Faculty of Engineering

Volume 8    1993
The University of Newcastle

Faculty of Engineering
Handbook
The University of Newcastle Calendar consists of the following volumes:

Volume 1: Legislative
Volume 2: University Bodies and Staff
Volume 3: Faculty of Architecture Handbook
Volume 4: Faculty of Art, 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

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

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The colour band, Lapis Lazuli BCC 150, on the cover is the lining colour of the hood of Bachelors of Engineering of this University.

The information in this Handbook is correct as at 8th October 1992.

ISSN 0159-3455

Recommended Price: Five dollars and fifty cents plus postage.

Designed by: Marie-T Wisniowski
Typeset by: Jan Spurr, The Secretariat Division, The University of Newcastle
Printed by: Newcastle Camera Print
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THE DEAN’S FOREWORD

On behalf of the staff of the Faculty of Engineering, I wish to extend a welcome to all students, those who are entering the University and the Faculty for the first time and those who are returning to commence another year of studies.

Having chosen to study in one of the fields of Engineering, Computer Science or Surveying, you are embarking on a professional career which is both challenging and stimulating. We are living in an age which is witnessing a tremendous growth in scientific and technological development and which is having a marked effect on the modes and characteristics of our society. The future of our society is very much dependent on the solution of a number of very complex technological problems. While these problems will be many and varied, none will be more important than those associated with food production, the development of alternative forms of energy and the preservation of our living environment. Graduates in the various disciplines of Engineering and of Computer Science and Surveying, will, in their own way, contribute to the solution of these and other important problems.

On behalf of the staff of the Faculty of Engineering, I wish to extend a welcome to all students, those who are entering the University and the Faculty for the first time and those who are returning to commence another year of studies. Having chosen to study in one of the fields of Engineering, Computer Science or Surveying, you are embarking on a professional career which is both challenging and stimulating. We are living in an age which is witnessing a tremendous growth in scientific and technological development and which is having a marked effect on the modes and characteristics of our society.

The role of universities in modern society has broadened. Not only is it necessary to preserve the ideals of learning and associated fundamental research, it has become of equal importance for universities to become directly involved in the application of research to the solution of problems associated with industry and the community. For this reason, the role of a university engineering faculty in applied and industrially orientated research is an important one. In this respect it is noteworthy that this Faculty of Engineering, through its research and associated projects undertaken on behalf of Australian industry, is making a major contribution and has attained national and international prominence. The interaction between the research and teaching functions is invaluable to the maintenance of standards and the professional relevance of course curricula.

Alan W. Roberts
Dean
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Faculty Information

About This Section
This section contains general information about the Faculty of Engineering and the courses which are offered within that Faculty. Relevant University Rules and Course Programs are given in separate sections of this Handbook.

Advice and Information
Students are assumed to be familiar with the information contained in this Handbook which relates to their own course of study and to general University and Faculty requirements.

Additional information will be posted on Notice Boards throughout the academic year. It is each student's responsibility to ensure that they keep themselves aware of the contents of relevant Notice Boards.

As course and University requirements do not remain static, students are advised to purchase a copy of the Faculty Handbook annually in order to become aware of changes and to retain those Handbooks so as to provide a record of the content studied.

Course and Enrolment Enquiries
Enquiries regarding course requirements and general matters such as University Rules and procedures, Faculty policies, admission, enrolment and re-enrolment, variations of program and course transfer may be directed to the Faculty Office - call at Room EA206 or telephone (049) 21 6065.

Academic Advice

Academic advice and general information about the content of particular courses may be obtained from the relevant Head of Department or from the Course Coordinator of the relevant course.

Personal Counselling

Students may wish to discuss matters relating to course difficulties or options with the Faculty Secretary, other Faculty Office staff or the relevant Course Coordinator.

Members of the University Counselling Service are also available for entirely confidential personal consultation on any matter, particularly matters of academic skills and personal growth. The Counselling Service is situated on the courtyard level of the Library Building. An appointment is usually required.

Students with Special Needs

Students with disabilities may wish to consult the Faculty's Adviser for Students with Special Needs, Dr D.H. Wood of the Department of Mechanical Engineering, top Floor, D.W. George Building. Telephone 216200 for an appointment.

The Faculty

The Faculty of Engineering is constituted by the Council of the University and consists of the Department of Chemical Engineering, the Department of Civil Engineering and Surveying, the Department of Computer Science, the Department of Electrical and Computer Engineering and the Department of Mechanical Engineering.

The Faculty Board, Faculty of Engineering, is charged with conducting the academic affairs of the Faculty. Membership of the Faculty Board includes the Vice-Chancellor (ex officio), the Director of the School of Engineering, the Dean of the Faculty, the members of the full-time academic staff of the departments comprising the Faculty, representatives of a number of other faculties and departments of the University, and four student members. The Dean is Chairman and executive officer of the Faculty Board.

Degrees and Diplomas

The awards which may be currently made by the University to persons presented by the Faculty of Engineering are listed below.

Bachelor Degrees

Bachelor of Computer Science (BCompSc)
Bachelor of Computer Science (Honours) (BCompSc(Hons))
Bachelor of Engineering (BE), which may be awarded as a pass or honours degree, is awarded in the specialisations of:

- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Environmental Engineering
- Industrial Engineering
- Mechanical Engineering

Bachelor of Surveying (BSurv), which may be awarded as a pass or honours degree.

Graduate Diplomas

Graduate Diploma in Computer Science (GradDipCompSc)
Graduate Diploma in Computing (GradDipComp)
Graduate Diploma in Surveying (GradDipSurv)

Higher Degrees by Coursework

- Master of Computing (MComp)
- Master of Engineering Science (MEngSc)

Higher Degrees by Research

- Master of Computer Science (MCompSc)
- Master of Engineering (ME)
- Master of Science (MSc)
- Doctor of Engineering (DEng)
- Doctor of Philosophy (PhD)
- Doctor of Science (DSc)

Bachelor Degree Courses

General information regarding the bachelor degree programs offered in the Faculty is provided below. The detailed Course Programs appear in Section 5 of this Handbook.

Computer Science

The Bachelor of Computer Science (BCompSc) degree course has been designed to equip students with an excellent background for a professional career in the computer industry or as a programmer or systems analyst in industry or commerce.

The course program meets the highest academic requirements for membership of the Australian Computer Society (ACS).

The BCompSc program may be completed by three years of full-time study or part-time equivalent. Combined degree programs are also available (see below).

Honours in Computer Science

The Bachelor of Computer Science (Honours) degree is a separate degree program which may be taken full-time over one year or part-time over two years. Candidates for this degree have normally completed the BCompSc program with a creditable performance, however, graduates in other disciplines with a substantial background and a creditable performance in computer science may be considered for admission.

Engineering

Bachelor of Engineering (BE) degree courses are offered in the following specialisations:

- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Environmental Engineering
- Industrial Engineering
- Mechanical Engineering

Each engineering degree program may be completed by four years of full-time study or equivalent. Part-time attendance is permitted, however, students intending to undertake part-time study should note that many classes are held during the day. Students may choose to combine years of full-time study with years of part-time study at their own discretion. It is also possible to follow a 'block sandwich' pattern of attendance by which full-time study and full-time industrial experience are undertaken in alternate years. It is recommended that at least the final year of study be taken on a full-time basis.

Engineering courses are highly structured and, although each follows a similar pattern, the content of the courses naturally differs according to the needs of the specialty concerned.

In Year I students study mathematics and the basic sciences as well as computer science and a creditable performance in computer science and a creditable performance in computer science may be required. Each year of study be taken on a full-time basis.

In Year II students focus on the basic sciences and a creditable performance in computer science and a creditable performance in computer science may be required. Each year of study be taken on a full-time basis.

In Year III, students undertake extensive studies in an area of special interest, a particular feature of engineering programs at Newcastle.

Engineering programs are regularly reviewed in order to incorporate the latest technological and professional developments relevant to each specialty. The current Course Programs are set out in Section 5 of this Handbook.

In addition to the full degree programs offered in the Faculty, students may commence studies in Mining Engineering and Naval Architecture by completing the first two years of the full
programs in Civil Engineering or Mechanical Engineering respectively. Students choosing to follow these programs may complete their studies at the University of New South Wales.

Honours

Awards of honours are made on the basis of performance during the entire course program (see Faculty Policies in Section 4). There is no separate 'honours year'.

Accreditation

Each engineering program (other than the new Environmental Engineering program) is accredited as meeting the full academic requirements for corporate membership of the Institution of Engineers, Australia (IIAUS) and recognized by a number of overseas professional bodies. The Environmental Engineering program has received preliminary accreditation and it is confidently expected to be fully accredited in accordance with the normal accreditation process.

The Computer Engineering Program is also accredited by the Australian Computer Society (ACS) as satisfying that organization's highest level of academic requirements.

The Chemical Engineering program also meets requirements for membership of the Institution of Chemical Engineers (Glasgow) and is recognized by the Royal Australian Chemical Institute and the Australian Institute of Energy.

Surveying

The Bachelor of Surveying (B(Surv)) program is offered as a four year full-time or equivalent study course on a similar basis to that of engineering programs. In addition to Mathematics and Physics, the course also deals with the theory and practice of surveying, together with aspects of geography, geodesy, surveying and geographic surveying.

The course meets the academic prerequisites for an application for registration under the Surveyors Act, 1929 (as amended). In order to become a Registered Surveyor in NSW it is necessary for a graduate to meet other requirements of the Board of Surveyors of NSW. Requirements on this aspect should be directed to the Registrar of the Board of Surveyors of NSW. Registration is required only if practice as a land surveyor is intended; many surveying careers do not require registration.

