4 lecture Hours and 2 tutorial Hours per week for one semester.

**Examination:** One 3 hour paper.

**Content:**


**Texts**

- University of Newcastle 1993, Tutorial Notes for MATH102.

### MATH201 MULTIVARIABLE CALCULUS 5cp

**Prerequisite:** Both MATH111 and MATH112, or both MATH102 and MATH103, or MATH102 and Permission of Head of Department.

- **Hours:** 2 hours per week for one semester.

**Examination:** One 2 hour paper.

**Content:**

- Partial derivatives, Vector operators, Taylor's Theorem, Line integrals, Multiple and surface integrals, Gauss, Green, Stokes' Theorems.

**Text:**

- University of Newcastle 1993, Mathematics II Tutorial Notes.

### MATH202 ORDINARY DIFFERENTIAL EQUATIONS 5cp

**Prerequisite:** Both MATH111 and MATH112 or both MATH102 and MATH103, or MATH102 and Permission of Head of Department.

- **Hours:** 2 hours per week for one semester.

**Examination:** One 2 hour paper.

**Content:**


**Texts**

- University of Newcastle 1993, Mathematics II Tutorial Notes.
MATH205 ANALYSIS OF METRIC SPACES 5cp
Prerequisite MATH204.
Hours 2 Hours per week for one semester.
Examination One 2 hour paper.
Content
Study in an axiomatic way of the analysis of more abstract spaces: metric and normed linear spaces.
Convergence of sequences and series in Rn with Euclidean and other norms.
Convergence of sequences and series in function spaces with uniform and integral norms, the three fundamental theorems on uniform convergence involving continuity, integration and differentiation and application to power series.
Completeness, closedness and density in metric spaces; Banach Fixed Point Theorem and its application to functions on the real line and to the solution of integral equations.
Local and global continuity of mappings on metric spaces and topological characterizations.
Sequential compactness and application in approximation theory.
Test
Gilles, J.R. 1989, Introduction to the Analysis of Metric Spaces CUP.

References
Steele, K.G. 1985, Mathematical Analysis CUP.
Spivak, M. 1967, Calculus Benjamin.

MATH206 COMPLEX ANALYSIS I 5cp
Prerequisite Both MATH111 and MATH112 or both MATH102 and MATH103, or MATH102 and MATH103 and permission of the Head of Department.
Corequisite MATH201.
Hours 2 Hours per week for one semester.
Examination One 2 hour paper.
Content
Complex numbers, Cartesian and polar forms, geometry of the complex plane, solutions of polynomial equations: Complex functions, mapping theory, limits and continuity. Differentiation, the Cauchy-Riemann Theorem. Elementary functions, exponential, logarithmic, trigonometric and hyperbolic functions. Integration, the Cauchy-Goursat Theorem. Cauchy’s integral formula, Liouville’s Theorem and the Fundamental Theorem of Algebra.
Test

References

MATH207 COMPLEX ANALYSIS 2 5cp
Prerequisite MATH206 and MATH103.
Hours 2 Hours per week for one semester.
Examination One 2 hour paper.
Content
Taylor and Laurent series, analytic continuation. Residue theory, evaluation of some real integrals and series, the Argument Principle and Rouche’s Theorem. Conformal mapping and applications. Further examination of multivalued functions; branch cuts, Riemann surfaces.
Test

References

MATH210 GEOMETRY 1 5cp
Prerequisite (MATH102 and MATH103) or (MATH111 and MATH112 and MATH103).
Hours 2 Hours per week for one semester.
Examination One 2 hour paper.
Content
A classical approach to geometry, touching Euclidean plane geometry, hyperbolic plane geometry, projective geometry, and their relationships to one another.
Test
Notes for Geometry, Mathematics Department, 1993.

References

MATH211 GROUP THEORY 5cp
Prerequisite (MATH102 and MATH103) or (MATH111 and MATH112 and MATH103).
Hours 2 Hours per week for one semester.
Examination One 2 hour paper.
Content
Groups, subgroups, homomorphism. Permutation groups, groups of linear transformations and matrices, isometries, symmetry groups of regular polygons and polyhedra. Coats, Lagnagor’s theorem, normal subgroups, isomorphism theorems.
Test

References
Budden, P.J. 1972, The Fascination of Groups, Cl.

MATH212 DISCRETE MATHEMATICS 5cp
Prerequisites MATH102 or MATH103 or (MATH111 and MATH112).
Hours 2 Hours per week for one semester.
Examination One 2 hour paper.
Content
An introduction to various aspects of discrete mathematics: Graphs, set theory, relations and functions, logic, counting and recurrence equations.

References
Hochstadt, H., Differential Equations Dover.
Martin, W.T. & Reinsner, Elementary Differential Equations Dover.

MATH204 REAL ANALYSIS 5cp
Prerequisite (MATH102 and MATH103) or (MATH111 and MATH112 and MATH103).
Hours 2 Hours per week for one semester.
Examination One 2 hour paper.
Content
Study in an axiomatic way of the properties of the real number system and functions defined on the real numbers and on the Euclidean plane.
Properties of the real number system: the Supremum Axiom, completeness and compactness.
Convergence of sequences and series in the Euclidean plane.
Limits of functions and algebras of limits, continuity and algebra of continuous functions.
Properties of continuous functions: connectedness, compactness and uniform continuity.
Properties of differentiable functions: Mean Value Theorems and Taylor polynomial approximation for functions on the real numbers and on the Euclidean plane.
The theory of Riemann integration for functions on the real numbers, the study of class of integrable functions.
The Fundamental Theorem of Calculus for functions on the real numbers relating differential and integral calculus.

Test
Gilles, J.R. Real Analysis: an introductory course Lecture Notes in Mathematics, Univ Newcastle, No.6.

References
Simonds, K.G. 1985, Mathematical Analysis CUP.
Spivak, M. 1961, Calculus Benjamin.
MATH213 MATHEMATICAL MODELLING 5cp

**Prerequisites** (MATH002 and MATH003) or (MATH111 and MATH112).

**Hours** 2 Hours per week for one semester.

**Examination** One 2 hour paper.

**Content**

This topic is designed to introduce students to the idea of a mathematical model. Several realistic situations will be treated beginning with an analysis of the non-mathematical origin of the problem, the formulation of the mathematical model, solution of the mathematical problem and interpretation of the theoretical results. The use of computers is an integral part of this subject.

**References**


MATH215 OPERATIONS RESEARCH 5cp

**Prerequisites** MATH002 or MATH003 or (MATH111 and MATH112).

**Hours** 2 Hours per week for one semester.

**Examination** One 2 hour paper.

**Content**

Operations research involves the application of quantitative methods and tools to the analysis of problems involving the operation of systems and its aim is to evaluate the consequences of certain decision choices and to improve the effectiveness of the system as a whole.

This subject will cover a number of areas of operations research which have proved successful in business, economics and defence. These include such topics as network analysis and linear programming.

**References**


MATH216 NUMERICAL ANALYSIS 5cp

**Prerequisites** (MATH102 and MATH103) or (MATH111 and MATH112) and (MATH201 and MATH202 and MATH203) and (MATH204).

**Hours** 3 Hours per week for one semester.

**Examination** One 2 hour paper.

**Content**

Numerical analysis involves the study of numerical methods for solving mathematical problems. These methods are used in a wide variety of applications, ranging from numerical linear algebra to the solution of differential equations.

**References**


MATH217 LINEAR ALGEBRA 5cp

**Prerequisite** MATH102 or (MATH111 and MATH112).

**Hours** 2 Hours per week for one semester.

**Examination** One 2 hour paper.

**Content**

Linear algebra is a fundamental area of mathematics that deals with the study of vector spaces and linear transformations. It has applications in many fields, including computer science, physics, and engineering.

**References**


MATH218 LINEAR ALGEBRA 2 5cp

**Prerequisite** MATH102 or (MATH111 and MATH112).

**Hours** 3 Hours per week for one semester.

**Examination** One 2 hour paper.

**Content**

This course continues the study of linear algebra, building on the concepts covered in MATH217. It covers topics such as eigenvalues, eigenvectors, and diagonalization.

**References**

- Halmos, P.R. 1974, Finite Dimensional Vector Spaces, Van Nostrand.

MATH219 PARTIAL DIFFERENTIAL EQUATIONS 2 10cp

**Prerequisites** MATH201, MATH202, MATH203 and MATH204.

**Hours** 3 Hours per week for one semester.

**Examination** One 2 hour paper.

**Content**

Partial differential equations are equations involving partial derivatives of a function of several variables. They arise in many areas of science and engineering, and are a fundamental tool for modeling physical phenomena.
SECTION IV

MATH206 FLUID MECHANICS

10cp

Prerequisites: MATH201, MATH203, MATH204 and MATH206.

Advisory Pre/Corequisite: MATH207.

Hours 3 Hours per week for one semester.

Examination: One 2 hour paper.

Content

(An essay: see note at the end of the listing for 300 level subjects).

Basic concepts: continuum, pressure, viscosity. Derivation of the equations; the case of irrotational flow; Kelvin's circulation theorem. Re-motion equations; the case of irrotational flow; Kelvin's circulation theorem. Re-motion equations. Investigation of simple irrotational inviscid flows; 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 inviscid.

References


Fong, P. 1985, Elementary Quantum Mechanics Addison-Wesley.

Huang, K. 1960, Statistical Mechanics, Wiley.


MATH201 GEOMETRY 2

10cp

Prerequisites: 20 credit points from 200 level Mathematics, including at least one of MATH209, 211, 218.

3 Hours 3 Hours per week for one semester.

Examination: One 2 hour paper.

Content

(An essay: see note at the end of the listing for 300 level subjects).


References


Fong, P. 1985, Elementary Quantum Mechanics Addison-Wesley.

Huang, K. 1960, Statistical Mechanics, Wiley.


MATH309 COMBINATORICS

10cp

Not offered in 1993.

MATH310 FUNCTIONAL ANALYSIS

10cp

Prerequisites: MATH205.

Hours 1 1/2 hours per week for full year

Examination: One 2 hour paper.

Content

(An essay: see note at the end of the listing for 300 level subjects).

Normed linear spaces, finite dimensional spaces, inner product spaces. Linear mappings, continuity, topological and isometric isomorphisms. Dual spaces, the Hahn–Banach Theorem and reflexivity. Conjugate mappings, operators on Hilbert space, adjoint operators and projection operators.

References


Jameson, G.J.O. 1974, Topology and Normed Spaces, Chapman & Hall.


Young, N. 1988, An introduction to Hilbert space, CUP.

MATH311 MEASURE THEORY & INTEGRATION

10cp

Not offered in 1993.

MATH312 ALGEBRA

10cp

Prerequisites: MATH218 and at least one of MATH209, MATH210 or MATH211.

Examination: One 2 hour paper.

Content

(An essay: see note at the end of the listing for 300 level subjects).

In this topic the solution of polynomial equations and their relationships with classical geometrical problems such as duplication of the cube and trisection of angles will be studied. It will further examine the relations between the roots and coefficients of equations, relations which gave rise to Galois theory and the theory of extension fields. Why equations of degree 5 and higher cannot be solved by radicals will be investigated.

References


Cox, S.D. & de Boor, C. 1980, Elementary Numerical Analysis,
### MATH315 Mathematical Biology

**10cp**

**Prerequisites:** MATH201, MATH203 and MATH213.

**Hours:** 3 Hours per week for one semester.

**Examination:** One 2 hour paper.

**Content**

(An essay: see note at the end of the listing for 300 level subjects)

Many situations in Economics, Engineering, Experimental and Pure Science are reducible to questions of Optimization. The course is introduced by considering some simple examples of this. The basic analysis and theory of convex sets and convex functions underlying optimization are then developed. The theory of linear programming, including Bland's anti-cycling rule and duality, is examined. Constrained nonlinear optimization in both the convex and the smooth case are developed from a common separation argument. Ekeland's variational principle, expected to use both analytical and computational techniques to obtain results which can be compared with experimental findings.

**References:**

### MATH316 Industrial Modelling

**10cp**

**Not offered in 1993.**

**MATH317 Number Theory**

**10cp**

Not offered in 1993.

**MATH318 Topology**

**10cp**

**Prerequisites:** MATH204 or MATH205.

**Hours:** 3 Hours per week in one semester.

**Examination:** One 2 hour paper.

(An essay: see note at the end of the listing for 300 level subjects)

General topology: continuous functions and open sets; topologies and topological spaces; compactness, connectedness and separation properties; product spaces. Introduction to algebraic topology: homotopies, covering spaces and the fundamental group.

**References:**

### MATH319 Computational Mathematics

**10cp**

**Prerequisites:** MATH201, MATH203 and MATH213.

**Hours:** 3 Hours per week for one semester.

**Examination:** One 2 hour paper.

(An essay: see note at the end of the listing for 300 level subjects)

The subject addresses the application of numerical, symbolic and algebraic techniques to decision making and optimisation in a business setting. Topics include aspects of forecasting, machine scheduling, linear programming, decision theory, networks, critical path method and inventory control. Use will be made of appropriate computer packages.

**References:**

### MATH320 Mathematics and Biology

**10cp**

**Prerequisites:** MATH201 and MATH218.

**Hours:** 3 Hours per week for one semester.

**Examination:** Progressive assessment based on tutorials and assignments plus a 2 hour final examination.

(An essay: see note at the end of the listing for 300 level subjects)

The subject addresses the application of numerical, symbolic and algebraic techniques to decision making and optimisation in a business setting. Topics include aspects of forecasting, machine scheduling, linear programming, decision theory, networks, critical path method and inventory control. Use will be made of appropriate computer packages.

**References:**

### MATH321 Mathematics and Economics

**10cp**

**Prerequisites:** MATH201 and MATH218.

**Hours:** 3 Hours per week for one semester.

**Examination:** Progressive assessment based on tutorials and assignments plus a 2 hour final examination.

(An essay: see note at the end of the listing for 300 level subjects)

The subject addresses the application of numerical, symbolic and algebraic techniques to decision making and optimisation in a business setting. Topics include aspects of forecasting, machine scheduling, linear programming, decision theory, networks, critical path method and inventory control. Use will be made of appropriate computer packages.

**References:**
variables, Cauchy’s theorem, power and Laurent series, singularities, residues and poles, conformal mappings.

Linear Algebra, inner product spaces, eigenvalues, diagonalization of a quadratic form and a variety of applications. Ordinary differential equations of the first degree. Solution by series. The methods of Frobenius, Bessel and Legendre.

MAQM36 MATHEMATICS IIIA (MA336Q) 15cp

Hours 3 Hours per week for a year.

Content
Sets and classes of sets, sigma rings and sigma algebras construction of the rationals and reals. An introduction to mathematical logic. Elementary group theory. Transformation geometry and non-eeuclidean geometry.

MAQM37 MATHEMATICS IIIB (MA337Q) 15cp

Hours 3 Hours per week for a year.