The combined BE (Civil Engineering) / B(Surv) degree program, a recent innovation, is intended to be unique to the University of Newcastle, allows completion of the two professional qualifications by 5 years of full-time study. The program is entered after completion of the first year of either course with a WAM of 55 or more.

Combined Degree Programs

A number of combined degree programs are available which lead to the award of a two degrees by a total of five years of full-time study for programs which include BE and four years of full-time study for BCompSc/BMath and BCompSc/BSc programs. The programs listed below have been either approved or have been submitted for approval by the relevant Faculty Boards. Other combined programs may be approved to meet the needs of individual cases. Information on the availability of combined programs may be obtained from the Combined Degree Coordinator or from the Faculty Office.

- BCompSc/BMath
- BCompSc/BSc (Chemistry Major)
- BCompSc/BSc (Physics Major)
- BCompSc/BSc (Psychology Major)
- BE(Civil Engineering)/BSc
- BE(Civil Engineering)/BMath
- BE(Computer Engineering)/BCompSc
- BE(Computer Engineering)/BMath
- BE(Computer Engineering)/BSc (Physics Major)
- BE(Computer Engineering)/BChemSc
- BE(Computer Engineering)/BMath
- BE(Diploma in Computer Science)
- BE(Industrial Engineering)/BCompSc
- BE(Industrial Engineering)/BMath
- BE(Mechanical Engineering)/BMath
- BE(Surveying) / BMath

Direct admission to most of the above programs may be gained through UAC by persons who achieve highly at the NSW HSC examination (or equivalent academic performance).

Combined degree programs may also be entered after completion of the first year of the relevant engineering or computer science program with an average of credit or weighted average mark (WAM) of 70. In the case of the BE (Civil Engineering)/B(Surv) program, a WAM of 55 after completion of the first year of either of the associated programs is sufficient for admission to the program. Students intending to transfer to a combined program must contact the Faculty Office to obtain application forms for lodgment by the date required for lodgment of re-enrolment applications.

Undergraduate Scholarships

The scholarships listed below are expected to be offered in 1993.

BHP Scholarships in Computer Engineering

A number of scholarships are awarded annually to students enrolled in the Computer Engineering program. The scholarships provide a living allowance of approximately $7,000 per annum and a book allowance.

Frank Henderson Scholarships in Civil Engineering

Four scholarships are awarded annually to first year students enrolled in the Civil Engineering program. The scholarships provide a living allowance of approximately $5,000 for one year only. No application is necessary.

Industry Scholarships in Engineering

In 1992 three scholarships were offered by industry to support full-time study in specified courses. These were:

- Shortland Electricity - Electrical Engineering
- ICXI Explosives - Mechanical Engineering
- Woodruff and Co - Mechanical Engineering

Graduate Programs

Graduate Diploma in Surveying

The Graduate Diploma in Surveying is a postgraduate course designed to broaden and further the education of the practising surveyor. It may also be suitable to enable persons holding overallications in surveying to surveying not presently recognized as being sufficient to meet the academic requirements for professional recognition in Australia to meet those requirements.

Recent technological changes have significantly altered the role and operational techniques of surveyors. Many items of equipment and computational methods now in use were unknown ten to fifteen years ago. The course has a twofold objective. Primarily, it has been designed as a bridging course for surveyors with the professional qualification of the Reciprocating Surveyors Institutions of Australia and New Zealand. University degree courses in surveying were not available when these surveyors completed their examinations. In this case, the aim is to broaden the candidate's basic training with the offer of study in a wider range of disciplines which have important applications in some fields of surveying.

The Diploma program is normally completed by at least two years of part-time study, although in special cases approved by the Faculty Board, the program may be completed in one year on a full-time basis.

Master of Computing

This postgraduate course masters degree program requires two years of full-time (or the equivalent part-time) study. In addition to coursework at 400 level, candidates complete a very substantial one-year research related project which is usually associated with one of the research projects being carried out in the Department of Computer Science.

Applicants for the Master of Computing degree from graduates who have completed the Bachelor of Computer Science or its equivalent (including the Graduate Diploma in Computer Science).

Master of Engineering Science - Industrial Systems

The Master of Engineering Science is coursework program with major project. A specialist program in Industrial Systems is currently available on a part-time, condensed teaching basis. The program is intended to provide graduate engineers with the opportunity to update their knowledge in areas relevant to their professional responsibility. Please refer to the course outline in Section Seven of this Handbook.

Higher Degrees by Research

Master of Computer Science

The Master of Computer Science is a research degree by thesis, requiring an original contribution to knowledge in the area of computer science. All applications are expected to hold
SECTION TWO

Master of Engineering

The Master of Engineering is a research degree by thesis. Relevant coursework may be undertaken in association with the research program. The quality and standard of work required in the thesis is substantially higher level than that expected of a Bachelor of Engineering honours graduate. Candidates who enrol initially in the MIE program may later transfer into the PhD program if their work is of an exceptional quality.

Master of Science

This degree is similar to the Master of Engineering degree but is usually taken by students with a non-engineering background or students who are carrying out research in science areas related to engineering.

Master of Surveying

The Master of Surveying is a research degree by thesis. Coursework will not normally be included in the program. The quality and standard of work required in the thesis is substantially higher level than that expected of a Bachelor of Surveying honours graduate. Candidates who enrol initially in the MSurv program may later transfer into the PhD program if their work is of an exceptional quality.

Doctor of Philosophy

Doctoral research programs are available within each of the Departments of the Faculty. Initial enquiries regarding these programs and areas of specialised research activity currently undertaken within Departments may be addressed to the Head of the relevant department.

Enquiries regarding scholarships, the formal requirements for the degree and admission procedures should be addressed to:

The Academic Registrar,
The University of Newcastle,Callaghan, NSW
AUSTRALIA 2308

Centre for Industrial Control Science

The Centre for Industrial Control Science (CICS) was established in 1988 under the Special Research Centre scheme of the Australian Government and is closely linked to the Department of Electrical and Computer Engineering. Additional support is provided by the University and Industry.

The work of the Centre is conducted on two parallel streams. One dealing with theoretical issues in systems science and the other with the design of industrial control and signal processing systems. The aim of the Centre is to establish a true synergism between theoretical work and practical applications of control science, particularly in the areas of process control and automation.

The area of control systems design brings basic theoretical ideas in the understanding of nonlinear systems, estimation and information theory together with the associated technologies of computing, communications and industrial electronics.

In addition to the staff of the Centre, a number of the members of the academic staff of the Department of Electrical and Computer Engineering are involved with the work of the Centre, as are some 30 postgraduate students. Visiting academics and postdoctoral fellows also contribute to the work of the Centre.

Further information regarding the work of the Centre may be obtained from:

The Director,
Centre for Industrial Control Science,
Department of Electrical and Computer Engineering,
The University of Newcastle,
Callaghan, NSW
AUSTRALIA 2308

AWARD RULES

About This Section

This section contains the University Rules regarding the Bachelor Degrees and Graduate Diplomas offered in the Faculty of Engineering. The approved Course Programs referred to in the Degree schedules appear in Sections 5 and 7 of this handbook.

Rules Governing Academic Awards

Application of Rules

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

Interpretation

2. (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.

Admission

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

Subjects

4. (1) For the purposes 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.
Section Three

Enrolment

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

(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.

Pre-requisites and Co-requisites

6. (1) The Faculty Board on the recommendation of the Head of the Department may prescribe pre-requisites and/or co-requisites for any subject offered by the 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 pre-requisites 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 co-requisites.

(3) Except with the permission of the Dean, a candidate will not have satisfied a pre-requisite if the pre-requisite 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 pre-requisite purposes.

Credit

7. (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 or additionally as may be provided in the schedule.

(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.

Subject Requirements

5. (1) The subjects which may be completed in the course for the Award shall be those approved by the Faculty Board and published annually in the Approved Subjects section of 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.

Withdrawal

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

Leave of Absence

10. (1) Subject to any provision in the schedule, a candidate in good academic standing in the course:
   (a) may take leave of absence of one year from the course; or
   (b) with the permission of the Dean, may take leave of 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 and with full credit in all subjects successfully completed prior to the period of leave.

(2) For the purposes of sub-rule (1), unless otherwise specified in the schedule, a candidate eligible to re-enrol shall be deemed to be in good academic standing.

SCHEDULE I: BACHELOR OF ENGINEERING

Specialisations

1. The Degree may be offered in one of the following specialisations:
   - Chemical Engineering
   - Civil Engineering
   - Computer Engineering
   - Electrical Engineering
   - Environmental Engineering
   - Industrial Engineering
   - Mechanical Engineering

2. For the purposes of this Schedule, the designated Department with respect to each specialisation shall be:
   - Department of Chemical Engineering
   - Department of Civil Engineering and Surveying
   - Department of Computer Engineering
   - Department of Electrical Engineering
   - Department of Environmental Engineering
   - Department of Mechanical Engineering

Qualification for the Award

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

(2) A subject which has been counted towards a completed award may not be counted towards another award, except to such extent as the Faculty Board may approve.

Combined Degree Programs

12. (1) There shall be two classes of Honours, namely Class i. Class II shall consist of subjects totalling not less than 320 credit points approved by the Faculty Board on the recommendation of the Head of the designated department and include:
   (a) at least 60 credit points from 400 level subjects;
   (b) at least 60 credit points from 200 level subjects;
   (c) at least 60 credit points from 300 level subjects; and
   (d) at least 40 credit points from 400 level subjects.

Grading of the Degree

4. (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) The degree shall be conferred with Honours, namely Class I and Class II. Class II shall have two divisions, namely Division 1 and Division 2.

Enrolment

5. A candidate may not enrol in any year in a combination of subjects which is incompatible with the requirements of the Faculty Board for the particular specialisation.

Pre-requisites and Co-requisites

6. Where the result for a subject is expressed as a mark, a candidate shall have met the requirements of Rule 6(2) of the Rules Governing Academic Awards by achieving a mark of 45 or more in all subjects specified as pre-requisites or co-requisites.

Credit

7. Credit may be granted for up to 160 credit points except that a candidate may be granted such credit as the Faculty Board determines for subjects completed in the University which have not already been counted towards an award.

Transfer Between Specialisations

8. The Faculty Board may make conditions with respect to the transfer of candidate from one specialisation in the degree to another.

Additional Specialisations

9. A person who has satisfied the requirements for admission to the degree in one specialisation may be admitted to candidate in any other specialisation on such conditions as the Faculty Board may prescribe. Upon completing the requirements for
SECTION THREE

AWARD RULES

Qualification for the Award

1. To qualify for admission for the degree a candidate shall complete, to the satisfaction of the Faculty Board, a course program consisting of subjects totalling not less than 320 credit points approved by the Faculty Board on the recommendation of the Head of the Department of Civil Engineering and Surveying, including:

(a) at least 80 credit points from 100 level subjects;
(b) at least 60 credit points from 200 level subjects;
(c) at least 60 credit points from 300 level subjects; and
(d) at least 40 credit points from 400 level subjects.

SCHEDULE 2: BACHELOR OF SURVEYING

Qualification for the Award

1. To qualify for admission for the degree a candidate shall complete, to the satisfaction of the Faculty Board, a course program consisting of subjects totalling not less than 240 credit points approved by the Faculty Board on the recommendation of the Head of the Department of Computer Science, including:

(a) at least 80 credit points from 100 level subjects;
(b) at least 60 credit points from 200 level subjects;
(c) at least 40 credit points from 300 level subjects; and
(d) at least 40 credit points from 400 level subjects.

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 may be conferred with Honours.

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

Enrolment

1. A candidate may not enrol in any year in a combination of subjects which is incompatible with the requirements of the Faculty Board.

Pre-requisites and Co-requisites

1. Where the result for a subject is expressed as a mark, a candidate shall have met the requirements of Rule 6(2) of the Rules Governing Academic Awards by achieving a mark of 45 or more in all subjects specified as pre-requisites or co-requisites.

Credit

1. Credit may be granted for up to 160 credit points except that a candidate may be granted such credit as the Faculty Board determines for subjects completed in the University which have not already been counted towards an award.

SCHEDULE 3: BACHELOR OF COMPUTER SCIENCE

Qualification for the Award

1. To qualify for admission for the degree a candidate shall complete, to the satisfaction of the Faculty Board, a course program consisting of subjects totalling not less than 240 credit points approved by the Faculty Board on the recommendation of the Head of the Department of Computer Science, including:

(a) at least 80 credit points from 100 level subjects;
(b) at least 60 credit points from 200 level subjects;
(c) at least 40 credit points from 300 level subjects; and
(d) at least 40 credit points from 400 level subjects.

Enrolment

1. A candidate may not enrol in any year in a combination of subjects which is incompatible with the requirements of the Faculty Board.

Pre-requisites and Co-requisites

1. Where the result for a subject is expressed as a mark, a candidate shall have met the requirements of Rule 6(2) of the Rules Governing Academic Awards by achieving a mark of 45 or more in all subjects specified as pre-requisites or co-requisites.

Credit

1. Credit may be granted for up to 160 credit points except that a candidate may be granted such credit as the Faculty Board determines for subjects completed in the University which have not already been counted towards an award.

SCHEDULE 4: BACHELOR OF COMPUTER SCIENCE (HONOURS)

Admission to Candidate

1. An applicant for admission to candidacy shall have satisfied the requirements for admission to:

(a) the degree of Bachelor of Computer Science; or
(b) a degree of Bachelor in the University, or another university approved for this purpose by the Faculty Board.

(2) The Head of the Department of Computer Science shall, after considering an applicant's previous academic performance in relevant studies, make recommendations to the Faculty Board as to the applicant's suitability for admission to candidacy.

(3) The Faculty Board after taking into account the recommendation of the Head of the Department of Computer Science shall either:

(a) approve admission to candidacy; or
(b) approve admission to candidacy subject to the applicant completing, to the satisfaction of the Faculty Board, such prerequisite and/or co-requisite studies as it may prescribe; or
(c) reject the application.

Grading of the Degree

1. The Faculty Board shall, on the recommendation of the Head of the Department of Computer Science, determine the grade of Honours to be awarded to a candidate upon qualifying for admission to the degree.

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.

Qualification for the Award

3. To qualify for admission to the degree a candidate shall pass the program of subjects approved by the Faculty Board on the recommendation of the Head of the Department of Computer Science totalling not less than 80 credit points.

4. Credit may be granted for all subjects completed in this University which have not already been counted towards a completed award.

SCHEDULE 5: GRADUATE DIPLOMA IN COMPUTER SCIENCE

Admission to Candidate

1. In order to be admitted to candidacy for the award, the applicant shall:

(a) have completed the requirements for admission to a degree in the University; or
(b) have completed the requirements for admission to a degree at any other institution recognised by the Faculty Board; and hold such other qualifications approved by the Faculty Board for the purpose of admission to candidacy.

Qualification for the Diploma

2. To qualify for admission to the degree a candidate shall pass the program of subjects approved by the Faculty Board on the recommendation of the Head of the Department of Computer Science totalling not less than 80 credit points.

Grading of the Diploma

3. The diploma shall be awarded 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.

Credit

4. (1) Credit shall not be granted for studies which have been counted towards a completed award.

(2) Credit granted for studies completed at another institution which did not qualify a candidate for an award shall be limited to 40 credit points.

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

5. Candidates shall not be entitled to take Leave of Absence from the course.

Time Requirement

6. Except with the permission of the Faculty Board, a candidate shall complete the requirements for the award of the Diploma in not less than one and not more than five calendar years from the date of first enrolment in the course.

SCHEDULE 6: GRADUATE DIPLOMA IN COMPUTING

Admission to Candidate

1. In order to be admitted to candidacy for the award, the applicant shall:

(a) have completed the requirements for admission to a degree in the University of Newcastle; or
(b) have completed the requirements for admission to a degree at any other institution recognised by the Faculty Board; and hold such other qualifications approved by the Faculty Board for the purpose of admission to candidacy.
SECTIO:

Qualification for the Diploma
2. To qualify for admission to the degree a candidate shall pass
the program of subjects approved by the Faculty Board on the
recommendation of the Head of the Department of Computer
Science totalling not less than 80 credit points.

Grading of the Diploma
3. The Diploma shall be awarded 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.

Credit
4. (1) Credit shall not be granted for studies completed which
qualified the candidate for an award.
(2) Credit granted for studies completed at another institution
which did not qualify a candidate for an award shall be
limited to 40 credit points.
(3) Credit may be granted for all subjects completed in this
University which have not already been counted towards
a completed award.

Leave of Absence
5. Candidates shall not be entitled to take Leave of Absence
from the course.

Time Requirement
6. Except with the permission of the Faculty Board, a candidate
shall complete the requirements for the award of the Diploma
in not less than one and not more than five calendar years from
the date of first enrolment in the course.

SCHEDULE 7: GRADUATE DIPLOMA IN
SURVEYING

Admission to Candidature
1. In order to be admitted to candidacy for the award, the
applicant shall:
(a) have completed the requirements for admission to a
degree in the University of Newcastle; or
(b) have completed the requirements for admission to a
degree at any other institution recognised by the Faculty
Board; or
(c) have registration as a Land Surveyor or hold a Certificate
of Competency issued by any of the Boards of Surveyors
of Australia or New Zealand; or
(d) hold such other qualifications approved by the Faculty
Board for the purpose of admission to candidacy.

Course Program
2. The course program for the diploma shall comprise subjects
totalling not less than 80 credit points approved by the Faculty
Board on the recommendation of the Head of the Department
of Civil Engineering and Surveying.

Qualification for the Diploma
3. To qualify for admission to the diploma a candidate shall
complete the requirements of the course program to the
satisfaction of the Faculty Board.

Grading of the Diploma
4. The Diploma shall be awarded 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.

Credit
5. (1) Credit shall not be granted for studies completed which
qualified the candidate for an award.
(2) Credit granted for studies completed at another institution
which did not qualify a candidate for an award shall be
limited to 40 credit points.
(3) Credit may be granted for all subjects completed in this
University which have not already been counted towards
a completed award.

Leave of Absence
6. Candidates shall not be entitled to take Leave of Absence
from the course.

FACTOR POLICYs

About This Section
This section contains Faculty Policies which are relevant to all
students enrolled in coursework programs within the Faculty and
are to be read in conjunction with the relevant Course Programs
and Award Rules.

Students should note that Faculty Policies do not remain static.
Students are expected to consult Faculty and Departmental
notice boards regularly in order to make themselves aware of any
proposals or decisions which may affect them. Enquiries regarding
Faculty Policy may be directed to the Faculty Office.

General Course Policies and Information
The information given below should be read in conjunction with
the Rules Governing Academic Awards and the relevant Schedule
for those Rules together with other University requirements and
Faculty policies.

It is the responsibility of students to ensure that they enrol in a
program which meets currently applicable course requirements.
Where approval of a Head of Department or Course Coordinator
is required, this should be gained prior to submitting a Variation
of Program Form and be attached to that form.

Advice on course requirements and procedures is available from
the staff of the Faculty Office - Enquiries to Room EA206, or
from the relevant Course Coordinator.