Content
Probability distributions, sampling distributions, hypothesis testing. Topics in operations research including project scheduling, job sequencing, queuing theory, dynamic programming and decision theory. Computer applications to the above topics and to development in computer aided learning.

MAQM43 MATHEMATICS IVA (MA435Q) 10cp

Available only to Bachelor of Education students.

Hours 2 Hours per week for a year.

Content
Combinatorics, block designs, finite geometries, Latin squares, magic squares and Hadamard matrices. Groups, rings, ideals, integral domains and fields.

MAQM46 MATHEMATICS IVB (MA436Q) 10cp

Available only to Bachelor of Education students.

Hours 2 Hours per week for a year.

Content
Number theory, prime numbers, congruences, Diophantine equations, Gaussian integers. The historical development of mathematics - selected topics.

MAQM47 MATHEMATICS IVC (MA437Q) 10cp

Available only to Bachelor of Education students.

Hours 2 Hours per week for a year.

Content
Numerical Analysis, solution of systems of equations, numerical differentiation and integration, application to ordinary differential equations. Microcomputing using package software and programming to solve course-related problems.

B.Ed (Primary Education)

MAQM146 FOUNDATION STUDIES IN (PR136Q) ELEMENTARY MATHEMATICS 15cp

Available only to Bachelor of Education students.

Hours 3 Hours per week for a year.

Content
This subject provides a background of mathematical content and skills needed by teachers of elementary mathematics. The content covers sets, elementary number theory, geometry, measurement and probability.

B.Ed (Early Childhood)

MAQM147 MATHEMATICS IEC (RC130Q) 10cp

Available only to Bachelor of Education students.

Hours 4 Hours per week for one semester.

Content
This subject provides a background of mathematical content and skills needed by teachers in the Early Childhood field. Topics include a study of elementary set theory, natural numbers into gens and rational numbers, non decimal systems, number patterns, elementary geometry, measurement and probability.

PHYS101 PHYSICS 101 10cp

Assumed Knowledge HSC 2 unit Mathematics with a result in the top 30% of the candidates or equivalent.

Hours 6 Hours per week for one semester.

Content
Progressive assessment during the semester and one three hour paper at the end of the semester.

This is an introductory course in physics concentrating primarily on the core topics of classical physics. The lecture course consists of three main strands:

1. Mechanics
2. Electromagnetism
3. Waves, optics and thermal physics.

There will also be 3 hrs/week of laboratory and tutorial work.

Text

Reference

PHYS102 PHYSICS 102 10cp

Prerequisites PHYS101 or Assumed knowledge of HSC 2 unit Physics or 4 unit Science (with a result in the top 50% of the candidates) and HSC3 unit Mathematics (with a mark of at least 60/100) or MATH111.

Hours 6 Hours per week for one semester.

Examination Progressive assessment during the semester and one 3 hour paper at the end of the semester.

Content
A unifying theme of the lecture course will be 'The Earth in the Universe.' The following topics will be studied:

Gravity and satellite motion; cosmology; nuclear physics and its applications; heat and heat engines; the Earth as a heat engine; atomic physics, optical instruments, electronic devices, radiation detection and safety.

There will also be 3 Hours per week associated with laboratory and tutorial work.

Text

References
Study guide to accompany above text.

PHYS103 PHYSICS 103 10cp

Prerequisite PHYS102.

PHYS201 QUANTUM MECHANICS AND ELECTROMAGNETISM 10cp

Prerequisites
Recommended entry is from PHYS103 and MATH103, but performance to acceptable standard in PHYS101 and PHYS102 may substitute for PHYS103, and/or MATH111 and MATH112 may substitute for MATH103, with approval of the Head of Department.

Hours 6 Hours per week for one semester.

Examination Progressive assessment during the semester, and one 2 hour paper at end of semester.

Content
Basic principles of modern quantum mechanics, and electromagnetic theory. Laboratory, computational and tutorial work in these areas.

Texts
See the Physics 200 Notice Board.

References
To be advised.

PHYS202 MECHANICS AND THERMAL PHYSICS 10cp

Prerequisites
MATH112 and PHYS103 or PHYS101 and PHYS102 with credits or better and the approval of the Head of Department.

Hours 6 Hours per week for one semester.

Examination Progressive assessment during the semester and one 2 hour paper at end of semester.

Content
Thermal physics, advanced classical mechanics and an introduction to relativity theory.

Texts
See the Physics 200 Notice Board.

References
To be advised.

PHYS203 SOLID STATE AND ATOMIC PHYSICS 10cp

Prerequisite PHYS201.
PHYS205 SCIENTIFIC MEASUREMENT PRINCIPLES, PROCESSES AND APPLICATIONS 10cp

**Prerequisite:** PHYS102.

**Hours:** Up to 6 Hours per week for one semester.

**Examination:** Progressive assessment during semester and one 2 hour paper at end of semester.

**Content:** Introductory course in analog and digital instrumentation, signal processing principles and computer applications. Emphasis will be on laboratory and environmental applications. This subject is recommended for students in all areas of science wishing to gain an understanding of the principles and applications of basic electronic instrumentation and computer techniques.

**Tests:** See the Physics 200 Notice Board.

**References:** To be advised.

PHYS301 MATHEMATICAL METHODS AND QUANTUM MECHANICS 10cp

**Prerequisites:** PHYS201, MATH201 and MATH203.

**Hours:** 2 lectures and 4 hours laboratory/tutorial per week for one semester.

**Examination:** Examination(s) and assessment equivalent to 3 Hours examination.

**Content:** Mathematical methods. Quantum mechanics.

**Tests and References:** Refer to the Physics 300 Notice Board. Students should retain their Physics 200 texts.

PHYS302 ELECTROMAGNETISM AND ELECTRONICS 10cp

**Prerequisites:** PHYS201 and MATH201.

**Hours:** 2 lectures and 4 hours laboratory/tutorial per week for one semester.

**Examination:** Examination(s) and assessment equivalent to 3 Hours examination.

**Content:** Electromagnetism. Electronics.

**Tests and References:** Refer to the Physics 300 Notice Board. Students should retain their Physics 200 texts.

PHYS303 ATOMIC, MOLECULAR AND SOLID STATE PHYSICS 10cp

**Prerequisites:** PHYS203 and PHYS301.

**Hours:** 2 lectures and 4 Hours laboratory/tutorial per week for one semester.

**Examination:** Examination(s) and assessment equivalent to 3 Hours examination.

**Content:** Atomic and molecular physics. Solid state physics.

**Tests and References:** Refer to the Physics 300 notice board. Students should retain their Physics 200 texts.

PHYS304 STATISTICAL PHYSICS AND RELATIVITY 10cp

**Prerequisites:** PHYS202 and MATH201.

**Hours:** 2 lectures and 4 Hours laboratory/tutorial per week for one semester.

**Examination:** Examination(s) and assessment equivalent to 3 Hours examination.

**Content:** Statistical physics. Relativity.

**Tests and References:** Refer to the Physics 300 notice board. Students should retain their Physics 200 texts.

PHYS305 NUCLEAR PHYSICS AND ADVANCED ELECTROMAGNETISM 10cp

**Prerequisite:** PHYS302.

**Hours:** 2 lectures and 4 Hours laboratory/tutorial per week for one semester.

**Examination:** Examination(s) and assessment equivalent to 3 Hours examination.

**Content:** Nuclear physics. Advanced Electromagnetism.

**Tests and References:** Refer to the Physics 300 Notice Board. Students should retain their Physics 200 texts.

PSYC101 PSYCHOLOGY INTRODUCTION I 10cp

**Hours:** 5 hours per week for one semester (3 hours per week lectures, 2 hours per week laboratory).

**Examination:** One 2 hour paper.

**Content:** Three written reports. Laboratory work. Introductory Methodology and Statistics, Biological Foundations, Perception and Learning.

**Tests:** General.


PSYC102 PSYCHOLOGY INTRODUCTION II 10cp

**Prerequisite:** PSYC101

**Hours:** 5 hours per week for one semester (3 hours per week lectures, 2 hours per week laboratory).

**Examination:** One 2 hour paper.

**Content:** Three written reports. Laboratory work. Development, Cognition, Social Psychology.

**Tests:** General.


PSYC201 FOUNDATIONS FOR PSYCHOLOGY 10cp

**Prerequisite:** PSYC102

**Hours:** 2 hours lectures per week for one semester together with laboratory work.

**Examination:** Students will be assessed by continuous assessment throughout the semester.

**Content:**

(a) A selection of topics in experimental design, parametric tests, introduction to analysis variance and related topics, and formerly may be considered.

(b) A laboratory component which will mainly deal with neuroanatomy.

**Tests to be advised.**

**References:** To be advised.

PSYC202 BASIC PROCESSES 10cp

**Prerequisite:** PSYC102

**Corequisite:** PSYC201

**Hours:** 2 hours lectures per week for one semester together with laboratory work.

**Examination:** One 2 hour exam paper plus laboratory exercises.

**Content:** This subject will examine basic processes in Psychology such as perception, cognition, and learning. Both animal and human models may be considered.

**Tests:**

Goldstein, E.B. 1984, Sensation & perception., Belmont Cal.

**References:**


PSYC203 DEVELOPMENTAL AND SOCIAL PROCESSES 10cp

**Prerequisite:** PSYC102

**Corequisite:** PSYC201

**Hours:** 2 hours per week for one semester together with laboratory work.

**Examination:** One 2 hour exam paper plus laboratory exercises.
Students are encouraged to read widely in any chapters on abnormal behaviour in post 1987 texts.

**PSYC301 ADVANCED FOUNDATIONS FOR PSYCHOLOGY**

**Prerequisites** PSYC201, PSYC202 and PSYC203

**Hours** 4 hours per week for one semester.

**Examination** One 3 hour exam paper.

**Content**

This course consists of the following topics:

(a) Experimental design principles in psychology ranging from naturalistic observation to experimental and quasi-experimental designs, including single-case studies.

(b) Practical computation techniques for the analysis of experimental designs in psychological research, using MINITAB, BMDP and SPSS/IX.

(c) Introduction to multivariate statistical techniques such as Multiple Linear Regression, Discriminant Analysis and Cluster Analysis.

(d) The Mill laboratory programs will be used to collect data in the tutorial periods.

**References**


**PSYC302 INDEPENDENT PROJECT**

**Prerequisite** PSYC201

**Corequisite** PSYC301

**Hours** 2 hours per week for the full year.

**Examination** Submission of a written report containing introduction, methods, results and discussion not more than thirty pages in length due early October.

**Content**

The project consists of an experiment or series of experiments, surveys or tests designed to explore a hypothesis. Each student will be supervised by an academic staff member of the Department of Psychology. The list of research areas will be available at the beginning of the academic year. Students are advised that this subject is a prerequisite for entry into an Honours year in Psychology.

**References**


A series of readings will also be recommended as the course progresses.

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**PSYC304 INDIVIDUAL PROCESSES**

**Prerequisite** PSYC201

**Corequisite** PSYC301

**Hours** 2 hours per week for one semester.

**Examination** One 2 hour exam paper and an analytical report.

**Content**

This subject will extend the examination of basic processes in psychological research, using experimental designs in psychological research, using Minitab, BMDP and SPSS/IX. An introduction to multivariate statistical techniques such as Multiple Linear Regression, Discriminant Analysis and Cluster Analysis. The Mill laboratory programs will be used to collect data in the tutorial periods.

**References**


**PSYC305 INDIVIDUAL PROCESSES**

**Prerequisite** PSYC201

**Corequisite** PSYC301

**Hours** 2 hours per week for one semester.

**Examination** One 2 hour exam paper and an analytical report.

**Content**

This subject will extend the examination of basic processes covered in PSYC303. The subject will be complemented by a series of readings recommended as the course progresses.

**References**


A series of readings will also be recommended as the course progresses.

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**References**

Students are expected to read a wide range of current literature in the area chosen for the research project.

**PSYC303 BASIC PROCESSES 1**

**Prerequisite** PSYC201

**Corequisite** PSYC301

**Hours** 4 hours per week for one semester.

**Examination** One 2 hour exam paper and a laboratory report.

**Content**

This subject will examine basic processes in Psychology such as perception, cognition, memory and learning and the effects of early experience. Topics not covered in this subject will be dealt with in PSYC304. Both animal and human models will be considered. The subject will be complemented by a laboratory program which will run over 4-5 weeks.

**References**


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**PSYC306 ADVANCED SOCIAL PROCESSES 1**

**Prerequisite** PSYC201

**Corequisite** PSYC301

**Hours** 4 hours per week for one semester.

**Examination** By a combination of formal examination and practical workshop assignments.

**Content**

This unit uses the topic of motivation to provide an integration of a wide range of social psychological models and research in psychology, and to put the subject into the context of philosophical and theoretical development generally. A number of motivational models are studied (biological, learned behaviour, cognition and social ecology) and applied to work and clinical problems. Problem based workshops will be integrated with the lectures and regular assignments will be based on these workshops.

**References** Readings and references will be available during the course.

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**PSYC307 ADVANCED APPLIED TOPICS IN PSYCHOLOGY**

**Prerequisite** PSYC201

**Corequisite** PSYC301

**Hours** 4 hours per week for one semester.

**Examination** One 2 hour exam paper plus hurdle requirements.

**Content**

This unit will examine the theory underlying psychological test construction, and will introduce a range of psychological tests through practical seminars in which training will be given in test administration and interpretation. The underlying basis of interviewing as an assessment technique will also be studied and training will be given in interviewing techniques.

**References**


Keats. Skilled interviewing. ACER.
References

Texts
Basic data structures and algorithms are investigated. Topics covered will include elementary data structures, abstract data types, hashing, search trees, heaps, and sorting. If time permits, more advanced topics in analysis of algorithms will also be covered.

Content
Each student will be supervised by a member of the Psychology Department. Students are strongly advised to discuss potential projects with appropriate staff members well in advance. The placement component involves introductory seminars in ethical and professional issues, supervised experience in a community facility in the Newcastle area, and the submission of an essay relating the practical activities to psychological theory and technique.

Texts and References
To be advised.

PSYC402 PSYCHOLOGY HONOURS 402 (THESIS) 40cp
Prerequisite A completed BA or BSc, or three complete years of a BA (Psych) or BSc (Psych) including the subjects PSYC101 and PSYC102, and at least 40 credit points of Psychology at the 200 level including PSYC201, and at least 60 credit points of Psychology at the 300 level including PSYC301 and PSYC302. Candidates must have obtained at least a Credit grade or better in each of four 300 level Psychology subjects including PSYC301 and PSYC302.
Corequisite PSYC401
Hours 12 hours per week for the full year
Examination Thesis will be assessed independently by two members of the Department other than the Supervisor.
Content PSYC402 comprises half of the final Honours in Psychology. Full-time students enrol in PSYC402 as well. Part-time students complete PSYC401 in the first year and PSYC402 in the second. PSYC402 consists of the development, conduct, analysis, and reporting of a piece of original empirical research. The thesis is a formal presentation of the research and must be in APA format. There is a limit of fifty pages. Each student will be supervised by a member of the Psychology Department. Students are strongly advised to discuss potential projects with appropriate staff members well in advance. The placement component involves introductory seminars in ethical and professional issues, supervised experience in a community facility in the Newcastle area, and the submission of an essay relating the practical activities to psychological theory and technique.