Credit Points
1. The credit point value of a subject is intended to give a general
indication of the total time required of a student undertaking
that subject. The normal annual workload of 80 credit points
may be taken to indicate that the total workload of an average
student working at pass level is approximately 48 hours per
week. Thus a 5 credit point subject offered over one semester
may be taken to indicate a minimum average workload
requirement of 6 hours per week which includes course
contact hours plus time spent by the student on assignments
and other set work as well as general study of subject content.
The ratio between contact hours and private study will vary
between subjects according to the nature of the content
studied.

2. The number of hours per week required by individual students
will vary according to many factors including: academic
background, personal ability, work/study techniques and the
level of performance the student wishes to attain in a particular
subject. The general indication of 2 hours per week for each
credit point in a semester subject is a guide to the minimum
expectations of the Faculty students will need to monitor and
evaluate their own performance in the light of this expectation
and the results they obtain in particular subjects.

Timetable
3. Course programs are specified and timetabled by year.
4. Every effort will be made to provide for single day release
attendance patterns in the first two part-time stages of each
course. Timetable requirements may restrict selection of
subjects in non-standard programs.

5. Students are not to enrol in subjects which clash in the
timetable.

Prerequisites and Co-requisites
6. In addition to the subject prerequisite and co-requisite
requirements of individual subjects, a general understanding
of the material in previous years of the course is assumed.
SECTION FOUR

FACULTY POLICIES

7. Students must satisfy the relevant prerequisite and corequisite requirements in each subject unless granted a written waiver of these requirements by the Head of the Department responsible for offering the subject. Students wishing to obtain such a waiver should make application at the scheduled Re-enrolment Approval Sessions in February. If requesting a variation of enrolment at another time, the relevant form should be obtained from the Faculty Office before making an appointment to see the Head of Department to discuss the proposed waiver.

8. Only in exceptional circumstances will prerequisite and corequisite requirements be waived for students who have a WAM of 54 or less.

Adjusting Second Semester Enrolment

9. Enrolment in second semester subjects which require completion of first semester subjects to meet prerequisite, corequisite or assumed knowledge requirements unless a formal waiver of such requirements is received from the Head of Department offering the subject concerned within the first 2 weeks of second semester.

10. It is the responsibility of students to apply to withdraw from any second semester subject for which they do not meet prerequisite or corequisite requirements unless a formal waiver of such requirements is received from the Head of Department offering the subject concerned within the first 2 weeks of second semester.

11. A student who renounces officially enrolled in a subject will receive a result in that subject. If a student ceases to attend classes but does not officially withdraw, the result will be Fail (FP).

12. Students wishing to add a second semester subject in place of a withdrawn subject should do so by 5 p.m. on Monday of the third week of second semester otherwise the Head of Department may refuse to permit the addition.

Late Addition or Substitution of Subjects

13. Applications to add subjects after the 5 p.m. on Monday of the third week of the semester in which the subject commenced will be approved by the Dean only when submitted with the written permission of the Head of the Department offering the subject. When considering a request for late addition of a subject, the Head of Department will take into account of:

- the ability of the student to catch up with work already completed in the subject;
- the effect that a late addition to the class may have on the work of students already enrolled in the subject; and
- where a student has been attending the subject without being enrolled, the reason why the student did not enrol in the subject within the first two weeks of the semester.

14. Note that dates are prescribed after which total semester workload may not be increased. This requirement prevents approval of the addition of a subject after those dates where total semester workload would be increased, even if the permission of the Head of Department is obtained. Students in doubt as to the requirements should consult the staff of the Faculty concerned from the Head of Department.

15. Addition or substitution of first semester subjects after 31 March and second semester subjects after 31 August will only be permitted by the Dean in exceptional circumstances and where the total semester workload of the student is not increased.

Non-Standard Programs

16. A non-standard program is one which includes subjects from more than one Year of the course program. While progression in each course offered in the Faculty of Engineering is by subject, the following rules apply to students wishing to enrol in a non-standard program.

- Students are expected to complete subjects in the order given in the course program. A student undertaking a non-standard program should therefore include all subjects yet to be completed from the lower year of the course. If a student withdraws from a subject, that subject is expected to be chosen from the higher year. The approval of the Course Coordinator is required for any departure from these expectations.

17. Applications for enrolment in the following non-standard programs will be approved without special permission being required:

- An annual program of subjects prescribed for a combined degree program in which a student is enrolled.
- Inclusion of Industrial Experience subjects by part-time students.
- An annual program which follows prescribed Year by Year transition arrangements.
- An annual program of subjects for which all of the following apply:
  - all prerequisite and corequisite requirements are met or written relaxation of the relevant requirements is submitted;
  - subjects extend over only two years of the course;
  - all subjects yet to be completed in the lower Year of the course program are included from any program proposed to replace;
  - where undertaken by a student with a WAM of 55 or more, has a total credit point value not exceeding 85 with no more than 50 credit points in a semester; and
  - where undertaken by a student with a WAM of 54 or less, has a total credit point value not exceeding 60 with no more than 40 credit points in a semester.

22. Enrolment in subjects extraneous to the requirements of the course in which the student is enrolled will normally only be approved when the student is otherwise enrolled in all subjects required to complete degree requirements and has a WAM of at least 55. The total annual program attempted by such a student, including extraneous subjects, shall not exceed 80 credit points. The approval of the Dean is required for any application to undertake extraneous subjects while a student is enrolled in any course offered in the Faculty of Engineering. The Dean may decline to approve any such application.

25. Note that the University charges a fee for enrolment in subjects which do not count towards degree requirements.

Appeals

26. A written appeal regarding any decision made under these rules may be made to the Dean who shall decide the matter.

Course Coordinators

Undergraduate Programs

| Chemical Engineering       | - Associate Professor R.H. Weiland |
| Civil Engineering          | - Dr W.G. Field                   |
| Combined Degree Programs   | - Dr W.G. Field                   |
| Computer Engineering       | - Associate Professor P.J. Muylan |
| Computer Science           | - Associate Professor G. Wrightson|
| Electrical Engineering     | - Dr I. Webster                   |
| Environmental Engineering  | - Dr B.J. Williams                |
| Industrial Engineering     | - Mr G.D. Bottler                 |
| Mechanical Engineering     | - Mr J.W. Hayes                   |
| Surveying                  | - Professor J.G. Fryer            |
| Postgraduate Coursework Programs | - Dr B. Berensford-Smith |
| GradDipCompSc              | - Dr M. Miller                    |
| GradDipSurv                | - Dr M. Miller                    |
| MComp                      | - Dr B. Berensford-Smith         |
| MEngSc                    | - Professor D.J. Hill             |

Undergraduate Performance and Progress

These policies apply to students enrolled in the Bachelor of Computer Science, Bachelor of Engineering and Bachelor of Surveying programs.

1. General

(1) The following policies are made under the powers vested in the Faculty Board, Faculty of Engineering, by the Rules of the University.

(2) In these Policies, unless the context or subject matter otherwise indicates or requires:

- "annual WAM" means the weighted average mark of the results of subjects taken in a particular calendar year.
- "degree" means the total requirements as prescribed in these Policies and the Regulations Governing Bachelor Degrees offered in the Faculty of Engineering which, when completed, qualify a candidate for the award of a degree in the relevant discipline.
- "Degree Regulations" means the Regulations Governing Bachelor Degrees in the Faculty of Engineering;
- "Department" means a department of the Faculty of Engineering;
- "Faculty Board" means the Faculty Board, Faculty of Engineering;
- "GradDipCompSc" means Head of the designated Department or the Head of Department's nominee;
- "Dean" means the Dean of the Faculty of Engineering;
- "GradDipSurv" means a department of the Faculty of Engineering;
- "Postgraduate Coursework Programs" means a department of the Faculty of Engineering;
- "Program" means a subject.
- "Programs" means a department of the Faculty of Engineering;
- "Programs" means the Faculty Board, Faculty of Engineering;
- "qualified" means Head of the designated Department or the Head of Department's nominee;
- "subject" means a department of the Faculty of Engineering
- "Year of Degree" means the total requirements as prescribed in the Regulations governing the degree program in which a student is enrolled.
- "WAM" means the weighted average mark of the results of subjects taken in a particular calendar year.
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labatory exercises, tutorials, class tests and formal examinations.

(2) Students will be informed of the method of assessment to
be adopted in each subject before the fourth week of
lectures in that subject. This information will include an
indication of the type of tasks comprising the assessment
and the proportion each task will contribute to the final
result in the subject concerned.

It should be noted that the final result in a subject is not
necessarily determined simply by the addition of marks
awarded for assessment tasks although the weighting of
each task and class attendance will be maintained except
where an application for special consideration is granted.

(3) In the case of subjects offered to students enrolled in any
undergraduate course in the Faculty by Departments of the
Faculty (and any department of another faculty willing to
take part in this procedure), the result in each subject will
be reported as follows:

<table>
<thead>
<tr>
<th>Result</th>
<th>Mark Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail</td>
<td>0 to 44%</td>
</tr>
<tr>
<td>Performance</td>
<td>45% to 100%</td>
</tr>
<tr>
<td>Fail (F)</td>
<td>45% to 54%</td>
</tr>
<tr>
<td>Pass (P)</td>
<td>55% to 64%</td>
</tr>
<tr>
<td>Credit (CR)</td>
<td>65% to 74%</td>
</tr>
<tr>
<td>Distinction (D)</td>
<td>75% to 84%</td>
</tr>
<tr>
<td>First Class Honours (1st)</td>
<td>85% to 90%</td>
</tr>
</tbody>
</table>

Students permitted to transfer from one course offered
in the Faculty to another shall, provided the credit point
value of the credit granted in the new course equals the
credit point value of all subjects previously completed in
the original course, retain the WAM achieved in the
original course as the basis for future WAM calculations.

(4) A mark of 50% is considered to be the normal pass/fail
level of performance, however it is recognized that no
matter how careful the assessment, an area of doubt may
exist within 5% of that mark. Therefore, while a mark below
50% is a clear fail and a mark of 55% is a clear pass,
percentage marks in the range of 45 to 54 are regarded as
indicating that a student, whilst performing closely at a
satisfactory level in the subject concerned, had nevertheless
demonstrated sufficient understanding of the subject to
proceed, provided other progress requirements are met,
without resorting to the material contained in the subject
as determined by Senate Rules Governing Unsatisfactory
Progress (Policy 5 below).

Students should note that while results of 45 to 49 are
(barely) acceptable in the context of the full requirements
of a particular course in the Faculty of Engineering, they
are unlikely to be considered adequate for full standing outside
the Faculty of Engineering. For example: a result of 48
awarded to a student enrolled in an engineering course in a
first year physics subject may be considered for standing in
the Faculty of Science and Mathematics at a Terminating
Pass level but would not be acceptable for full standing.

(5) In the case of subjects offered by departments of other
faculties, results may be awarded as grades (rather than
percentage marks) in accordance with University By-laws
and Regulations and the Policies of the Faculty Board.

4. Academic Performance

(1) The academic performance of each student enrolled in an
undergraduate course offered in the Faculty shall be meas-
ured by a cumulative Weighted Average Mark (WAM).

(2) The WAM is calculated from the results of all subjects
taken towards the satisfaction of Degree Requirements,
except as provided in Policy 4(5) below, in the following
manner:

\[
WAM = \frac{\sum (m \cdot v \cdot w)}{\sum v}
\]

Where:

- m = The Mark as defined in Policy 4(3) below.
- v = The credit point value of the subject concerned.
- w = The Weighting of the subject concerned as
determined under Policy 4(4) below.

(3) The Mark (‘m’) will be calculated as follows:

- Where the result in a subject is given in a range of 45 to
100 inclusive, ‘m’ is equal to that percentage mark.
- Where the result in a subject is a Failing grade, ‘m’ is
equal to 44.
- Where the result in a subject is a passing grade (rather
than a percentage mark), the Mark (‘m’) will be
determined by the relevant number listed below:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD</td>
<td>93</td>
</tr>
<tr>
<td>D</td>
<td>80</td>
</tr>
<tr>
<td>C</td>
<td>70</td>
</tr>
<tr>
<td>P</td>
<td>58</td>
</tr>
<tr>
<td>TP</td>
<td>58</td>
</tr>
<tr>
<td>TP</td>
<td>49</td>
</tr>
</tbody>
</table>

Where grades of ‘I’ are awarded the WAM will not be
calculated until a mark or a final grade shall be awarded
in that subject.

(4) Each subject shall have a weighting of 1, 2, 3 or 4 as set
out below.

<p>| Level at which the | Weighting |</p>
<table>
<thead>
<tr>
<th>subject is offered</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>200</td>
<td>2</td>
</tr>
<tr>
<td>300</td>
<td>3</td>
</tr>
<tr>
<td>400 and over</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: The level at which a subject is offered is indicated by the first
number in the subject code; for example, MECH101 is offered at
100 level and MECH312 is offered at 300 level.

(5) The following will be taken into account when calculating
the WAM:

- Subjects taken in satisfaction of course Elective
requirements will be considered to satisfy those
requirements in the order in which they are taken during
the course.
- Subjects taken extraneous to degree requirements will
not be included in the calculation of a student’s WAM.

- Students re-admitted to a course after an absence for
the previous academic year, will retain their previous
WAM as the basis for future calculations.

- Students permitted to transfer from one course offered
in the Faculty to another shall, provided the credit point
value of the credit granted in the new course equals the
credit point value of all subjects previously completed in
the original course, retain the WAM achieved in the
original course as the basis for future WAM calculations
in the new course.

- In all other cases, students admitted to a course shall
commence calculation of their WAM from the year of
their admission or re-admission, whether they be granted
credit or not.

(6) At the conclusion of second semester, each student’s WAM
shall be included in the schedule of recommended results
presented to Faculty Board, included on each student’s
notification of results and placed on the student’s academic
record; except that should a grade of ‘Incomplete’ (I) be
awarded to a student, the WAM will remain uncalculated
until final marks or grades are awarded.

(7) Students may appeal to any subject in which they were
awarded a result in the range of 45 to 54 or a grade of TP,
or to enrol in a subject which replaced a subject in that
category in the course program of the course in which they
are enrolled. In such a case:

- the subject originally taken remains part of the student’s
academic record and continues to be included in the
calculation of the student’s WAM as before.
- the repeated subject is included in the WAM calculations
of the year in which it is taken.
- if the student is awarded a failing grade in the repeated
subject, the failure is treated in the same way as if the
subject were attempted for the first time and the subject
must be repeated.

Note: Students will not normally be permitted to repeat subjects
in which they were awarded a final result of 55 or more, or a
passing grade.

5. Academic Progression

(1) A student who achieves a WAM of 55 or more is considered
to be clearly progressing at a satisfactory level in the course
as a whole.

(2) A student who has a WAM of 54 or less at the conclusion
of any year is considered to be on probation for the next year
of enrolment in the course and in jeopardy of possible
exclusion from the course. Exclusion for a period of at least
1 year, and/or permission to continue enrolment on specified
conditions, or
- Permission to continue
- Permission to continue

(5) A student subject to review who is permitted to continue
studies within the Faculty is considered to remain on
probation and continues to be subject to the provisions of
the Polices of Faculty Board as would a student placed on
probation under the provisions of Policy 5(2)

7. Satisfaction of Degree Requirements

(1) Students are considered to have passed the program of
subjects approved by Faculty Board in accordance with the
relevant schedule of the Regulations Governing Bachelor
Degrees Offered in the Faculty of Engineering when they have both:
- attained a result of 45 or more (or a passing grade) in each
of the subjects comprising the relevant program of subjects
approved by Faculty Board; and
- attained a WAM of 55 or more at the completion of that
program

(2) If a student completes the relevant program of subjects but
has not achieved a WAM of 55 or more, the student is not
regarded as having passed the program of subjects to the
satisfaction Faculty Board and is therefore ineligible for the
award of degree.

(3) A student who is ineligible for the award of a bachelor's
degree because of the terms of Policy 7(2) may repeat any
subject in which they were awarded a result in the range of
45 to 54 (in which case the conditions of Policy 4(7) apply)
or enrol in such other subjects not previously attempted as
the Dean, on the recommendation of the Head of the

6. Unsatisfactory Progress

(1) Students on probation who fail to attain a WAM of 55 or
more at the end of their probationary year and also fail to
achieve an Annual WAM of 55 or more in that year shall be
deemed not to have maintained a rate of progress consid-
ered satisfactory to the Faculty Board under Rule 4 of the
Rules Governing Unsatisfactory Progress. The progress of
such students will be reviewed by the Dean or Sub-Dean on
behalf of the Faculty Board.

(2) Students subject to review shall be advised of their rights
to make representations either in writing or in person prior to
decision under Rule 4 being taken.

(3) The Dean or Sub-Dean shall determine the time and place
at which students may make representations in person.

(4) The Dean or Sub-Dean shall, after considering any repre-
sentations made by any student subject to review and
the recommendation of the Head of the designated Depart-
mence, determine the action to be taken under Rule 4 of
the Rules Governing Unsatisfactory Progress which include:
- Exclusion for a period of at least 1 year;
- Permission to continue enrolment on specified condi-
tions; or
- Permission to continue

(5) A student subject to review who is permitted to continue
studies within the Faculty is considered to remain on
probation and continues to be subject to the provisions of
the Polices of Faculty Board as would a student placed on
probation under the provisions of Policy 5(2)

21
8. Awards of Honours - Engineering and Surveying

(1) Honours grades in the Bachelor of Engineering and Bachelor of Surveying programs will normally be awarded by Faculty Board on the basis of a graduating student's performance in the course as a whole as measured by the WAM according to the following schedule:

<table>
<thead>
<tr>
<th>Minimum WAM</th>
<th>Honours</th>
</tr>
</thead>
<tbody>
<tr>
<td>77</td>
<td>Class I</td>
</tr>
<tr>
<td>72</td>
<td>Class II Division 1</td>
</tr>
<tr>
<td>67</td>
<td>Class II Division 2</td>
</tr>
</tbody>
</table>

(2) If a student was granted credit at the time of his or her admission or re-admission to a course offered within the Faculty, the record of that student upon which the credit was based may be considered by Faculty Board in connection with the determination of the award of honour.

(3) A Head of Department may recommend to Faculty Board that a grade of honour be awarded other than that indicated by the WAM of the student concerned, or that no honours be awarded to a particular student. In this case, the Faculty Board may either make an award of honours in accordance with the recommendation of the Head of the Department concerned or in accordance with the schedule contained in Policy 8(1).

(4) Faculty Board will normally recommend BE and BSc:Surv graduates who achieve a WAM in the order of 85 or more for the award of a University Medal.

Other Faculty Policies

Honours in Computer Science

The level of honours to be awarded to candidates completing the requirements of the Bachelor of Computer Science (Honours) degree shall be determined by Faculty Board on the recommendation of the Head of the Department of Computer Science.