Texts and References
To be advised.

PSYC403 PSYCHOLOGY 403 30cp
Prerequisite Candidates must be enrolled for the BA (Psych) or BSc (Psych) and must have completed the equivalent of three full time years of the degree, including passes or above in the subjects PSYC101 and PSYC102, at least 40 credit points of Psychology at the 200 level including PSYC201, and at least 60 credit points of Psychology at the 300 level including PSYC301.
Corequisite PSYC401
Hours 8 hours per week for the full year
Examination To be advised
Content PSYC403 comprises one third of the final year of the BA (Psych) or BSc (Psych). Full-time students are expected to enrol in PSYC404 as well. Part-time students complete PSYC403 in the first year and PSYC404 in the second. PSYC404 consists of three seminar series, including one compulsory unit on theoretical issues in psychology, and a choice of two optional units. Each unit will include seminars at which attendance and participation is compulsory, and will be assessed by essay, examination, oral presentation, or a combination. The exact topics of the seminars vary from year to year depending on staff availability. There is some overlap with PSYC401.

Texts and References
To be advised.

PSYC404 PSYCHOLOGY 404 50cp
Prerequisite Candidates must be enrolled for the BA (Psych) or BSc (Psych) and must have completed the equivalent of three full time years of the degree, including passes or above in the subjects PSYC101 and PSYC102, at least 40 credit points of Psychology at the 200 level including PSYC201, and at least 60 credit points of Psychology at the 300 level including PSYC301.
Corequisite PSYC403
Hours 16 hours per week for the full year
Examination Reports will be assessed by two or more members of the Department. Placement will be assessed on the basis of supervisor’s report and a student essay.
Content PSYC404 comprises two-thirds of the final year of the BA (Psych) or BSc (Psych). Full-time students are expected to enrol in PSYC402 as well. Part-time students complete PSYC401 in the first year and PSYC404 in the second. PSYC404 consists of two equally-weighted sections a piece of original empirical research, and a placement. The research project will be supervised by a member of the Psychology Department and must be in an applied area. A report in APA format, of approximately twenty five pages, is required. Candidates are strongly advised to discuss potential projects with appropriate staff members well in advance. The placement component involves introductory seminars in ethical and professional issues, supervised experience in a community facility in the Newcastle area, and the submission of an essay relating the practical activities to psychological theory and technique.

Texts and References
To be advised.

COMP201 ADVANCED DATA STRUCTURES 5cp
Basic data structures and algorithms are investigated. Topics covered will include elementary data structures, abstract data types, hashing, search trees, heaps, and sorting. If time permits, more advanced topics in analysis of algorithms will also be covered.

COMP202 COMPUTER ARCHITECTURE 5cp
This subject covers the fundamental principles of computer system organisation and architecture. Topics covered will include instruction set design, CPU components, microprogramming, memory hierarchy, memory management, I/O, concurrency and pipelining and an introduction to parallel architectures. Selection of architecture case studies will also be discussed.

COMP203 ASSEMBLY LANGUAGE 5cp
The course is divided into two sections. The first section provides an introduction to computer organisation and assembly language programming. Topics covered include data representation, computer structures, registers, addressing modes, instruction sets, subroutines and the use of stacks. The second section of the course is an introduction to operating system principles. Topics covered include process management, synchronisation and resource allocation.

COMP204 PROGRAMMING LANGUAGE SEMANTICS 5cp
Examination of the major concepts which underlie modern programming languages. A variety of programming styles will be compared, including imperative, object-oriented, functional, and logic programming. Representative languages will be introduced to illustrate the concepts behind each style. Programming design issues such as data encapsulation, information hiding, and inheritance will also be studied. Languages studied chosen from C, C++, Lisp, Modula-2, Pascal, Prolog, Scheme, Smalltalk, Ada.

COMP205 SYSTEM PROGRAMMING 5cp
Systems programming for those already proficient in Pascal. Elementary Unix system calls and interfaces to other languages such as Pascal and Assembly Language. Use of UNIX software system tools such as "make," "lint" and "indent."
COMP026 THEORY OF COMPUTATION 5cp
An introduction to theoretical computer science, covering material in the areas of formal languages, automata theory and computability.

COMP121 INTRODUCTION TO PROGRAMMING 5cp
This subject is not available to candidates for the Bachelor of Computer Science degree, or to students who have passed or been exempted from COMP101.

An introduction to structured programming and the design of algorithms using a procedural language.

COMP241 COGNITIVE SCIENCE 10cp
An interdisciplinary approach to the examination of models and metaphors of mind, language, knowledge and perception used by various disciplines and the potential applications of those models and metaphors by artificial intelligence researchers, computer scientists and engineers.

COMP299 PROJECT 5cp
A project in computer science for students enrolled in the Diploma of Computer Science program.

COMP301 COMPILER DESIGN 10cp
Introduction to the theory of grammars, lexical analysers, parsing techniques, object code generation, Global and posthole optimisation. Runtime support, error management. Scanner and parser generators.

COMP302 ARTIFICIAL INTELLIGENCE 10cp
An introductory overview to Artificial Intelligence, covering some or all of the following topics: history of AI, game playing, knowledge representation, search techniques, natural language processing, expert systems, automatic deduction, theorem proving, computer vision, computer learning, philosophical, psychological, and social issues.

COMP303 COMPUTER NETWORKS 10cp
An introduction to data communication networks. Topics include data transmission, transmission media, network protocols, ISO, OSI, public data networks, local area networks and distributed systems.

COMP304 DATABASE DESIGN 10cp
A basic introduction to database systems, with particular emphasis on relational database systems. Topics covered will include: basic concepts and terminology, types of systems (hierarchical, relational, network, inverted list), data design, relational theory, relational algebra, relational calculus, data integrity/recovery, security, concurrency, distributed systems.

COMP305 ALGORITHM DESIGN AND ANALYSIS 10cp
Important methods of algorithm design are covered in this subject, including the divide-and-conquer paradigm, dynamic programming and greedy algorithms. The analysis of the performance and the correctness of algorithms is emphasised. Fundamental graph algorithms are also studied, including minimum spanning trees, and shortest paths. A selection of topics from algorithms for parallel computers, computational geometry, string matching and sorting networks are also covered, as time permits.

COMP306 COMPUTER GRAPHICS 10cp
This subject will cover advanced computer graphics topics with relevant mathematical and programming techniques and an overview of graphics hardware design. Topics include: geometrical transformations; 3D modelling and object hierarchy; standards - GKS, PHIGS, raster algorithms; anti-aliasing; region filling; curves and patches, hidden surface removal algorithms; shading and texture mapping; diffuse and specular reflection; colour modelling; growth models; fractals and particle systems; animation techniques; graphics hardware architectures.

COMP307 SOFTWARE ENGINEERING PRINCIPLES 10cp
The subject comprises lectures in first semester plus a major assignment in second semester. After a brief explanation of the nature and life-style of large software systems, the software crisis which they have created, and the desirable properties of well-designed systems, the lectures explore the nature of stable systems in the natural world and in engineering and consider how humans think about, remember and create complex systems. This leads to the re-evaluation of the principles and techniques used in the construction of major software systems, offering new insights into the concepts of modularity and hierarchical structure.

COMP308 OPERATING SYSTEMS 10cp
An introduction to operating system structure and design. Topics include: advanced synchronisation techniques, deadlock detection, memory management including virtual storage techniques, multiprocessor and file systems. The emphasis will be on practical operating systems, and where possible reference will be made to existing systems currently in use.

COMP309 SPECIAL TOPIC 1 10cp
A topic of contemporary relevance in computer science.
### STATISTICS SUBJECT DESCRIPTIONS

#### STAT101 INTRODUCTORY STATISTICS 10cp

**Not to count for credit with STAT103.**

**Prerequisites:** This course does not assume knowledge of calculus or matrix algebra.

**Hours:** 3 lecture hours, 1 laboratory hour and 1 tutorial hour per week. The course is offered in Semesters 1 and 2.

**Purpose:** To introduce students to the principles of study design, data analysis and interpretation; the statistical computing program MINITAB will be used extensively.

**Content:** Study design, including surveys and controlled experiments. Sampling and randomization. Scales of measurement. Descriptive and exploratory data analysis. Probability. Statistical inference: sampling distributions, confidence intervals and hypothesis tests for means and proportions. Correlation and regression. Time series analysis. Chi-square tests for frequency tables.

**Text:**


**References:**


#### STATISTICAL INFERENCE 10cp

**Prerequisites:** Either MATH102 or MATH103.

**Hours:** 2 lecture hours, 1 laboratory hour and 1 tutorial hour per week for one semester.

**Content:**

- Random variables, probability, density and distribution functions.

**Text:**


**References:**


#### STAT201 MATHEMATICAL STATISTICS 10cp

**Prerequisites:** Either MATH103 or STAT101 and MATH112 or (a level of mathematics equivalent to MATH112).

**Hours:** 3 lecture hours and 1 laboratory/tutorial hour per week for one semester.

**Content:**

- Random variables, probability, density and distribution functions.

**Text:**


**References:**


#### STAT202 REGRESSION ANALYSIS 10cp

**Prerequisites:** STAT101 and MATH112 (or equivalent).

**Hours:** 2 lecture hours, 1 laboratory hour and 1 tutorial hour per week for one semester.

**Content:**

- This course covers the practical and theoretical aspects of multiple regression analysis, including the assumptions underlying normal linear models, use of matrix notation, prediction and confidence intervals, stepwise methods, and examination of the adequacy of models. The statistical computer packages MINITAB and SAS are used.

**Text:**


**References:**


#### STAT203 QUANTUM SIMULATION 5cp

**Prerequisites:** MATH112 or equivalent.

**For the BSc degree:** STAT203 would also have to be taken. This course covers topics specifically required for Computer Science but is also relevant for Statistics and other disciplines.

**Hours:** 2 lecture/tutorial hours per week for one semester.

**Content:**

- Queues, random number generation, Poisson processes, simulation using MINITAB.

**Text:**


**References:**


#### STAT204 NON-PARAMETRIC METHODS 5cp

**For the BSc degree:** STAT203 would also have to be taken. This course covers topics specifically required for Computer Science but is also relevant for Statistics and other disciplines.

**Hours:** 2 lecture/tutorial hours per week for one semester.

**Content:**

- Methods for analysing categorical and ranked data. Randomization tests.

**References:**


#### STAT205 ENGINEERING STATISTICS 5cp

**Credit cannot be obtained for both STAT201 and STAT205.**

**Prerequisites:** MATH112 or MATH102.

**This subject is mainly taken by students in Mechanical or Industrial Engineering but is also available to other students.**

**Hours:** 2 lecture/tutorial hours per week for one semester.

**Content:**


**References:**


#### STAT206 INFERENCE 10cp

**Prerequisites:** STAT101 and Regression Analysis (STAT202).

**Hours:** 3 hours per week for one semester.

**Content:**

- Statistical inference is the drawing of conclusions from data. The course covers likelihood-based estimation, other methods of point and interval estimation, hypothesis testing and introductory Bayesian inference.

**References:**


#### STAT207 STUDY DESIGN 10cp

**Prerequisites:** Mathematical Statistics (STAT201) and Regression Analysis (STAT202).

**Hours:** 3 hours per week for one semester.

**Content:**

- This course contrasts two methods for collecting and analysing data: experimental studies and non-experimental studies including surveys. The principles of experimental design are illustrated by studying completely randomised designs, randomized block designs and factorial designs. For surveys the topics include: simple random sampling, stratified and cluster sampling, ratio and regression estimators. Class projects are used to illustrate practical problems and the statistical packages BMDP and SAS are used to carry out analyses.

**References:**


#### STAT208 GENERALIZED LINEAR MODELS 10cp

**Prerequisites:** Mathematical Statistics (STAT201) and Regression Analysis (STAT202).

**Hours:** 3 hours per week for one semester.

**Content:**

- The course deals with the theory of generalized linear models and illustrates the ways in which 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 tests, 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.

Text

References

STAT304 TIME SERIES ANALYSIS 16hp
Prerequisites Mathematical Statistics (STAT201) and Regression Analysis (STAT202). In addition it is strongly recommended that students have passed Statistical Inference (STAT301).

Hours 3 Hours per week for one semester

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, SAS and other time series packages.

Text

References

STAT310 TOTAL QUALITY MANAGEMENT 10hp
Prerequisites MNGT111 and subjects at Level 200 totalling 40 credit points chosen from subjects offered by the Departments of Economics, Management and/or Statistics.

Hours 2 lecture hours per week.

Content
Total Quality Management (TQM) is an all-embracing management and employee involvement philosophy directed towards continuous improvement in the production of goods and services. Students who complete this course will learn to understand the fundamental principles of Total Quality Management (TQM), choose appropriate statistical techniques for improving processes and write reports to management describing processes and recommending ways to improve them. Specific topics covered include the Deming philosophy, understanding variability through statistical thinking, quality implementation matrices, quality function deployment, the seven tools of quality control, quality improvement teams, the PDCA cycle, standards, the role of management, basic statistical methods and control charts.

Tests To be advised.

SOME RECOMMENDED PROGRAMS

Advisory Information Only

The choice of subjects now offered by the Faculty of Science and Mathematics has expanded more than two-fold with the advent of semesterisation. In order to provide some guidance to students, each Department has provided one or more possible degree patterns which would lead to a suitable professional qualification in the discipline. The patterns are not prescriptive, except to the extent that they meet the requirements of the various degree rules. Students may vary their selection in conformity with degree rules, and prerequisite and corequisite requirements as detailed in the semester subject tables. All degree courses must aggregate to 240 credit points or 320 points for the four-year Bachelor of Science (Psychology) degree.

All semester subjects are identified by a code which includes up to four letters representing the department offering the subject, followed by three numbers, the first of which signifies the level (100, 200, 300, 400) at which the subject is being presented. The following programs have been set out as recommendations for inclusion in the first, second, and third calendar years of a pass degree. Some programs include a separate postgraduate fourth year for the Honours degree.

AVIATION

Students with Commercial Pilot and Airline Transport Licence will be required to enrol in all subjects, but will be exempted from any sections which they may have completed to the University standard. These exemptions will be decided in consultation with the lecturer concerned, who may request a form of assessment on interview. The course is available only by attendance on campus.

Students are advised to consult the Departmental Noticeboard and liaise with the Head of the Department concerning complicated course program enquiries.

BIOLOGICAL SCIENCES

Students wishing to study Biological Sciences are advised to consult the Faculty of Science for the first year of the Bachelor of Science degree. Students intending to major in Biology should consider Program A. Those wishing to major in Biology and another discipline might elect to complete Programs B or C.