Progress Requirements for Combined Degree Candidates

Students admitted to the BE/BMath, BE/BSc, BMath/BCompSc and BSc/BCompSc combined degree programs after 1990 and the BE/BCompSc program after 1991, shall be required to maintain a WAM of at least 65 or otherwise show cause as to why the Faculty Board should not refer their case to the Admissions and Progress Committee under the Rules Governing Undergraduate Progress with a recommendation that they be excluded from continued enrolment in the combined degree program for a specified period.

Missing an Examination

Failure to attend a formal written examination is a very serious matter. Students are expected to attend examinations unless prevented from doing so by circumstances beyond their control - in which case, an application for Special Consideration should be lodged at the Faculty Office within the required time period (see below).

Special Consideration

It is recognised that during the course of their studies, students may suffer from illness or other serious circumstances beyond their control which affect their preparation for oral examination. University Rules provide for special consideration and they apply for Special Consideration (subject to the information in the General University Information section of this Handbook).

Applications for Special Consideration MUST be made on the prescribed form and should be lodged at the Faculty Office. Forms are available from the Faculty Office - Room EA206 (telephone 049 21 6665). As decisions can only be made on the basis of the information provided by the student, all available evidence should accompany each application. The evidence received must be complete and not less than 2 pages long. The medical certificate given on the prescribed form must be completed where an application is made on medical grounds. Further assessment will be made in accordance with the schedule contained in Policy 8(1).

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Failure by a Potential Graduate

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(3) A Head of Department may recommend to Faculty Board that a grade of honour be awarded other than that indicated by the WAM of the student concerned, or that no honours be awarded to a particular student. In such a case, Faculty Board may either make an award of honours in accordance with the recommendation of the Head of the Department concerned or in accordance with the schedule contained in Policy 8(1).

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It is recognised that during the course of their studies, students may suffer from illness or other serious circumstances beyond their control which affect their preparation for oral examination. University Rules provide for special consideration and they apply for Special Consideration (subject to the information in the General University Information section of this Handbook).

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(4) Faculty Board will normally recommend BE and BSc:Surv graduates who achieve a WAM in the order of 85 or more for the award of a University Medal.

Failure by a Potential Graduate

Where a student fails a single subject other than the final year project and is thereby prevented from qualifying to graduate, the Faculty Board may award a result of Incomplete (I) in that subject. Such a decision will not be taken until the results of all other subjects required to meet degree requirements are known. Thus a failure in a single first semester subject will be recorded as a PF unless the student has been enrolled in a program which was potentially sufficient to complete degree requirements in first semester. A result of PF given in a first semester subject may be reviewed at the conclusion of second semester in the light of marks achieved in the other subjects in that year and may be amended to '1' if it is then the only subject required to meet degree requirements. All such further assessments should be completed by the second week of January.

Review of Results

Students may apply through the University Examinations Office for a review of final results in subjects (see the General Information section of this Handbook for details of the procedure and the fee involved). All requests for review must be made by this procedure. A review of a result includes a check:

- that all required parts of the assessment have been included in the final result;
- that the content of examination scripts has been fairly considered, including, where possible, a review of marks awarded by the examiners; and
- that all marks contributing to the final result have been correctly weighted and their total accurately obtained.

Enquiries regarding Special Consideration may be directed to the Faculty Office.

Further Assessment

A department may grant further assessment where it considers appropriate to do so after considering a request for Special Consideration or to resolve a doubt as to the appropriate result in a subject. Further assessment will normally occur shortly after the final examination in the subject concerned:

- in the case of first semester subjects, before the end of the fifth week of the mid-year recess; and
- in the case of full-year and second semester subjects, before the end of the first week in December.

Submission of Final Year Project Reports

Meeting the deadline for submission of final year project reports is considered to be an important element of the subjects concerned. Departments within the Faculty have been requested by Faculty Board to adopt the following policies regarding the submission of final year project reports:

- The time for submission of final year project report will be set at 5.00 pm on a date (to be specified by the Department concerned) before or during the November examination period. This date is regarded in the same way as a final formal examination. That is, failure to submit the report as or before the date will be considered in the same way as failure to attend a formal written examination. The result will be failure, subject to any other decision which may be taken as a result of a request for Special Consideration.

- An extension of time for a submission, by way of an incomplete grade (I) being awarded in December, may only be granted in response to a formal request for Special Consideration made through the Faculty Office (see Special Consideration policy above). As students are expected to anticipate some delay or difficulties during the course of their project, Special Consideration will not normally be granted for circumstances involving less than 4 weeks loss of working time for the student.

- Submissions presented by the due date but not up to final presentation standard, or which require an acceptably small amount of additional work, may be granted a result of incomplete (I). Final submission of the report will then be required on a date (to be specified by the Department concerned) before the second week of January. The Project will then not be awarded a result higher than 64.

Year/Stage Classification

Full-time students are classified by year. Part-time students are classified by stage. Classification is determined by the number of credit points passed in accordance with the following table:

<table>
<thead>
<tr>
<th>Full-time</th>
<th>Part-time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit</td>
<td>Year</td>
</tr>
<tr>
<td>Points</td>
<td>Points</td>
</tr>
<tr>
<td>0-50</td>
<td>1-40</td>
</tr>
<tr>
<td>81-160</td>
<td>2-41-80</td>
</tr>
<tr>
<td>161-240</td>
<td>3-81-120</td>
</tr>
<tr>
<td>240-320</td>
<td>4-121-160</td>
</tr>
<tr>
<td>320-400</td>
<td>5-161-200</td>
</tr>
<tr>
<td>400-480</td>
<td>6-201-240</td>
</tr>
<tr>
<td>480-560</td>
<td>7-241-280</td>
</tr>
<tr>
<td>560-640</td>
<td>8-281-320</td>
</tr>
</tbody>
</table>

Students enrolled for the final year of any combined course will be classified as Year 5.

Industrial Experience - Engineering

General

Students enrolled in Bachelor of Engineering programs are
required to complete a total of at least 12 weeks of practical work of a nature acceptable to the Faculty Board. This practical experience may be either gained during long vacations or as part of an Industrial Experience elective. The University can accept no responsibility for finding employment for students wishing to enrol for Industrial Experience subjects or to find employment in order to satisfy industrial experience requirements. Students experiencing difficulty in obtaining suitable employment should contact the University’s Careers and Student Employment Office.

Full-Time Students

Full-time students will normally gain their practical experience during vacation employment. Students should obtain a statement from their employer certifying the nature and period of the employment undertaken and retain the statement so as to be in a position to provide it when called upon to do so.

Part-Time and Sandwich Pattern Students

Students enrolled in the degree of Bachelor of Engineering on a part-time basis may choose to take Industrial Experience elective subjects as provided in the relevant course program. To be eligible for enrolment in an Industrial Experience subject, the student must be in approved employment on the 1 November preceding the year in which the subject is to be taken. This approved employment must continue for one calendar year, that is, until the 31 October of the year in which the subject is taken. Students enrolled in Industrial Experience subjects must attend such lectures and seminars, and submit such reports, as the relevant Head of Department may require. Normally enrolment in an Industrial Experience subject will not be allowed in the first year of enrolment. Students attending on a "thick" sandwich pattern should consult with the Course Coordinator before enrolling in an Industrial Experience subject. The successful completion of one Industrial Experience subject satisfies the requirement that students complete 12 weeks practical experience.

Credit for Previous Studies

Students entering courses who believe that they may be eligible for credit on the basis of previous tertiary study should consult the Faculty Secretary. Evidence in the form of original academic transcripts and handbook descriptions of the content of the subjects studied should be provided.

Credit for TAFE Associate Diplomas

Faculty Board has approved the granting of credit to students enrolling in courses who hold certain TAFE Associate Diplomas (and TAFE Certificates obtained before the introduction of Associate Diploma programs). The credit to be granted will vary according to the TAFE qualification obtained, the course program in which the candidate is enrolled and the current requirements of that program. Further information may be obtained from the Faculty Secretary.

Leave of Absence

The formal requirements regarding leave of absence are included in the relevant schedules to the Award Rules. The provisions are summarised below. Enquiries regarding Leave of Absence in undergraduate courses and graduate coursework programs should be directed to the Faculty Office. Enquiries regarding leave of absence from research degrees should be directed to the Postgraduate Studies Office.

BACHELOR DEGREE COURSE PROGRAMS

About This Section

This section contains the detailed bachelor degree course programs approved by the Faculty Board which incorporate the list of Approved Subjects of the relevant Schedules of the Rules Governing Academic Awards.

A guide is also provided to the various patterns of attendance by which courses may be completed.

Students are expected to be aware of all aspects of the Course Program and approved requirements of the course in which they are enrolled. Attention is particularly drawn to the General Course Policies and other policies of the Faculty Board set out in the previous section of this Handbook.

Enquiries regarding course requirements may be directed to the Faculty Office or the Course Coordinator indicated in the course entry concerned.

Guide to Course Attendance Patterns

Course Programs are given in this Section for all bachelor degree courses. All students must complete the requirements of the relevant Course Program regardless of their attendance pattern.

The Faculty of Engineering offers a flexible array of attendance patterns which are designed to suit the individual needs of students. Each student may choose a pattern of attendance each year which suits them provided that academic progress is satisfactory and other course rules and requirements are met. The attendance patterns available are summarised below. Further enquiries may be directed to the Faculty Office.

Full-time Attendance

The great majority of students enrolled in the Faculty of Engineering attend as full-time students. Full-time attendance allows full concentration on course requirements during the academic year and is therefore the recommended pattern of attendance. Each engineering course may be completed in a minimum of 4 years of full-time study. The Computer Science program may be completed in 3 years full-time study.