Biological Sciences — Program A

Year 1
BIOL101, BIOL102, CHEM101, CHEM102 and either MATH111/112 or MATH102/103, plus 2 other subjects from Level 100. (For Environmental Biology select G50G101 and G50G102).

Years 2 & 3
The table below indicates the Biological Science subjects which should be studied to enable students to develop expertise in particular areas of the programme. The table is intended to give some guidance to students, but may not cover all the subjects that are available. Additional subjects in the Biological Sciences or other disciplines must be taken to satisfy the remaining requirements for the degree. The table is subject to change from year to year.

The table below indicates the Biological Science subjects which should be studied to enable students to develop expertise in particular areas of the programme. The table is intended to give some guidance to students, but may not cover all the subjects that are available. Additional subjects in the Biological Sciences or other disciplines must be taken to satisfy the remaining requirements for the degree. The table is subject to change from year to year.

BIOLOGICAL SCIENCES — Program A

Year 1
BIOL101, BIOL102, CHEM101, CHEM102 and either MATH111/112 or MATH102/103, plus 2 other subjects from Level 100. (For Environmental Biology select G50G101 and G50G102).

Years 2 & 3
The table below indicates the Biological Science subjects which should be studied to enable students to develop expertise in particular areas of the programme. The table is intended to give some guidance to students, but may not cover all the subjects that are available. Additional subjects in the Biological Sciences or other disciplines must be taken to satisfy the remaining requirements for the degree. The table is subject to change from year to year.
The study of Chemistry is open to all students who have qualified for admission to the University. However, those who have not studied sufficient science at school are advised to do some self-preparation before beginning Level 100 Chemistry subjects. Details on expected backgrounds and suggested remedial reading are provided under the appropriate Level 100 subject descriptions.

The Chemistry Department offers courses over the whole range of the subject. A basic chemical education is available in the traditional areas of analytical, inorganic, organic and physical chemistry together with some more diverse applied subjects. Thus students interested in Environmental Science will find relevant Chemistry subjects (e.g. CHEM261, CHEM450) to include in their program.

The flexible system of subjects offered by the Department allows a student to major in Chemistry on a broad level or to specialise in certain areas of the subject and to combine these with relevant subjects offered by other Departments. Thus a student interested primarily in Physical Chemistry may elect to choose Physics and Mathematics subjects as complements. Conversely, students majoring in other Departments may choose companion Chemistry subjects relevant to their interests. Thus some courses in Analytical and Inorganic Chemistry would be useful to Geology majors; Organic Chemistry subjects would be relevant for Biology majors; Physics majors would benefit from study of some courses in Physical Chemistry, etc. At Level 300 specialist topics in active research areas of Chemistry are offered to provide a modern picture of the subject.

Students intending to do a major in Chemistry would have to complete Program A which is regarded as a minimum requirement for a thorough grounding in the subject. Students wishing to devote themselves fully to Chemistry will undertake a double major as Program B where they can complete up to two thirds of their degree program in this one discipline. Many subject combinations in between these two programs are possible. Thus for example, a student may choose six Level 300 subjects in Chemistry and two from another Department, etc.

Chemistry is a recognized profession which is served by a professional body, the Royal Australian Chemical Institute (RACI). Many employment opportunities for chemists require membership of this organisation. Graduates seeking membership must have completed at least the subjects listed in Program A.

Following either of these programs or combinations thereof may lead to postgraduate study at the Honours degree (Level 400), for which entry requirements are a credit average in at least four Level 300 semester subjects. The Department strongly recommends that HonoursDegree students both for the additional experience it provides and for its enhancement of employment opportunities and professional standing. Honours students devote most of their time to an independent research project in the same field as their formal course work. The project is selected in an area of interest from lists provided by members of the academic staff. This degree is also the normal entry requirement to the research higher degrees (MSc and PhD) offered by the Department.

CHEMISTRY — Program A

Year 1

CHEM101 and CHEM102, either MATH111/112 or MATH110/113, and four other subjects from Level 100.
**NOTE** Pre-requisites will restrict some choice according to Year 2 subjects chosen.

### GEOLOGY

Geology provides the ultimate understanding of our planet, its environment and its evolution. As a natural science, much of the course is outdoors on field excursions and mapping occurs in a diversity of environments. The course is presented as an integrated study of the major processes, hence field, laboratory and theoretical work are interwoven.

Students are strongly advised to choose companion courses, especially if interests are in palaeontology and evolution (biological sciences), surficial processes (geography), geophysics (physics and mathematics), geochemistry, tectonics, mineralogy and petrology (chemistry).

Employment for geologists is available in the mineral, petroleum, coal, environmental and engineering industries. A Bachelor's degree (80 credit points at 300 Level in Geology) is required for membership to the professional body. Employers and the Department very strongly recommend the Honours degree (GEOL401/GEOL402) which allows professional research through some independent investigation.

### MATHEMATICS

The Department of Mathematics offers semester subjects at all levels for the Bachelor of Mathematics degree, the Bachelor of Science degree, the Bachelor of Arts degree and the Bachelor of Engineering degree. However, students wishing to obtain professional qualifications in mathematics should enrol in the Bachelor of Mathematics degree program, where it is possible (although not compulsory) to fill completely their second and third years with mathematics.

Some Faculties use the word "major" to describe a complete strand of study which is considered to be appropriate and sufficiently broad that they may regard the name of the discipline as a component of their degree. The program suggested for the Bachelor of Science degree would fulfill the requirements for a major in mathematics.

**Bachelor of Science Degree — with Mathematics as a major**

This is a course of study which includes at least the following semester subjects:

**Year 1**
- MATH102, or MATH111, 102, 103 or MATH111, 112, 103, together with other level 100 subjects to meet the B.Sc. degree requirements.

**Year 2**
- MATH201, MATH202, MATH204, MATH206, MATH212 and one of (MATH213, MATH214, MATH215) (30 credit points); and a further 60 credit points from MATH200, MATH201, MATH202, MATH203, MATH204, MATH205, MATH206, MATH207, MATH210, MATH212, MATH213, MATH214, MATH215, MATH218, MATH219, MATH221, MATH300, MATH301, MATH302, MATH303, MATH304, MATH305, MATH306, MATH307, MATH308, MATH309, MATH310, MATH311, MATH312, MATH313, MATH314, MATH315, MATH316.

**Year 3**
- MATH300 and/or STAT300 (40 credit points); plus a further 40 credit points from MATH300, MATH301, MATH302, COMP300 and/or PHYS300.

(The BMath (Hons) program consists of MATH400 or STAT400 subjects.)

It has been found that certain combinations of subjects have been popular, and some, in the judgement of the Department, are particularly worthwhile combinations in terms of education or career training. Five such programs are shown below. They are neither exclusive nor prescriptive, but are for your guidance. A further note is added regarding the choice of subjects in Year 1 for the BMath degree.

1. **BMath with "Pure" Mathematics as the major interest**

   To follow the progress of Mathematics is to be well ahead of applications, although Mathematics itself is enriched by those applications. To be able to follow such progress, the student needs to have as wide an experience in Mathematics as possible, and a thorough grounding in the basic truths. Different topics, some selection must be made. Although the program does not appear very "applied", nonetheless graduates with such backgrounds have adapted quickly to careers in industry and commerce as well as in research.

   In satisfying the requirements for the degree, a suitable program is:

   **Year 1**
   - MATH102 and MATH103 together with other subjects worth 60 credit points: (Computer Science and/or Physics and/or Statistics and/or Philosophy) are popular but the choice is wide. See Note 6 below.

   **Year 2**
   - All suitable MATH100 level subjects (except perhaps one of two of MATH213, 214, 215, 216) together with some 200 level subjects to continue a subsidiary interest from Year 1.

   **Year 3**
   - MATH301, MATH302, MATH304, MATH305, MATH306, MATH307, MATH308, MATH310, MATH311, MATH312, MATH313 or MATH314, is a "Pure Mathematics" selection of subjects — but there are variations.

   **Year 4**
   - The BMath (Hons) program consists of Year 4 MATH401 and MATH402.

2. **BMath with Mathematical Physics as a major interest**

   Nowadays a student who wishes to understand current theories of Nature, ranging from the quantum world of elementary particles to the large scale structure of the Universe itself, must be familiar with a formidable amount of mathematics. Areas of mathematics previously the preserve of the pure mathematician have found fruitful application in modern physics. Now the standard tools include functional analysis, group theory, algebra, differential geometry and topology, and the list is continually changing. A student wishing to study the exciting developments in modern mathematical physics needs a strong grounding in those subjects, and the ability to quickly assimilate new mathematics as required, which can only come from a firm grounding in basic "pure" mathematics.

   In satisfying the requirements for the degree, a suitable program could be:

   **Year 1**
   - MATH102 and MATH103 together with other subjects (Physics and Computer Science should be included).

   **Year 2**
   - MATH201, MATH202, MATH203, MATH204, MATH205, MATH206, MATH207, MATH210, MATH212, MATH213, MATH214, MATH215, MATH216, COMP201, STAT201, STAT202, STAT203, STAT204.

   **Year 3**
   - MATH303, MATH304, MATH305, MATH313 together with most of MATH306, MATH307, MATH315, MATH316 (or subjects in Physics or Statistics or Computer Science).

   **Year 4**
   - The BMath (Hons) program consists of Year 4 MATH401 and MATH402.

3. **BMath with Statistics as a major interest**

   (Although STAT401 is shown as desirable, it is not a prerequisite for STAT201 for students in BMath).

   **Year 1**
   - Either STAT101, STAT111 and STAT112 or STAT103, MATH201 and MATH203. STAT401 is recommended. Choose other subjects worth 50 credit points from Level 100.

   **Year 2**
   - MATH201, MATH202, MATH203, MATH204, MATH205, MATH212, a course of (MATH213, MATH214, MATH215), together with STAT201, STAT202, STAT203, STAT204 together with other Mathematics or Computer Science 200 level subjects for the remaining 20 credit points.

   **Year 3**
   - STAT301, STAT302, STAT303, STAT304 with four mathematics and/or computer science 300 level subjects for the remaining 40 credit points.

   **Year 4**
   - The BMath (Hons) program consists of Year 4 STAT400.

4. **BMath with Computer Science as a major interest**

   (Although STAT101 is shown as desirable, it is not a prerequisite for STAT201 for students in BMath).

   **Year 1**
   - Choose other subjects worth 50 credit points from Level 100.

   **Year 2**
   - MATH201, MATH202, MATH203, MATH204, MATH205, MATH212, a course of (MATH213, MATH214, MATH215), together with STAT201, STAT202, STAT203, STAT204 together with other Mathematics or Computer Science 200 level subjects for the remaining 20 credit points.

   **Year 3**
   - STAT301, STAT302, STAT303, STAT304 with four mathematics and/or computer science 300 level subjects for the remaining 40 credit points.

   **Year 4**
   - The BMath (Hons) program consists of Year 4 STAT400.

In satisfying the requirements for the degree, a suitable program would be:
Institute of Physics. The Institute also responds on behalf of recognition and status are no formal conditions for registration as a physicist, but a of suitability for admission to membership of the Australian degree is usually necessary for government and industry admission to the University.

It is advisable for intending physicists to include ample mathematics in their course and pursue a related science such as Chemistry or Geology to Level 200 subjects if at all possible.

A Physics major in the Bachelor of Science degree at least the following semester subject structure is necessary

- PHYS102, PHYS103, MATH102 and MATH103.
- Choose four other subjects from Level 100, preferably leading to Level 200 at least one other science discipline.

- PHYS201 and at least two subjects chosen from PHYS202, PHYS203 and PHYS205, and MATH101 (advise).

Physics (PHYS101/102 or 103), Information Science and Statistics (INP101/102), but BMath students choose widely, and the following areas have been approved for them in the past:

- Accounting, Biology, Chemistry, Classical Civilisation, Drama, Engineering, Economics, English, French, Geology, German, Greek, History, Japanese, Latin, Legal Studies, Linguistics, Philosophy, Psychology, Sanskrit, Sociology.

There is room in the BMath course to include Level 200 subjects to continue with one of the choices made during the first year course.

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, but a degree is usually necessary for government and industry recognition and status as a professional physicist.

PSYCHOLOGY
As a discipline, Psychology is open to all students who gain admission to the University. Psychology is a broad discipline and it is difficult to state preparatory subjects that should be studied together with Psychology.

Recently legislation was passed through the State Parliament which will require anyone wishing to practise as a psychologist to have a minimum of four years training. In the Science and Mathematics Faculty, Psychology can be taken either as a BSc or a BSc(Psychology) degree. The BSc degree is a three year course which can be followed by a fourth or Honours year. The BSc (Psychology) degree is a four year degree. The programs within these two degrees are set out below.

The Department aims to produce "psychologists who should by virtue of their training be able to play a unique role such as critically examining research and scholarly literature in the field of psychology, contributing to empirical research in psychology, administering and interpreting psychological tests and measurement procedures and prescribing, implementing and evaluating forms of psychological intervention and remediation".

Entry to Psychology 401 and 402 requires completion of 60 credit points at PSYC300 or STAT301 and PSYC302. Entry to PSYC403 and PSYC404 requires Pass grades in at least six 300 level subjects.

The Department offers two Applied Masters Degrees. The Master of Psychology (Clinical) degree has an Honours entry requirement while the Master of Psychology (Educational) has an undergraduate degree with a major in Psychology as an entry requirement, teaching qualification and in addition, two years teaching (or other relevant) experience. The Honours degree is the normal entry into the research degrees of Master of Science and Doctor of Philosophy.

SSECTON SIX
RECOMMENDED PROGRAMS

BSc with a Psychology Major

Year 1
PSYC101, PSYC102 plus 6 other semester subjects at level 100.

Year 2
PSYC201, PSYC202, PSYC203 plus other subjects at the 200 level, some of which may also be taken in Psychology.

Year 3
PSYC301, PSYC302, PSYC303 plus at least one other chosen from PSYC204, PSYC206, PSYC305 or PSYC308, and four other subjects chosen at the 300 level.

BSc Honours Degree in Psychology

Year 1
PSYC101, PSYC102, plus 6 other subjects from level 100.

Year 2
Eight 200 level subjects including PSYC201, PSYC202, PSYC203 and PSYC204 plus other 200 level subjects chosen from the scheduled list.

Year 3
PSYC301, PSYC302 and at least four other Psychology subjects at the 300 level, plus other 300 level subjects chosen from the scheduled list including those offered by the Psychology Department.

Year 4
PSYC401 and PSYC402. Entry to the Honours degree requires passes in four Psychology subjects at the 200 level including PSYC201 as well as completion of 60 credit points at PSYC300 obtaining at least a Credit grade average in each of four 300 Level 4 Psychology subjects at the 300 level including PSYC301 and PSYC302.

BSc (Psychology) awarded at Honours Level

Years 1 and 2 As for Psychology Honours above.