Part-time Attendance

All or part of each Course Program may be completed by part-time attendance. Part-time students will normally take two years for each equivalent full-time year. Although a 6 year pattern of attendance, of which the last year is full-time, is possible in the Chemical Engineering program.

The first two part-time stages of all courses are timetabled to permit a single day work release attendance pattern with some evening lectures. In the latter years of each course, attendance will be required at various times during the day depending upon the subjects in which the student is enrolled and the requirements of the timetable. Full-time study is recommended after Stage 2.

While each student enrolled in less than 60 credit points is regarded as a part-time student, there is no minimum number of subjects in which part-time students must enrol in each year. Part-time students may also choose to enrol in Industrial Experience subjects and count these units as Effective units as permitted by the Elective Requirements of the relevant course.

Sandwich Programs

Each course may be undertaken on a "thick" sandwich attendance pattern in which full-time attendance at University is alternated with full-time employment on an annual basis. This allows work experience to be undertaken in 15 month periods between Years 1 and II, Years II and III and Years III and IV. Such a pattern would require a minimum of 7 years to complete degree requirements. The number of years of work experience undertaken may vary according to the needs of the student. As this attendance
pattern does not require attendance at University when gaining work experience, employment may be undertaken in areas remote from the University thereby adding to the diversity of the experience which may be gained and increasing the opportunities to obtain work experience employment.

Students following this pattern should contact the Faculty Office in August of each year of full-time employment for information on the appropriate procedure to apply for re-enrolment in their course in the following year.

The Traineeship Pattern

Some traineeships may continue to be offered on the basis of a part-time attendance pattern, however the following program is recommended as the most suitable method of combining academic course requirements with work experience.

Year 1 Stage 1 Part-time attendance at University plus vacation work
Year 2 Stage 2 Part-time attendance at University plus vacation work
Year 3 Year II Full-time attendance at University plus vacation work
Year 4 Year III Full-time attendance at University
Year 5 - Full-time work experience - 15 months (approx.)
Year 6 Year IV Full-time attendance at University - completion of studies.

A further 15 month period of work experience could be included between Years II and III resulting in a 7 year minimum program.

This attendance pattern allows both the employer and employee a period of assessment in Stages 1 and 2. After completing first year studies, trainees are in a position to give their full attention to their academic studies in Years II, III and IV of their course and to gain valuable practical experience during the 15 month period of work experience. The length of the major work experience period(s) makes it possible for the trainee to experience a full annual cycle of the operation of his or her employer's organisation and to give full attention to participating in the work of that organisation. The length of the major period(s) of work experience also enables trainees to gain practical experience in locations outside Newcastle.

Fielding Employment

While the Careers and Student Employment Office of the University will assist students to find employment to complement their chosen attendance pattern, the University cannot accept any responsibility for finding appropriate positions for students.

### Chemical Engineering

**Degree:** Bachelor of Engineering (BE) awarded in the specialisation of Chemical Engineering

**Designated Department:** Department of Chemical Engineering

**Course Coordinator:** Associate Professor R.H. Weiland

#### Course Program

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>YEAR I</strong> Semester 1</td>
<td></td>
</tr>
<tr>
<td>CHEE111 Industrial Process Principles</td>
<td>5</td>
</tr>
<tr>
<td>CHEM101 Chemistry 101</td>
<td>10</td>
</tr>
<tr>
<td>MATH111 Mathematics 111 *</td>
<td>10</td>
</tr>
<tr>
<td>MCH102 Programming</td>
<td>5</td>
</tr>
<tr>
<td>PHYS101 Physics 101 *</td>
<td>10</td>
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<td><strong>Semester 2</strong></td>
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<tr>
<td>CHEE112 Introduction to Chemical Engineering</td>
<td>10</td>
</tr>
<tr>
<td>CHEE113 Chemical and Manufacturing Processes</td>
<td>10</td>
</tr>
<tr>
<td>MCH102 Programming</td>
<td>5</td>
</tr>
<tr>
<td>MATH112 Mathematics 112 *</td>
<td>10</td>
</tr>
<tr>
<td>* Approved Options</td>
<td></td>
</tr>
<tr>
<td>1. MATH102 and MATH103 may replace MATH111 and MATH112</td>
<td></td>
</tr>
<tr>
<td>2. PHYS102 may replace PHYS101</td>
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<tr>
<td><strong>YEAR II</strong> Semester 1</td>
<td></td>
</tr>
<tr>
<td>CHEE137 Design Principles</td>
<td>10</td>
</tr>
<tr>
<td>CHEE142 Chemical Engineering Computations</td>
<td>10</td>
</tr>
<tr>
<td>CHEE263 Transfer Principles 1</td>
<td>10</td>
</tr>
<tr>
<td>CHEE281 Laboratory 1</td>
<td>5</td>
</tr>
<tr>
<td>MATH201 Multivariable Calculus</td>
<td>5</td>
</tr>
<tr>
<td><strong>Semester 2</strong></td>
<td></td>
</tr>
<tr>
<td>CHEE264 Transfer Principles 2</td>
<td>10</td>
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<tr>
<td>CHEE282 Laboratory 2</td>
<td>10</td>
</tr>
<tr>
<td>CHEM241 Physical Chemistry</td>
<td>10</td>
</tr>
<tr>
<td>MATH202 Partial Differential Equations 1</td>
<td>5</td>
</tr>
<tr>
<td>MATH203 Ordinary Differential Equations 1</td>
<td>5</td>
</tr>
<tr>
<td><strong>YEAR III</strong> Semester 1</td>
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<tr>
<td>CHEE321 Modelling of Processes</td>
<td>5</td>
</tr>
<tr>
<td>CHEE322 Thermodynamics</td>
<td>10</td>
</tr>
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<td>CHEE341 Project Engineering</td>
<td>10</td>
</tr>
<tr>
<td>CHEE382 Laboratory 3</td>
<td>5</td>
</tr>
<tr>
<td>Technical Electives</td>
<td>10</td>
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<tr>
<td><strong>Semester 2</strong></td>
<td></td>
</tr>
<tr>
<td>CHEE342 Safety and Environment</td>
<td>10</td>
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<tr>
<td>CHEE381 Engineering Applications Laboratory</td>
<td>5</td>
</tr>
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<td>CHEE383 Laboratory 4</td>
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<tr>
<td>Technical Electives</td>
<td>10</td>
</tr>
<tr>
<td>* Approved Options</td>
<td></td>
</tr>
<tr>
<td>1. MATH102 and MATH103 may replace MATH111 and MATH112</td>
<td></td>
</tr>
<tr>
<td>2. PHYS102 may replace PHYS101</td>
<td></td>
</tr>
</tbody>
</table>

#### General Course Policies

The general rules of the University apply to this course. In particular, students may require permission from the Faculty of Engineering and Physical Sciences to enrol in some course subjects for which they have not met the stated prerequisites. The attention of students is drawn to the General Course Policies in the Faculty Policy Section of this Handbook.

#### Technical Electives

The Technical Electives must be selected from the list below. Not all Technical Elective subjects will be offered in any one year. The subjects to be offered will be displayed on the Department Notice Board in Semesters 2 and 3 of the previous year.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEE351 Electrochemistry and Corrosion</td>
<td>5</td>
</tr>
<tr>
<td>CHEE352 Transport Phenomena</td>
<td>5</td>
</tr>
<tr>
<td>CHEE353 Surface Chemistry 1</td>
<td>10</td>
</tr>
<tr>
<td>CHEE354 Biotechnology</td>
<td>5</td>
</tr>
<tr>
<td>CHEE356 Process Synthesis</td>
<td>5</td>
</tr>
<tr>
<td>CHEE357 Fuel Technology 1</td>
<td>5</td>
</tr>
<tr>
<td>CHEE358 Process Metallurgy 1</td>
<td>5</td>
</tr>
<tr>
<td>CHEE366 Waste Management</td>
<td>5</td>
</tr>
<tr>
<td>CHEE367 Analysis of Pollution</td>
<td>5</td>
</tr>
<tr>
<td>SCEN202 Environmental Planning and Pollution Control</td>
<td>10</td>
</tr>
</tbody>
</table>

#### General Electives

General Electives may be chosen from any course offered within the University at 100, 200, 300, or 400 level provided that prerequisites are met (or written permission obtained from the Head of the Department offering the subject). Recommended electives are listed below. Not all elective subjects may be offered in any one year. Students will be advised in Semesters 2 and 3 of the preceding year of the particular CHEE400 level elective subjects which are intended to be offered.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEE191 Industrial Experience *</td>
<td>5</td>
</tr>
<tr>
<td>CHEE192 Industrial Experience *</td>
<td>5</td>
</tr>
<tr>
<td>CHEE193 Industrial Experience *</td>
<td>5</td>
</tr>
<tr>
<td>CHEE194 Industrial Experience *</td>
<td>5</td>
</tr>
<tr>
<td>CHEE451 Surface Chemistry 2</td>
<td>5</td>
</tr>
<tr>
<td>CHEE452 Mineral Processing 2</td>
<td>5</td>
</tr>
<tr>
<td>CHEE453 Process Optimization</td>
<td>5</td>
</tr>
<tr>
<td>CHEE454 Fuel Technology 2</td>
<td>5</td>
</tr>
<tr>
<td>CHEE455 Heat Transfer</td>
<td>5</td>
</tr>
<tr>
<td>CHEE456 Process Metallurgy 2</td>
<td>5</td>
</tr>
</tbody>
</table>
Combined Degree Programs

Combined degree programs are available which allow completion of the requirements for the Bachelor of Engineering (BE) degree in the specialisation of Chemical Engineering together with the requirements for a degree of Bachelor of Mathematics (BMath) and Bachelor of Science (BSc) (Chemistry Major). The subjects undertaken in the first year of study of each program are identical to those required in the Chemical Engineering program except that the inclusion of MATH102 and MATH103 is required. Combined degree programs each require a minimum of 5 years full-time study.