Year 3
PSYC301, PSYC302 and at least four other Psychology subjects at the 300 level, plus other 300 level subjects chosen from the scheduled list including those offered by the Psychology Department.

Year 4
PSYC401 and PSYC402. Entry to the Honours degree requires passes in four Psychology subjects at the 200 level including PSYC201 as well as completion of 60 credit points at PSYC300 obtaining at least a Credit grade average in each of four 300 Level 4 Psychology subjects at the 300 level including PSYC301 and PSYC302.

BSc (Psychology) Degree

Years 1 and 2 As for Psychology Honours above.

Year 3
PSYC301, and at least five other Psychology subjects at the 300 level, plus other 300 level subjects chosen from the scheduled list including those offered by the Psychology Department.

Year 4
PSYC403 and PSYC404.

STATISTICS

Statistics has been described as the science of turning data into information. This involves collecting, presenting and analysing data, interpreting the results and using them to draw conclusions or make decisions. The principles of Statistics are based on ideas from the philosophy of science and mathematics and, more recently, from developments in computing. Computers play an essential role in Statistics for data management and analysis. Statistics is a practical subject. It involves designing experimental plans and sampling procedures, calculating how many subjects or objects should be studied and determining how the measurements should be made in order to obtain data which is reliable, accurate and relevant. Methods of statistical analysis, based on mathematics including probability theory, are used to decide what conclusions can validly be drawn from the data.

The Statistics Department offers subjects from the 100 level through to the Honours level. Research degrees may be pursued in the area of Statistics. For a major in Statistics a student should take the following subjects:

- STAT101 and MATH112 or MATH102 and MATH103. Choose other subjects worth 60 credit points from Level 100.
- STAT201, STAT202, STAT303, STAT304. Choose other subjects worth 45 credit points from Level 200.
- STAT301, STAT302, STAT303, STAT304. Choose other subjects worth 40 credit points from Level 300.
- 80 credit points selected from STAT401 to STAT411.
POSTGRADUATE DEGREE RULES

SCHEDULE — HONOURS DEGREE OF BACHELOR SCIENCE

Admission to Candidature

1. A candidate may undertake the honours degree in either one or two disciplines.
2. In order to be admitted to candidature for the degree in a single discipline an applicant shall:
   (a) have completed the requirements for admission to the Ordinary Degree of Bachelor of Science of the University or to any other degree approved by the Faculty Board; and
   (b) have completed such other work prescribed in accordance with the policy determined by the Faculty Board on the recommendation of the Head of the Department responsible for the discipline.
3. In order to be admitted to candidature for the degree in two disciplines, an applicant shall:
   (a) have completed the requirements for admission to the Ordinary Degree of Bachelor of Science of the University or to any other degree approved by the Faculty Board; and
   (b) have completed such other work prescribed in accordance with the policy determined by the Faculty Board on the recommendation of the Heads of the Departments responsible for the disciplines.

Qualification for Admission to the Degree

4. To qualify for admission to the degree a candidate shall pass subjects at the 400 level totalling 80 credit points chosen from the list of Approved Subjects.

Clases of Honours

5. 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.

Time Requirements

6. Except with the permission of the Faculty Board, a candidate shall complete the course in not more than two years of study.

Approved Subjects

The subjects approved by the Faculty Board for the award are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>Prerequisite</th>
<th>Corequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL401</td>
<td>Biology Honours 401</td>
<td>40</td>
<td>40 cp 300 BIOL or other 300 level subjects approved by the Department, obtaining at least a Credit grade average</td>
<td></td>
</tr>
<tr>
<td>BIOL402</td>
<td>Biology Honours 402</td>
<td>40</td>
<td>40 cp 300 BIOL or other 300 level subjects approved by the Department, obtaining at least a Credit grade average</td>
<td></td>
</tr>
<tr>
<td>CHEM401</td>
<td>Chemistry Honours 401</td>
<td>40</td>
<td>40 cp level 300 CHEM obtaining at least a Credit grade average</td>
<td></td>
</tr>
<tr>
<td>CHEM402</td>
<td>Chemistry Honours 402</td>
<td>40</td>
<td>40 cp level 300 CHEM obtaining at least a Credit grade average</td>
<td></td>
</tr>
<tr>
<td>GEOG401</td>
<td>Geography Honours 401</td>
<td>40</td>
<td>40 cp level 300 GEOG obtaining at least a Credit grade average</td>
<td></td>
</tr>
<tr>
<td>GEOG402</td>
<td>Geography Honours 402</td>
<td>40</td>
<td>40 cp level 300 GEOG obtaining at least a Credit grade average</td>
<td></td>
</tr>
<tr>
<td>GEOL401</td>
<td>Geology Honours 401</td>
<td>40</td>
<td>40 cp level 300 GEOL obtaining at least a Credit grade average</td>
<td></td>
</tr>
<tr>
<td>GEOL402</td>
<td>Geology Honours 402</td>
<td>40</td>
<td>40 cp level 300 GEOL obtaining at least a Credit grade average</td>
<td></td>
</tr>
<tr>
<td>MATH401</td>
<td>Mathematics Honours 401</td>
<td>40</td>
<td>40 cp level 300 MATH obtaining at least a Credit grade average</td>
<td></td>
</tr>
<tr>
<td>MATH402</td>
<td>Mathematics Honours 402</td>
<td>40</td>
<td>MATH401</td>
<td></td>
</tr>
<tr>
<td>PHYS401</td>
<td>Physics Honours 401</td>
<td>40</td>
<td>Any three PHYS300 subjects and PHYS301 obtaining at least a Credit grade average</td>
<td></td>
</tr>
<tr>
<td>PHYS402</td>
<td>Physics Honours 402</td>
<td>40</td>
<td>PHYS401</td>
<td></td>
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<tr>
<td>PSYC401</td>
<td>Psychology Honours 401(Seminar)</td>
<td>40</td>
<td>Four PSYC200 subjects incl. PSYC201 and 60 cp at PSYC300 obtaining at least a Credit grade in each of four PSYC300 including PSYC301 and PSYC302</td>
<td></td>
</tr>
<tr>
<td>PSYC402</td>
<td>Psychology Honours 402(Thesis)</td>
<td>40</td>
<td>PSYC401</td>
<td></td>
</tr>
</tbody>
</table>

A candidate may pursue a combined honours degree in one honours subject from each of two Departments with the approval of the Heads of both Departments.
SCHEDULE — HONOURS DEGREE OF BACHELOR OF SCIENCE (AVIATION)

Admission to Candidature
1. In order to be admitted to candidacy for the degree an applicant shall:
   (a) have completed the requirements for admission to the Ordinary Degree of Bachelor of Science (Aviation) of the University or to any other degree approved by the Faculty Board, or have already been admitted to that degree; and
   (b) have completed any additional work prescribed in accordance with the policy determined by the Faculty Board on the recommendation of the Head of the Department of Aviation.

Qualification for Admission to the Degree
2. To qualify for admission to the degree a candidate shall pass subjects at the 400 level totalling 80 credit points chosen from the list of Approved Subjects.

Classes of Honours
3. 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.

Time Requirements
4. Except with the permission of the Faculty Board, a candidate shall complete the course in not more than two years of study.

APPROVED SUBJECTS
The subjects approved by the Faculty Board for the award are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>Prerequisite</th>
<th>Corequisite</th>
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</thead>
<tbody>
<tr>
<td>AVIA401</td>
<td>Aviation Honours 401</td>
<td>20</td>
<td>B.Sc.(Aviation) with a Credit grade average in AVIA308, AVIA310, AVIA311, and AVIA314</td>
<td>AVIA401, AVIA402, AVIA403, AVIA404</td>
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<tr>
<td>AVIA402</td>
<td>Aviation Research</td>
<td>10</td>
<td>AVIA310, AVIA312, AVIA313, and AVIA314</td>
<td>AVIA311, AVIA314</td>
</tr>
<tr>
<td>AVIA403</td>
<td>Technology in Aviation</td>
<td>10</td>
<td>B.Sc.(Aviation) with an average obtaining Credit grades in AVIA308, AVIA310, AVIA311, and AVIA314</td>
<td>AVIA403, AVIA404, AVIA405</td>
</tr>
<tr>
<td>AVIA404</td>
<td>The Human Variable</td>
<td>10</td>
<td>Way to AVIA401</td>
<td>AVIA401, AVIA402</td>
</tr>
<tr>
<td>AVIA405</td>
<td>Aviation Honours — Thesis</td>
<td>40</td>
<td>AVIA308, AVIA310, AVIA311, and AVIA314</td>
<td>AVIA401, AVIA403, AVIA404</td>
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</table>
SECTION SEVEN

SCHEDULE — HONOURS DEGREE OF BACHELOR OF APPLIED SCIENCE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT

Admission to Candidature

1. In order to be admitted to candidature for the degree in a single discipline an applicant shall:

   (a) have completed the requirements for admission to the Ordinary Degree of Bachelor of Applied Science (Environmental Assessment and Management) of the University or to any other degree approved by the Faculty Board, or have already been admitted to that degree; and

   (b) have completed any additional work prescribed in accordance with the policy determined by the Faculty Board on the recommendation of the Head of Department of Applied Science and Technology.

Qualification for Admission to the Degree

2. To qualify for admission to the degree a candidate shall pass subjects at the 400 level totalling 80 credit points chosen from the list of Approved Subjects.

Classes of Honours

3. 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.

Time Requirements

4. Except with the permission of the Faculty Board, a candidate shall complete the course in not more than two years of study.

APPROVED SUBJECTS

The subjects approved by the Faculty Board for the award are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>Prerequisite</th>
<th>Corequisite</th>
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<tbody>
<tr>
<td>EAMS401</td>
<td>Environmental Management</td>
<td>20</td>
<td>EAMS301, EAMS311</td>
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<td></td>
<td></td>
<td></td>
<td>Forty credit points</td>
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<td>level 300 EAMS</td>
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<td>obtaining at least a</td>
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<td></td>
<td></td>
<td></td>
<td>Credit grade average</td>
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<tr>
<td>EAMS402</td>
<td>Seminar Series</td>
<td>20</td>
<td></td>
<td></td>
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<tr>
<td>EAMS404</td>
<td>Research Project</td>
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</tbody>
</table>
SCHEDULE — HONOURS DEGREE OF BACHELOR OF MATHEMATICS

Admission to Candidature
1. A candidate may undertake the honours degree in either one or two disciplines.
2. In order to be admitted to candidature for the degree in a single discipline an applicant shall:
   (a) have completed the requirements for admission to the Ordinary Degree of Bachelor of Mathematics of the University or to any other degree approved by the Faculty Board; and
   (b) have completed such other work prescribed in accordance with the policy determined by the Faculty Board on the recommendation of the Head of the Department responsible for the discipline.
3. In order to be admitted to candidature for the degree in two disciplines, an applicant shall:
   (a) have completed the requirements for admission to the Ordinary Degree of Bachelor of Mathematics of the University or to any other degree approved by the Faculty Board; and
   (b) have completed such other work prescribed in accordance with the policy determined by the Faculty Board on the recommendation of the Heads of the Departments responsible for the disciplines.

Qualification for Admission to the Degree
4. To qualify for admission to the degree a candidate shall pass subjects at the 400 level totalling 80 credit points chosen from the list of Approved Subjects.

Classes of Honours
5. 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.

Time Requirements
6. Except with the permission of the Faculty Board, a candidate shall complete the course in not more than two years of study.

APPROVED SUBJECTS

The subjects approved by the Faculty Board for the award are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH401</td>
<td>Mathematics Honours 401</td>
<td>40</td>
<td>40 cp level 300 MATH subjects obtaining at least a Credit grade average</td>
</tr>
<tr>
<td>MATH402</td>
<td>Mathematics Honours 402</td>
<td>40</td>
<td>MATH401</td>
</tr>
<tr>
<td>STAT401</td>
<td>Probability Theory</td>
<td>10</td>
<td>40 cp from level 300 STAT subjects obtaining at least a Credit grade average</td>
</tr>
<tr>
<td>STAT402</td>
<td>Analysis of Categorical Data</td>
<td>10</td>
<td>As for STAT401</td>
</tr>
<tr>
<td>STAT403</td>
<td>Demography and Survival Analysis</td>
<td>10</td>
<td>As for STAT401</td>
</tr>
<tr>
<td>STAT404</td>
<td>Robust Regression and Smoothing</td>
<td>10</td>
<td>As for STAT401</td>
</tr>
<tr>
<td>STAT405</td>
<td>Statistical Consulting</td>
<td>10</td>
<td>As for STAT401</td>
</tr>
<tr>
<td>STAT406</td>
<td>Methods for Quality Improvement</td>
<td>10</td>
<td>As for STAT401</td>
</tr>
<tr>
<td>STAT407</td>
<td>Advanced Topics in Statistics</td>
<td>10</td>
<td>As for STAT401</td>
</tr>
<tr>
<td>STAT408</td>
<td>Project</td>
<td>10</td>
<td>As for STAT401</td>
</tr>
<tr>
<td>STAT409</td>
<td>Project</td>
<td>20</td>
<td>As for STAT401</td>
</tr>
<tr>
<td>STAT410</td>
<td>Project</td>
<td>30</td>
<td>As for STAT401</td>
</tr>
<tr>
<td>STAT411</td>
<td>Project</td>
<td>40</td>
<td>As for STAT401</td>
</tr>
</tbody>
</table>

A candidate may enrol in 80 credit points, to be chosen from:

- Mathematics Honours 401 (40 cp level 300 MATH subjects obtaining at least a Credit grade average)
- Economics Honours IV (40 cp level 300 ECON subjects obtaining at least a Credit grade average)
- Geology Honours 401 (40 cp level 300 GSSL subjects obtaining at least a Credit grade average)
- Psychology Honours 401 (40 cp level 300 PSYD subjects obtaining at least a Credit grade average)

A candidate may pursue a combined honours degree in one honours subject from each of two Departments in one of the following combinations:

- MATH401 Mathematics Honours 401 (40 cp level 300 MATH subjects obtaining at least a Credit grade average)
- ECON401 Economics Honours IV (40 cp level 300 ECON subjects obtaining at least a Credit grade average)
- GSSL401 Geology Honours 401 (40 cp level 300 GSSL subjects obtaining at least a Credit grade average)
- PSYD401 Psychology Honours 401 (40 cp level 300 PSYD subjects obtaining at least a Credit grade average)
SECTION SEVEN
POSTGRADUATE DEGREE RULES

SCHEDULE — GRADUATE DIPLOMA IN ENVIRONMENTAL STUDIES

Admission to Candidate
1. In order to be admitted to candidature for the diploma an applicant shall:
   (a) have satisfied all the requirements for admission to a degree of the University or to any other degree approved by the Faculty Board or have achieved at another tertiary institution a standard of performance deemed by the Faculty Board to be equivalent; and
   (b) have completed such other work prescribed in accordance with the policy determined by the Faculty Board; or
   (c) in exceptional cases, produce evidence of possessing such other qualifications as may be approved by the Faculty Board.

Qualification for Admission to the Diploma
2. To qualify for admission to the diploma a candidate shall complete subjects totalling 80 credit points from the list of Approved Subjects, including 40 credit points in subjects at the 400 level or higher.

Grading of the Diploma
3. The diploma shall be conferred as an Ordinary Diploma except that, where the performance of a candidate has reached a standard determined by the Faculty Board to be sufficient, the diploma may be conferred with Merit.

Time Requirements
4. Except with the permission of the Faculty Board, a candidate shall complete the course in not more than two years of study.

APPROVED SUBJECTS
The Subjects approved* by the Faculty Board for the award are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>Prerequisite</th>
<th>Corequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL303</td>
<td>Environmental Plant Physiology</td>
<td>10</td>
<td>Two BIOL200</td>
<td></td>
</tr>
<tr>
<td>BIOL311</td>
<td>Environmental Biology</td>
<td>10</td>
<td>BIOL207 or BIOL203</td>
<td>Students who have completed BIOL306 are not eligible to do this subject</td>
</tr>
<tr>
<td>CHEM261</td>
<td>Environmental Chemistry</td>
<td>10</td>
<td>CHM101, CHM102</td>
<td></td>
</tr>
<tr>
<td>CHEM361</td>
<td>Environmental Chemistry</td>
<td>10</td>
<td>CHM261</td>
<td></td>
</tr>
<tr>
<td>CHBS342</td>
<td>Safety and Environment</td>
<td>10</td>
<td>Consult Head of Department</td>
<td></td>
</tr>
<tr>
<td>CVL242</td>
<td>Environmental Engineering 2</td>
<td>5</td>
<td>CVL141</td>
<td></td>
</tr>
<tr>
<td>EDUC612</td>
<td>The Scope of Environmental Education</td>
<td>10</td>
<td>Consult Education Department</td>
<td></td>
</tr>
<tr>
<td>EDUC613</td>
<td>Issues and Research in Environmental Education</td>
<td>10</td>
<td>Consult Education Department</td>
<td></td>
</tr>
<tr>
<td>GEOG305</td>
<td>Climatic Problems</td>
<td>10</td>
<td>GEOG203</td>
<td></td>
</tr>
<tr>
<td>GEOG306</td>
<td>Geography of Australia: an Historic Perspective</td>
<td>10</td>
<td>GEOG205 or GEOG206</td>
<td></td>
</tr>
<tr>
<td>GEOG311</td>
<td>Hydrology</td>
<td>10</td>
<td>GEOG201, GEOG203</td>
<td></td>
</tr>
<tr>
<td>GEOG491</td>
<td>Environmental Studies Seminar 1</td>
<td>20</td>
<td>Consult Department of Mechanical Engineering</td>
<td></td>
</tr>
<tr>
<td>GEOG492</td>
<td>Environmental Studies Minor Project</td>
<td>10</td>
<td>Consult Department of Mechanical Engineering</td>
<td></td>
</tr>
<tr>
<td>GEOG595</td>
<td>Directed Environmental Study 1</td>
<td>10</td>
<td>Consult Department of Mechanical Engineering</td>
<td></td>
</tr>
<tr>
<td>GEOG596</td>
<td>Directed Environmental Study 2</td>
<td>10</td>
<td>Consult Department of Mechanical Engineering</td>
<td></td>
</tr>
<tr>
<td>MECH407</td>
<td>Environmental Engineering</td>
<td>5</td>
<td>Consult Department of Mechanical Engineering</td>
<td></td>
</tr>
<tr>
<td>PHIL391</td>
<td>Technology and Human Values I</td>
<td>10</td>
<td>Consult Department</td>
<td></td>
</tr>
<tr>
<td>PHIL491</td>
<td>Technology, Human Values and The Environment</td>
<td>10</td>
<td>Consult Department</td>
<td></td>
</tr>
<tr>
<td>SOC304</td>
<td>Medicine in Industrial Society</td>
<td>20</td>
<td>20 c.p. at 200 level including SOC201</td>
<td></td>
</tr>
<tr>
<td>SUK473</td>
<td>Town Planning</td>
<td>10</td>
<td>Consult Department</td>
<td></td>
</tr>
</tbody>
</table>

Footnote
Lease of Absence — For the purposes of Rule 10 of the Rules Governing Academic Awards, a candidate shall be deemed to be in good standing if, at the conclusion of the year of last enrolment in the course, that candidate was eligible to re-enrol without restrictions.

*Or such subjects considered necessary upon approval of the Dean.
SECTION SEVEN

GRADUATE DIPLOMA IN
MATHEMATICAL STUDIES

Admission to Candidature

1. An applicant for admission to candidature for the Diploma shall:
   (a) have satisfied all the requirements for admission to a degree of the University or to a degree of any other tertiary institution approved for this purpose by the Faculty Board;
   (b) in exceptional circumstances have other qualifications approved for this purpose by the Faculty Board.

Qualification for Admission to the Diploma

In order to be admitted to the course an applicant shall:

(a) have satisfied all the requirements for admission to a degree of the University or to any other degree approved by the Faculty Board;
(b) have completed such other work prescribed in accordance with the policy determined by the Faculty Board;
(c) in exceptional cases, produce evidence of possessing such other qualifications as may be approved by the Faculty Board.

The subjects approved by the Faculty Board for the award are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL405</td>
<td>Biology Diploma 405</td>
<td>40</td>
</tr>
<tr>
<td>CHEM405</td>
<td>Chemistry Diploma 405</td>
<td>40</td>
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<tr>
<td>GEOG405</td>
<td>Geography Diploma 405</td>
<td>40</td>
</tr>
<tr>
<td>GEOL405</td>
<td>Geology Diploma 405</td>
<td>40</td>
</tr>
<tr>
<td>PHYS405</td>
<td>Physics Diploma 405</td>
<td>40</td>
</tr>
<tr>
<td>PSYC405</td>
<td>Psychology Diploma 405</td>
<td>40</td>
</tr>
</tbody>
</table>

Footnote

Leaves of Absence — For the purposes of Rule 10 of the Rules Governing Academic Awards, a candidate shall be deemed to be in good standing if, at the conclusion of the year of last enrolment in the course, that candidate was eligible to re-enrol without restrictions.
RULES GOVERNING MASTERS DEGREES

SCHEDULE — MASTER OF ENVIRONMENTAL STUDIES

These Rules are currently being revised. Copies of the revised Rules are available from the Assistant Registrar, Faculty of Science and Mathematics.

## APPROVED SUBJECTS

The subjects approved by the Faculty Board for the award are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>Prerequisite</th>
<th>Co-requisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL303</td>
<td>Environmental Plant Physiology</td>
<td>10</td>
<td>Two BIOL200</td>
<td></td>
</tr>
<tr>
<td>BIOL311</td>
<td>Environmental Biology</td>
<td>10</td>
<td>BIOL207 or BIOL203</td>
<td>Students who have completed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BIOL306 are not eligible to do this subject</td>
<td></td>
</tr>
<tr>
<td>CHEM261</td>
<td>Environmental Chemistry</td>
<td>10</td>
<td>CHEM101, CHEM102</td>
<td></td>
</tr>
<tr>
<td>CHEM361</td>
<td>Environmental Chemistry</td>
<td>10</td>
<td>CHEM261</td>
<td></td>
</tr>
<tr>
<td>CHEE342</td>
<td>Safety and Environment</td>
<td>10</td>
<td>Consult Head of Department</td>
<td></td>
</tr>
<tr>
<td>CIVL242</td>
<td>Environmental Engineering 2</td>
<td>5</td>
<td>CIVL141</td>
<td></td>
</tr>
<tr>
<td>EDUC612</td>
<td>The Scope of Environmental Education</td>
<td>10</td>
<td>Consult Education Department</td>
<td></td>
</tr>
<tr>
<td>EDUC613</td>
<td>Issues and Research in Environmental Education</td>
<td>10</td>
<td>Consult Education Department</td>
<td></td>
</tr>
<tr>
<td>GEOG304</td>
<td>The Biosphere and Conservation</td>
<td>10</td>
<td>GEOG203</td>
<td></td>
</tr>
<tr>
<td>GEOG305</td>
<td>Climatic Problems</td>
<td>10</td>
<td>GEOG203</td>
<td></td>
</tr>
<tr>
<td>GEOG306</td>
<td>A Geography of Australia, Historical Perspective</td>
<td>10</td>
<td>GEOG202 plus either GEOG205 or GEOG206</td>
<td></td>
</tr>
<tr>
<td>GEOG309</td>
<td>Society and Space</td>
<td>10</td>
<td>GEOG202 plus either GEOG205 or GEOG206</td>
<td></td>
</tr>
<tr>
<td>GEOG311</td>
<td>Hydrology</td>
<td>10</td>
<td>GEOG201, GEOG203</td>
<td></td>
</tr>
<tr>
<td>GEOG491</td>
<td>Environmental Studies Minor Project</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG492</td>
<td>Environmental Studies Major Project</td>
<td>10</td>
<td></td>
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</tr>
<tr>
<td>GEOG591</td>
<td>Environmental Studies Major Project</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG592</td>
<td>Environmental Studies Major Project II</td>
<td>20</td>
<td></td>
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</tr>
<tr>
<td>GEOG593</td>
<td>Environmental Studies</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG594</td>
<td>Environment Study Seminar 2</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG595</td>
<td>Directed Environmental Study 1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG596</td>
<td>Directed Environmental Study 2</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOIL320</td>
<td>Geology of Quaternary Environments</td>
<td>10</td>
<td>GEOIL213 or GEOG204</td>
<td></td>
</tr>
<tr>
<td>MECH308</td>
<td>Noise Pollution</td>
<td>5</td>
<td>Consult Department of Mechanical Engineering</td>
<td></td>
</tr>
<tr>
<td>MECH407</td>
<td>Environmental Engineering</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OHS502</td>
<td>Occupational Hygiene and Toxicology</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHIL391</td>
<td>Technology and Human Values</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHIL392</td>
<td>Technology, Human Values and The Environment</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOC304</td>
<td>Medicine in Industrial Society</td>
<td>20</td>
<td>20 c.p. at 200 level including SOC201</td>
<td>Consult Department</td>
</tr>
<tr>
<td>SURV473</td>
<td>Town Planning</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Or such subjects considered necessary upon approval of the Dean.
SECTION SEVEN

SCHEDULE — MASTER OF MATHEMATICS

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

2. 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 with honours in the area of study in which the applicant proposes to carry out research or to an Honours degree, approved for this purpose by the Faculty Board, of another University; or
   (b) 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 tertiary institution and have completed such work and sat for 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 academic or professional qualifications as may be approved by the Faculty Board.

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

4. The program shall be completed in not less than two years except that, in the case of a candidate who has completed the requirements for a degree of Bachelor with Honours or for a qualification deemed by the Faculty Board to be equivalent or who has had previous research experience, the Faculty Board may reduce this period by up to one year.

5. A part-time candidate shall, except with the permission of the Faculty Board, which shall be given only in special circumstances:
   (a) conduct the major proportion of the research or design work in the University; and
   (b) take part in research seminars within the Department in which the program is being carried out.

6. Any third examiner shall be an external examiner.

SCHEDULE — MASTER OF MATHEMATICS

These Rules are currently being revised. Copies of the revised Rules are available from the Assistant Registrar, Faculty of Science and Mathematics.

SCHEDULE — MASTER OF PSYCHOLOGY (EDUCATIONAL)

These Rules are currently being revised. Copies of the revised Rules are available from the Assistant Registrar, Faculty of Science and Mathematics.

SCHEDULE — MASTER OF PSYCHOLOGY (CLINICAL)

These Rules are currently being revised. Copies of the revised Rules are available from the Assistant Registrar, Faculty of Science and Mathematics.

APPROVED SUBJECTS

The subjects approved by the Faculty Board for the Award are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>When Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC521</td>
<td>Counselling and Psychotherapy I</td>
<td>20</td>
<td>Full Year</td>
</tr>
<tr>
<td>PSYC522</td>
<td>Counselling and Psychotherapy II</td>
<td>20</td>
<td>Full Year</td>
</tr>
<tr>
<td>PSYC523</td>
<td>The Client: Diagnosis and Treatment I</td>
<td>20</td>
<td>Full Year</td>
</tr>
<tr>
<td>PSYC524</td>
<td>The Client: Diagnosis and Treatment II</td>
<td>20</td>
<td>Full Year</td>
</tr>
<tr>
<td>PSYC525</td>
<td>Professional Practice and Consultancy Skills I</td>
<td>20</td>
<td>Full Year</td>
</tr>
<tr>
<td>PSYC526</td>
<td>Professional Practice and Consultancy Skills II</td>
<td>20</td>
<td>Full Year</td>
</tr>
<tr>
<td>PSYC527</td>
<td>Research Methodology and Thesis I</td>
<td>20</td>
<td>Full Year</td>
</tr>
<tr>
<td>PSYC528</td>
<td>Research Methodology and Thesis II</td>
<td>20</td>
<td>Full Year</td>
</tr>
</tbody>
</table>
SCHEDULE — MASTER OF SCIENCE

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

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 the program.

(2) To be eligible for admission to candidature in the Faculty of Engineering 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 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
   (b) in exceptional cases produce evidence of possessing such other qualifications as may be approved by the Faculty Board on the recommendation of the Head of the Department in which the applicant proposes to carry out the program.

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

4. The program shall be completed:
   (a) in not less than two academic years except that, in the case of a candidate who has completed the requirements for a degree of Bachelor with Honours or a qualification deemed by the Faculty Board to be equivalent or who has had previous research experience, the Faculty Board may reduce this period to not less than one academic year; and
   (b) except with the permission of the Faculty Board, in not more than five years.

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

(2) Except with the permission of the Faculty Board, a candidate enrolled in the Faculty of Engineering shall take part in the research seminars within the Department in which the program is being carried out.

SCHEDULE — MASTER OF SCIENTIFIC STUDIES

These Rules are currently being revised. Copies of the revised Rules are available from the Assistant Registrar, Faculty of Science and Mathematics.
SECTION SEVEN

POSTGRADUATE DEGREE RULES

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Credit Points</th>
<th>When Offered</th>
<th>Prerequisite</th>
<th>Corequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH697</td>
<td>Advanced Topics in Mathematics</td>
<td>40</td>
<td>Not in</td>
<td>MATH696</td>
<td></td>
</tr>
<tr>
<td>MATH698</td>
<td>Project</td>
<td>40</td>
<td>Not in 1993</td>
<td></td>
<td>MATH696</td>
</tr>
<tr>
<td>PHYS695</td>
<td>Foundations of Physics</td>
<td>40</td>
<td>S1, S2, FY</td>
<td>Appropriate</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>undergraduate</td>
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<td>subjects</td>
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<tr>
<td>PHYS696</td>
<td>Topics in Physics</td>
<td>40</td>
<td>S1, S2, FY</td>
<td>PHYS695</td>
<td></td>
</tr>
<tr>
<td>PHYS697</td>
<td>Advanced Topics in Physics</td>
<td>40</td>
<td>Not in</td>
<td>PHYS695</td>
<td></td>
</tr>
<tr>
<td>PHYS698</td>
<td>Project</td>
<td>40</td>
<td>Not in 1993</td>
<td>PHYS696</td>
<td></td>
</tr>
<tr>
<td>PSYC695</td>
<td>Foundations of Psychology</td>
<td>40</td>
<td>Not in 1993</td>
<td>Appropriate</td>
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A candidate may pursue subjects in two disciplines with the approval of the Heads of both Departments and the Dean of the Faculty of Science and Mathematics.

SECTION EIGHT

POSTGRADUATE DEGREE SUBJECT DESCRIPTIONS

Notes 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 at a Pass grade or better before a candidate enrols in a particular subject. The only prerequisite 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 rules “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 attempts have been made to indicate for each subject how assessment is determined.

Tests are essential books recommended for purchase.

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

LIST OF APPROVED SUBJECTS REFERRED TO IN HONOURS DEGREES IN THE FACULTY OF SCIENCE AND MATHEMATICS

Entry to an Honours degree requires a Credit or better average in appropriate 300 level subjects; see prerequisite requirements for relevant subjects.

APPLIED SCIENCE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT

EAMS401 ENVIRONMENTAL MANAGEMENT 20 cp

Prerequisite EAMS301, EAMS311. Forty credit points level 300 EAMS obtaining at least a Credit grade average

Assessment

(a) Two major essays

(b) Presentation by each student of two seminar topics

(c) Satisfactory standard reached in a two hour written examination at the end of the year

Content

Policy making in environmental assessment and management, administration in environmental management, federal and state environmental legislation, role of relevant government agencies and commissions, government policies and reports, national and international conventions, the roles of the United Nations Environment Program and the World Commission on Environment and Development, the professional practice of environmental management, procedures for consultancy, policy making in private industry, codes of ethics, the environmental audit, environmental risk analysis, trends in environmental management, the public consultation process, conflict resolution in environmental decision making.

Text To be advised

References


AVIATION
AVIA401 AVIATION HONOURS 401 20cp
Prerequisites B.Sc. (Aviation) with a Credit grade average or better in AVIA308, AVIA310, AVIA311 and AVIA314.
Hours 8 hours per week for the full year.
Examination Progressive assessment based upon written reports, seminar presentations and examination.
Content Students will prepare and present seminars which relate to their project work in terms of a review of literature and methodology. Attendance and participation is compulsory.
Tests and References To be advised.
AVIA405 AVIATION HONOURS — THESIS 40cp
Prerequisites B.Sc. (Aviation) with a Credit grade average or better in AVIA308, AVIA310, AVIA311 and AVIA314.
Corequisites AVIA401 and either AVIA403 or AVIA404.
Hours 12 hours per week for the full year.
Examination The thesis will be assessed by two Examiners one of whom may be external.
Content AVIA405 is half the Honours in Aviation. It consists of the development, conduct, analysis and reporting of a piece of original empirical research. The thesis (of about 75 pages) formally presents this research in conventional format.
Students are supervised by members of the Department of Aviation and are advised to discuss possible projects well in advance with possible supervisors. Nominated topics are submitted to a meeting of the staff of the Department of Aviation, chaired by the Head of Department, for approval.
BIOLICAL SCIENCES
BIOL401 HONOURS IN BIOLOGICAL SCIENCES 40+40cp
Prerequisites 40cp. Level 300 BIOL or other 300 level subjects approved by Department), obtaining a Credit grade average.
Content Carry out a research project and complete a thesis, essay, viva and two seminars.
CHEMISTRY
CHEM401) HONOURS IN CHEMISTRY 40+40cp
Prerequisites Completion of ordinary degree requirements and permission of the Head of Department. An average credit grade in at least four Level 300 Chemistry subjects is the normal minimum entry requirement. It will be expected that a student undertaking project work in a particular area will have completed the corresponding Level 300 core subject at a minimum of credit grade. Students intending to undertake the Honours program should notify the Head of Department of their intention by 1 November in their final undergraduate year and confirm this as soon as final examination results are known.
Content The Honours program extends over two semesters or its part-time equivalent and consists of:
1) a course of advanced lectures (approximately 50 hours) (30%)
2) a reading list in the main area of interest (30%)
3) a supervised research project, the results of which are embodied in a thesis and presented as a seminar (40%)
Examination Half each of the lecture course and the reading list will be examined at the end of semester one and the remainder at the end of the second semester. The thesis will be assessed by a committee of three (one of whom shall be the project supervisor) appointed by the Department. Part-time students will have their assessment spread accordingly over two academic years.
GEOGRAPHY
Entry to an Honours degree requires a Credit or better grade average in appropriate 300 level subjects.
GEOG401) HONOURS IN GEOLOGY 40+40cp
GEOG402
Prerequisites GEOG101 and GEOG102 plus either GEOG201 or GEOG202 or GEOG301 or GEOG302 including 30cp from 200 level and 40 cp from 300 GEOG level obtaining at least a Credit grade average.
To qualify for admission to Geography Honours, a student must normally have completed sufficient training in geographical methods (i.e. GEOG201 and GEOG301 for Physical Geography; GEOG202 and GEOG302 for Human Geography), have completed a Major in Geography that includes GEOG101, GEOG202, 10 credit points from level 200 courses and 40 credit points from level 300 courses. To proceed to Geography Honours a candidate must have obtained at least a Credit grade average in the 300 level and Geography subjects taken for the major plus at least 20 other points at credit level in their university courses. The student must also satisfy the Head of the Department of her/his ability in the area of study within which the proposed research topic lies.
Hours 8 hours per week for two semesters.
Examination External and internal examination of a research thesis, and internal assessment of the coursework.
Content A thesis embodying the results of an original investigation on a topic approved by the Head of Department and coursework as prescribed.
Note A candidate who wishes to proceed to Honours should notify the Head of Department by 1 October in the final year of the undergraduate degree and must confirm this as soon as final results for the year are known. Candidates are expected to commence work on their thesis after completion of their undergraduate degree.
GEOLOGY
GEOG401) HONOURS IN GEOLOGY 40+40cp
GEOG402
Prerequisites 40cp. Level 300 GEOG, obtaining at least a Credit grade average. For GEOG402, prerequisite of GEOG401, completion of ordinary degree requirements.
Hours To be advised.
Examination
(i) a viva voce examination
(ii) research work carried out and its presentation in a thesis
(iii) seminars, assignments

Content
Part A
Lecture-tutorial work with directed reading in the following fields of geology: mineralogy and crystallography; geochronology; igneous petrology; metamorphic petrology; coal petrology; economic geology; engineering geology. Presentation of a seminar. Not all fields will be available every year.

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

PHYSICS
PHYS401) HONOURS IN PHYSICS 404cp PHYS402
Prerequisites PHYS301 plus any other three PHYS300 subjects obtaining at least a Credit grade average.

Hours PHYS401 and PHYS402 together comprise 115 hours of lectures plus a project.

Examination As required.

Content
PHYS301 and PHYS402 are intended to give students an advanced understanding of the fundamentals of modern physics appropriate for an Honours graduate in the discipline as well as exposure to the current interests of the Department viz, solid state physics, radar meteor physics, electromagnetic signal propagation and aspects of applied physics.

These aims will be achieved by offering 3 compulsory core topics, Quantum Mechanics, Theoretical Solid State Physics and Plasma Physics, and a number of optional topics. These latter shall include Relativity, Applied Nuclear Physics, Surface Physics, Space Physics, Atomic collisions in Solids, Laser Physics, Fourier Transforms, Ionospheric Physics and Particle Detection. While all of these topics may not be offered in any year, further topics may be available depending on visitors to the department.

Tests As required.

PSYCHOLOGY
PSYC401) PSYCHOLOGY HONOURS 401 (SEMINARS) 404cp

Prerequisite A completed BA or BSc or three complete years of a BA(Psy.attr.) or BSc(Psy.attr.) including the subjects PSYC101 and PSYC102, at least 40 credit points of Psychology at the 200 level including PSYC201, and at least 60 credit points of Psychology at the 300 level including PSYC301 and PSYC302. Candidates must have obtained at least a Credit grade in each of four 300 level Psychology subjects including PSYC301 and PSYC302.

Hours 12 hours per week for the full year

Examination To be advised.

Content
PSYC401 comprises half of the final Honours in Psychology. Full-time students enrol in PSYC402 as well. Part-time students complete PSYC401 in the first year and PSYC402 in the second. PSYC401 consists of five seminar series, including one compulsory unit on theoretical issues in Psychology, a choice of two units in mathematical or physiological Psychology, and a choice of two units in applied or social Psychology. Each unit will include seminars at which attendance and participation is compulsory, and will be assessed by essay, examination, oral presentation, or a combination. The exact topics of these seminars may be replaced with a practical placement and associated essay. There is some overlap with PSYC403.

Tests and References To be advised.

PSYC402) PSYCHOLOGY HONOURS 402 (THESES) 40cp

Prerequisite A completed BA or BSc, or three complete years of a BA(Psy.attr.) or BSc(Psy.attr.) including the subjects PSYC101 and PSYC102, at least 40 credit points of Psychology at the 200 level including PSYC201, and at least 60 credit points of Psychology at the 300 level including PSYC301 and PSYC302. Candidates must have obtained at least a Credit grade in each of four 300 level Psychology subjects including PSYC301 and PSYC302.

Corequisite PSYC401

Hours 12 hours per week for the full year

Examination Thesis will be assessed independently by the supervisor and by another member, or members of the Department.

Content
PSYC402 comprises half of the final Honours in Psychology. Full-time students enrol in PSYC402 as well. Part-time students complete PSYC401 in the first year and PSYC402 in the second. PSYC402 consists of the development, conduct, analysis, and reporting of a piece of original empirical research. The thesis is a formal presentation of this research and must be in APA format. There is a limit of fifty pages. Each student will be supervised by a member of the Psychology Department. Students are strongly advised to discuss potential projects with appropriate staff members well in advance. Involvement with external agencies must be through official departmental channels.

Tests and References To be advised.
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

STAT 404 ROBUST REGRESSION AND SMOOTHING

Prerequisite: Forty credit points level 300 STAT subjects, obtaining at least a Credit grade average.

The main theme is the use of the computer to fit models to data when the assumptions of traditional models may not be satisfied or when it is not known in advance what form of model is appropriate. Topics to be covered include: concepts of robustness, L-2, M- and high breakdown estimation in linear regression, scatter plot smoothing, e.g. ACE, LOESS and splines, kernel regression and methods for choosing the amount of smoothing, and radically different approaches (e.g. CART and projection pursuit).

Text

References

STAT 405 STATISTICAL CONSULTING

Prerequisite: Forty credit points level 300 STAT subjects, obtaining at least a Credit grade average.

The aim of this course is to develop both the statistical and nonstatistical skills required for a successful consultant. The course includes a study of the consulting literature, a review of commonly-used statistical procedures, problem formulation and solving, analysis of data sets, report writing and oral presentation, role-playing and consulting with actual clients.

STAT 406 METHODS FOR QUALITY IMPROVEMENT

Prerequisite: Forty credit points level 300 STAT subjects, obtaining at least a Credit grade average.

The course will cover the concepts of total quality management, the Deming philosophy and relevant statistical techniques. Simple methods such as flow charts and Pareto diagrams will be covered, in addition to the various types of control charts and process capability analysis. Modern experimental design techniques for optimizing process performance will be included. The course is a practical one, and the issues involved in actually implementing a quality and productivity improvement program in an organization will be addressed.

Course readings provided.

STAT 407 ADVANCED TOPICS IN STATISTICS

Prerequisite: Forty credit points level 300 STAT subjects, obtaining at least a Credit grade average.

This course consists of four modules that are selected from the following topics:
- Multivariate methods; randomization, bootstrapping and other computer intensive methods; analysis of repeated measurements; sample size estimation, analyzing large datasets; meta-analyses.

STAT 408 Project (10 credit points)

Prerequisite: Forty credit points level 300 STAT subjects, obtaining at least a Credit grade average.

STAT 409 Project (20 credit points)

Prerequisite: Forty credit points level 300 STAT subjects, obtaining at least a Credit grade average.

STAT 410 Project (30 credit points)

Prerequisite: Forty credit points level 300 STAT subjects, obtaining at least a Credit grade average.

STAT 411 Project (40 credit points)

Prerequisite: Forty credit points level 300 STAT subjects, obtaining at least a Credit grade average.

COMBINED HONOURS SUBJECTS

MAT 401: Honours in Mathematics

GEOL 401 and GEOL 402

Prerequisites: Completion of ordinary degree requirements obtaining at least a Credit grade average in 40 credit points level 300 MATH/GEOL subjects and permission of the Heads of the Departments of Geology and Mathematics.

Content
At least 40 credit points chosen from those available to Honours students in Mathematics together with work equal to 40 credit points at 400 Level offered by the Department of Geology. Geology 402 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 on seminars and assignments may be required by either Department.

MAT 401: Honours in Mathematics ECON 401 and Economics

40 to 40 credit points

Prerequisites: See entry for each subject and consult the Head of both Departments.

MAT 401: Honours in Mathematics PHYS 401 and Physics

40 to 40 credit points

Prerequisites: See entry for each subject and consult the Head of both Departments.

MAT 401: Honours in Mathematics PSYC 401 and Psychology

40 to 40 credit points

Prerequisites: See entry for each subject and consult the Head of both Departments.

POSTGRADUATE AND HIGHER DEGREE SUBJECTS IN GEOGRAPHY

MASTER OF ENVIRONMENTAL STUDIES

GEOG 491 ENVIRONMENTAL STUDIES SEMINAR 1 (F.Y.)

20 credit points

Introduction to environmental assessment, management and decision making utilizing specific examples from the Hunter Region, such as waste management, total catchment management and recreational management. The second semester is devoted to the rationale and methodology of environmental impact assessment and a study of the environmental planning system.

GEOG 492 ENVIRONMENTAL STUDIES MINOR PROJECT (F.Y.)

10 credit points

Project under individual supervision required for the Diploma in Environmental Studies. The topic is determined by the student's interest and background.

GEOG 493 ENVIRONMENTAL STUDIES MAJOR PROJECT I (F.Y.)

30 credit points

One-half of the project under individual supervision required for the Master of Environmental Studies. Simultaneous enrolment with GEOG 494 is required to full time students. Part-time students may take GEOG 495 and GEOG 496 in separate years. The topic is determined by the student's interest and background.

GEOG 494 ENVIRONMENTAL STUDIES MAJOR PROJECT II (F.Y.)

30 credit points

One-half of the project under individual supervision required for the Master of Environmental Studies. Simultaneous enrolment with GEOG 493 is required to full time students. Part-time students may take GEOG 495 and GEOG 496 in separate years. The topic is determined by the student's interest and background.

ASTROPHYSICAL APPLICATIONS OF MAGNETOHYDRODYNAMICS

10 credit points

Prerequisites: Background in Calculus and Partial Differential Equations.

Examination: One 2 hour paper.

Content
The normal state of matter in the universe is that of a plasma, or ionized gas, pervaded 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.

References
Cowling, T.G. 1957, Magnetohydrodynamics, Interscience.
Dingle, R. 1987, 89.
Moffatt, H.K. 1978, Magnetic Field Generation in Electrically Conducting Fluids, CUP.
MATH502 BANACH ALGEBRA
10cp
Corequisite MATH310.
Hours About 27 lecture hours — Semester 2.
Examination One 2 hour paper.

Content
A Banach Algebra is a mathematical structure where the two main strands of pure mathematical study — the topological and the algebraic — are united in fruitful contact. The course will cover the following subject matter: Normed algebras, regular and singular elements; the spectrum of an element and its properties; the Gelfand-Phillips theorem; the spectral radius and spectral mapping theorem for polynomials; ideals and maximal ideals. Commutative Banach algebras; the Gelfand theory and the Gelfand representation theorem. Weak topologies, the Banach-Alaoglu theorem, the Gelfand topology. Involutions in Banach algebras; hermitian involutions; the Gelfand-Naimark representation theorem for commutative $B^*$ algebras. Numerical range of an element in a normed algebra; relation of the numerical range to the spectrum; $B^*$ algebras are symmetric, discussion of the Gelfand-Naimark representation theorem for $B^*$ algebras. Applications of Banach algebra theory.

Text

References

MATH504 FLUID STATISTICAL MECHANICS
10cp
Hours About 27 lecture hours — Semester 2.
Examination One 2 hour paper.

Content
Cluster-diagrammatic expansions - low density solutions; integro-diagonal equations and their applications, high density solutions; quantum liquids - Wu-Fefferman 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
Croxton, C.A. 1975, Introduction to Liquid State Physics, Wiley.

References

MATH505 FOUNDATIONS OF MODERN DIFFERENTIAL GEOMETRY
10cp
Prerequisite MATH201, MATH202 and MATH203.
Hours About 27 lecture hours — Semester 2.
Examination One 2 hour paper.

Concent

References

MATH506 HISTORY OF ANALYSIS TO AROUND 1900
10cp
Hours About 27 lecture hours — Full year.
Examination One 2 hour paper.

Content
A course on 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, magnitudes, ratio, proportion and their treatment in Elements X, XII and the works of Archimedes; development of number systems and their equivalents; scholastic mathematics; virtual motion; Renaissance quadrature/cubature - analytic geometry, Cartesian geometry, 17th and 18th century calculus; rigorization of analysis in the 19th century with stress on the developments of number systems, continuity, function concept, differentiability, integrability. 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.

References

MATH507 LINEAR OPERATORS
10cp
Prerequisite MATH310 and MATH311.
Hours About 27 lecture hours — Semester 1.
Examination One 2 hour paper.

Content
The theory of linear operators on Hilbert and Banach spaces is an important topic, particularly because of its applications to many areas of pure and applied science. We consider further aspects of normed linear space theory, the algebra of continuous linear operators on a normed linear space, the spectrum and numerical range of a continuous linear operator, and compact operators. We discuss the theory of compact linear operators and the Riesz-Schauder Theory for such operators. The course concentrates on spectral theory for different types of operator on Hilbert space: compact normal, self-adjoint and normal operators.

References

SECTION EIGHT
POSTGRADUATE SUBJECT DESCRIPTIONS
MATH509 NONLINEAR OSCILLATIONS 10cp
Prerequisite MATH104, MATH105
Hours About 27 lecture hours — Full year
Examination One 2 hour paper.

Content
Physical problems often give rise to ordinary differential equations which have oscillatory solutions. This course will be concerned with the existence and stability of periodic solutions of such differential equations, and will consider the following subjects: two-dimensional autonomous systems, limit sets and the Poincare-Bendixson theorem; Brouwer’s fixed point theorem and its use in finding periodic solutions; Non-critical linear systems; and their perturbations. The method of averaging. Frequency locking, jump phenomenon, and subharmonics. Bifurcation of periodic solutions. Attention will be paid to applications throughout the course.

References
Nayfeh, A.H. 1979, Nonlinear Oscillations, Wiley.

MATH510 PERTURBATION THEORY 10cp
Prerequisites MATH201, 203, 304.
Hours About 27 lecture hours — Semester 1.
Examination One 2 hour paper.

Content

References
Christensen, H.N. 1975, Biological Transport, W.A. Benjamin.
Margaria, R. 1976, Biomechanics and Energetics of Muscular Exercise, Clarendon.

MATH511 QUANTUM MECHANICS 10cp
Prerequisite MATH112
Hours About 27 lecture hours — Semester 2.
Examination One 2 hour paper.

Content
Operators; Schroedinger’s equation; one dimensional motion; parity; harmonic oscillator; angular momentum; central potential; eigenfunctions; spin and statistics; Rutherford scattering; scattering theory phase shift analysis; nucleon-nucleon interaction; spin-dependent interaction; operators and state vectors; Schroedinger equations of motion; Heisenberg equation of motion. Quantum molecular orbitals; hybridization; LCAO theory; MO theory.

Texts

MATH512 RADICALS & ANNIHILATORS 10cp
Prerequisite MATH112
Hours About 27 lecture hours — Full year
Examination One 2 hour paper.

Content
This topic will briefly outline the classical theory of finite dimensional algebras and the emergence of the concepts of radical, idempotents, ring, chain conditions, etc. Hopefully this will set in perspective, the next part will deal with the Artin-Jones-Jacobson ring theory and the significance of other radicals when finiteness conditions are dropped. The relations between various radicals, hopfian rings, left and right annihilators and the Golod-Shafarevich theorems will end the topic.

References
Divinsky, N. 1964, Rings and Radicals, Allen Unwin.
Hersch, J.N. 1960, Non-commutative Rings, Wiley.
Kaplansky, I. 1960, Fields and Rings, Chicago.

MATH513 SYMMETRY 10cp
Prerequisite Some knowledge of Linear Algebra.

Hours About 27 lecture hours — Semester 1.
Examination One 2 hour paper.

Content
This course studies various aspects of algebra. Matters discussed may include: invariance of lattices, crystals and associated functions and equations; permutation groups; finite geometries; regular and strongly-regular graphs; design; tactical configurations; “classical” simple groups, Matrix groups, representations, characters.

References
Dynamical Systems and Linear Algebra, Academic.
Margaria, R. 1976, Biomechanics and Energetics of Muscular Exercise, Clarendon.

MATH514 VISCOS FLOW THEORY 10cp
Prerequisite MATH506, MATH510.
Hours About 27 lecture hours — Semester 1.
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.

References

MATH515 GEOMETRICAL MECHANICS 10cp
Recommended Companion Foundations of Modern Differential Geometry.
Hours About 27 lecture hours — Semester 2.
Examination One 2 hour paper.

Content
For all but the simplest systems Lagrangian or Hamiltonian formulations of mechanics are vastly superior (albeit equivalent) to Newton’s equations. Initially the course will introduce Lagrangian and Hamiltonian formulations, and apply them to systems of particles with constraints and to rigid-body systems. The second part of the course will present the modern geometrical formulations of Lagrangian and Hamiltonian mechanics. An ab initio introduction will be given to smooth vector fields and their flows, differential forms, the tangent and cotangent bundles. Lagrangian mechanics will then be presented in terms of flows on the tangent bundle of configuration space, with Hamiltonian mechanics taking place on the cotangent bundle.

References
(And others to be advised)

MATH517 ANALYSIS OF TOPOLOGICAL STRUCTURES 10cp
Prerequisite MATH511.
Hours About 27 lecture hours — Semester 1.
Examination One 2 hour paper.

Content
A course on some aspects of group construction, which will include discussion of: presentation of a group by generators and relations; presentation of a group as a group of permutations, and as a symmetry group or structure-preserving group, relations between groups and some geometrical objects; representation of a group as a group of matrices; construction of groups in various ways from known groups; constructions preserving variational and categorical properties; construction of “generalising” groups of certain classes.

References
Fels, W.J. 1969, Characters of Finite Groups, Benjamin.
Tritt & ed. K.A. Harris, and other articles and books mentioned during the course.

MATH518 ANALYSIS OF TOPOLOGICAL STRUCTURES 10cp
Prerequisite MATH510.
Hours About 27 lecture hours — Semester 1.
Examination One 2 hour paper.
SECTION EIGHT

POSTGRADUATE SUBJECT DESCRIPTIONS

Content

A topological space is the most basic structure for analysis study. We develop separation axioms, including Urysohn's Lemma, countable base properties, product and quotient topologies, compactness and Tychonoff's Theorem. To link to metric spaces we outline the basic metrisation theorem. We then study linear topologies and their special properties, local bases and locally convex topologies, the metrisation and normality theorems. Glaeser and Polars. The Hahn Banach Separation Properties are developed. The theory is applied to the study of weak topologies on Banach spaces, the Banach--Alaoglu Theorem and Goldstone Theorems.

References

Jameson, G.J.O. 1974, Topology and Normed Spaces, Chapman & Hall.

MATHS18 LIE GROUPS AND ALGEBRAS WITH APPLICATIONS TO DIFERENTIAL EQUATIONS 10cp

Prerequisite MATH304.

Hours Approximately 27 lecture hours — Semester 1.

Examination One 2 hour paper.

Content


MATHS19 GENERAL RELATIVITY 10cp

Recommended Companion Foundations of Modern Differential Geometry.

Hours Approximately 27 lecture hours — Semester 1.

Examination One 2 hour paper.

Content

This topic presents an introduction to general relativity - the current theory of gravitation. The subject will be presented using methods of modern differential geometry. Relativity may be (and will be) regarded as a special application of pseudo-Riemannian geometry, where the manifold, here space-time, has a metric that is not positive definite.

Particles, fluids and electromagnetic fields will be introduced into arbitrary space-times. It will then be shown how these sources of "matter" can generate the geometry of space-time via Einstein's field equations. Applications of the theory will include introductions to black holes and to relativistic cosmology.

References


Others to be advised.

MATHS20 C* - ALGEBRAS 10cp

Hours About 27 lecture hours — Semester 1.

Examination One 3 hour paper.

Content

The object of the course is to explain the basic properties of C*-algebras, and to see some of the ways they arise in different areas of mathematics. We aim to minimise the technical background required, and to assume only a very basic background in functional analysis.

We start with a brief look at the more general Banach algebras, where we discuss the basic properties of the spectrum, and the Gelfand transform, which embeds commutative Banach algebras in an algebra of continuous functions. The Gelfand–Naimark theorem says that, when the algebra is a C*-algebra, the Gelfand transform is an isomorphism, and we shall look at this theorem and its applications in operator theory. We shall then discuss representations of C*-algebras — roughly speaking, the ways of realising an abstract C*-algebra as an algebra of operators on Hilbert space. There is a general construction which shows this can always be done — due to Gelfand, Naimark and Segal — but we shall focus on the way in which C*-algebras are used in the representation theory of groups and dynamical systems.

References


MATHS21 CLIFFORD ALGEBRAS AND SPINORS 10cp

Hours Approx. 27 hours — Full Year.

Examination One 2 hour paper.

Content

Clifford called the algebras that now bear his name "geometrical algebras". This is because these algebras are tailored to the geometry of an orthogonal space. These algebras are a vehicle for the study of the (pseudo) orthogonal groups and their simply connected covers the Spin groups.

The Clifford algebras are useful examples of associative linear algebras. They will be used as a paradigm in the study of such algebras. The course will include Weyl's structure theorem for semi-simple associative algebras and Frobenius' theorem for real division algebras.

The orthogonal and Spin groups will provide concrete examples of Lie groups. Their representations will be studied. In particular the irreducible representations of the various Spin groups, the spinor representations, will be classified.

Reference


Others to be advised.

MATHS22 INTRODUCTION TO CATEGORY THEORY 10cp

Examination One 2 hour paper.

Content

This course is geared to an examination of the concept of "naturality" in mathematics. Categories and functors will be introduced as unifying concepts underlyng much of mathematics. Some connections with, and applications to Computer Science will be explored. Adjoint Functors will be discussed in some depth and illustrated by applications to various branches of mathematics, particularly group theory. The existence of adjoint functors under certain conditions and a monadic approach to universal algebras will end the course.

Text

MacLane, S. 1971, Categories for the Working Mathematician, Springer.

References


MATHS23 GREEK MATHEMATICS AND ITS HISTORY 10cp

Examination One 2 hour paper.

Content

An in-depth study of Greek mathematics from about 500BC to 500AD. There will be 27 lectures. In addition students will be expected to read, in translation, substantial parts of original works and to interpret and comment upon those works verbally and in writing. Links with the mathematics of other cultures will also be explored.

MATHS24 DEVELOPMENT OF CONTEMPORARY ALGEBRA 10cp

Examination One 2 hour paper.

Content

This course of 27 lectures will examine what mathematics can be considered "algebraic" and how it has developed from Babylonian times to about 1930. It will concentrate on those streams which appear to have had a bearing on the present state of the subject rather than on interesting side-shoots. Considerable use will be made of source material (mostly in English translation).

Hours Full year.

Assessment The course will be assessed by essays and seminars.

MATHS25 ADVANCED TOPIC IN ANALYSIS 10cp

Prerequisite MATH110

Examination One 2 hour paper.

Content

This will usually be a choice of one of the following.

Operator Theory: Linear operators on Hilbert and general Banach spaces will be studied. The course will largely concentrate on spectral theory, in particular for compact and compact normal operators.

References


Fixed Point Theory and Applications: The basic theorems of Brouwer, Schauder--Tychonoff, Kakutani and Leray--Schauder degree theory will be developed, extended and applied.

References


The Geometric Theory of Banach Spaces: The contents will include: reflexivity, dualities between convexity and smoothness, the external structure of convex sets, basic sequences, superreflexivity, renormings and the theory of Type.

References


The choice of Topic may vary from year to year, in part based on student interests.
MATH526 MODELS OF BIOLOGICAL PATTERN FORMATION 10cp

Prerequisites MATH201, MATH202, MATH203, MATH213, MATH315.

Hours About 27 lecture hours — Full Year.
Examination One 2 hour paper

Content

In 1952, Turing suggested that, under certain conditions, chemicals can react and diffuse in such a manner as to produce steady state heterogeneous spatial patterns of chemical or "morphogen" concentration. This topic will discuss a number of models of pattern generation which lead to a system of reaction-diffusion equations. These will be analyzed in detail and the conditions under which patterns are likely to occur will be characterized.

References
Murray, J.D. 1989, Mathematical Biology, Springer.

 SUBJECT COMPUTER NUMBERS

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