Note that students undertaking a combined degree program are attempting two distinct programs concurrently and therefore the annual enrolment required by such a program may exceed the normal annual load of 80 credit points. Also note that HECS will be calculated on the basis of the proportion which each individual subject counts in the program of the separate degree of which it forms part and not on the proportion it contributes to any combined degree program. Timetabling constraints may limit the choice of optional subjects.

Direct entry to combined programs may be gained via UAC by applicants who achieve highly on the NSW HSC (or equivalent). Students may also enter combined degree programs at the conclusion of Year 11 if they have achieved a WAM of 70. Application should be made in conjunction with submission of the re-enrolment application. The Faculty Office may be consulted regarding application forms and course requirements.

Civil Engineering

Degree: Bachelor of Engineering (BE) awarded in the specialisation of Civil Engineering

Designated Department: Department of Civil Engineering and Surveying

Course Coordinator: Dr W. G. Field

Course Program

Subjects Credit Points

YEAR I
Semester 1
CIVL112 Mechanics of Solids 5
CIVL122 Materials 2 5
CIVL124 Geotechnical Investigation 10
CIVL123 Fluid Mechanics 2 5
CIVL124 Environmental Engineering 2 5
MA0209 Legal Process 10
MATH121 Multivariable Calculus 5

Semester 2
CIVL213 Theory of Structures 1 5
CIVL223 Materials 3 5
CIVL233 Fluid Mechanics 3 5
CIVL251 Systems 5
MATH203 Ordinary Differential Equations 1 5
MECH205 Engineering Computations 5

Both Semesters
CIVL271 Transportation Engineering 10

YEAR II
Semester 1
CIVL314 Theory of Structures 2 5
CIVL315 Stress Analysis 5
CIVL317 Steel Design 10

Semester 2
CIVL325 Soil Mechanics 1 5
CIVL334 Open Channel Hydraulics 5
CIVL331 Statistical Methods 5

Semester 1
CIVL316 Reinforced Concrete Design 10
CIVL326 Soil Mechanics 2 5
CIVL327 Concrete and Metals Technology 5
CIVL334 Hydrology 5
CIVL322 Management 5
CIVL332 Finite Elements Method 5

Both Semesters
PHIL391 Technology and Human Values 1 10

YEAR III
Semester 1
CIVL411 Environmental Engineering 1 5
CIVL412 Materials 4 5
CIVL421 Environmental Management 5
SURV401 Surveying 2 10

Semester 2
CIVL413 Environmental Engineering 2 5
CIVL422 Environmental Management 5
SURV412 Surveying 2 10

Semester 3
CIVL501 Project 15

Elective Requirements

Electives may be chosen from any subjects offered within the University at 100, 200, 300, or 400 level provided that prerequisites are met (or written permission obtained from the Head of the Department offering the subject). Recommended electives are listed below. Not all electives may be offered in any one year. Students will be advised in September of the preceding year which CIVL400 level elective subjects will be available.

Recommended Elective Subjects Credit Points

BEHE242 Safety and Environment 10
CIVL191 Industrial Experience 5
CIVL192 Industrial Experience 5
CIVL193 Industrial Experience 5
CIVL194 Industrial Experience 5
CIVL410 Dynamics and Stability of Structures 5
CIVL429 Rock Mechanics 5
CIVL435 River and Coastal Engineering 5
CIVL457 Engineering Risk Assessment 5
CIVL472 Highway Engineering 5
CIVL491 Special Topic 5
CIVL492 Special Topic 5
ECOP371 Principles of Economics 10
MA94201 Partial Differential Equations 1 5
SURV213 Surveying 3 10

* Approved Options
1. MATH102 and MATH103 may replace MATH111 and MATH112.
2. PHYS101 may replace PHYS102.

Prerequisite and Corequisite Requirements

The prerequisite and corequisite requirements of individual subjects are listed in the schedule presented in Section 9 of this Handbook. Enrolment in a subject contrary to the provisions of this schedule will not be approved without the written permission of the Head of the Department offering the subject concerned.

Part-time Attendance

All candidates for the degree must complete the requirements of the Course Program given above. All or part of this program may be completed by part-time attendance. Part-time students will normally take two years for each equivalent full-time year. The first two stages of the course are timetabled to permit a single-day work release attendance pattern with some evening lectures.

These stages are:

STAGE 1

CIVL112 Mechanics of Solids 5
CIVL122 Materials 2 5
CIVL124 Geotechnical Investigation 10
CIVL123 Fluid Mechanics 2 5
CIVL124 Environmental Engineering 2 5
MA0209 Legal Process 10
MATH121 Multivariable Calculus 5

STAGE 2

CIVL314 Theory of Structures 2 5
CIVL315 Stress Analysis 5
CIVL317 Steel Design 10
CIVL325 Soil Mechanics 1 5
CIVL334 Open Channel Hydraulics 5
CIVL331 Statistical Methods 5

STAGE 3

CIVL411 Environmental Engineering 1 5
CIVL412 Materials 4 5
CIVL421 Environmental Management 5
SURV401 Surveying 2 10

STAGE 4

CIVL501 Project 15

Elective Subjects

Electives may be chosen from any subjects offered within the University at 100, 200, 300, or 400 level provided that prerequisites are met (or written permission obtained from the Head of the Department offering the subject). Recommended electives are listed below. Not all electives may be offered in any one year. Students will be advised in September of the preceding year which CIVL400 level elective subjects will be available.

Recommended Elective Subjects Credit Points

BEHE242 Safety and Environment 10
CIVL191 Industrial Experience 5
CIVL192 Industrial Experience 5
CIVL193 Industrial Experience 5
CIVL194 Industrial Experience 5
CIVL410 Dynamics and Stability of Structures 5
CIVL429 Rock Mechanics 5
CIVL435 River and Coastal Engineering 5
CIVL457 Engineering Risk Assessment 5
CIVL472 Highway Engineering 5
CIVL491 Special Topic 5
CIVL492 Special Topic 5
ECOP371 Principles of Economics 10
MA94201 Partial Differential Equations 1 5
SURV213 Surveying 3 10

* Approved Options
1. MATH102 and MATH103 may replace MATH111 and MATH112.
2. PHYS101 may replace PHYS102.

After completion of the above program all students will be required to complete the following requirements:

1. MATH102 and MATH103 may replace MATH111 and MATH112.
2. PHYS101 may replace PHYS102.
3. A thesis will be required.

The table above should be read following the introduction of this Handbook. It is strongly recommended that students consider part-time study and are advised to consult the Guide to Attendance Patterns at the beginning of this Section of the Handbook.

Transition Arrangements

The Course Program has been amended with effect from the commencement of the 1993 academic year. All students enrolled in this course or any combined degree program of which it forms
SECTION FIVE

BACHELOR DEGREE COURSE PROGRAMS

Computer Engineering

Degree: Bachelor of Engineering (BE) awarded in the specialisation of Computer Engineering

Designated Department: Department of Electrical and Computer Engineering

Course Coordinator: Associate Professor P.J. Moylan

Course Program

<table>
<thead>
<tr>
<th>Semester</th>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>YEAR I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester 1</td>
<td>ELEC101 Introduction to Electrical and Computer Engineering</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MATH102 Mathematics 102 **</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>PHYS102 Physics 102</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>MEC1121 Materials 1</td>
<td>5</td>
</tr>
<tr>
<td>Semester 2</td>
<td>MATH103 Mathematics 103 **</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>PHYS103 Physics 103</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>CIVL111 Mechanics and Structures</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MEC111 Engineering Drawing</td>
<td>5</td>
</tr>
<tr>
<td><strong>Both Semesters</strong></td>
<td>ELEC10 Electromechanical Engineering 1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>ELEC170 Computer Engineering 1</td>
<td>10</td>
</tr>
<tr>
<td><strong>Approved Option</strong></td>
<td>See note on Year 1 Mathematics Option below</td>
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<tr>
<td><strong>YEAR II</strong></td>
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<td></td>
</tr>
<tr>
<td>Semester 1</td>
<td>MATH201 Multivariable Calculus</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MATH206 Complex Analysis</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MATH218 Linear Algebra 2 **</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>PHYS201 Quantum Mechanics and Electromagnetism</td>
<td>10</td>
</tr>
<tr>
<td>Semester 2</td>
<td>MATH203 Ordinary Differential Equations 1</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>ELEC220 Electronics 1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>ELEC231 Electrical Circuits</td>
<td>10</td>
</tr>
<tr>
<td><strong>Both Semesters</strong></td>
<td>COMP101 Computer Science 1</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>ELEC210 Introduction to Energy Systems</td>
<td>10</td>
</tr>
<tr>
<td><strong>Approved Option</strong></td>
<td>MATH121 may be taken in lieu of MATH218</td>
<td></td>
</tr>
</tbody>
</table>

**Semester 2**

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP204 Programming Language Semantics</td>
<td>5</td>
</tr>
<tr>
<td>COMP206 Theory of Computation</td>
<td>5</td>
</tr>
<tr>
<td>ELEC322 Power Electronics</td>
<td>5</td>
</tr>
<tr>
<td><strong>Both Semesters</strong></td>
<td></td>
</tr>
<tr>
<td>ELEC211 Linear Electronics</td>
<td>10</td>
</tr>
<tr>
<td>ELEC350 Communications and Signal Processing</td>
<td>10</td>
</tr>
<tr>
<td>ELEC371 Microprocessor Systems</td>
<td>10</td>
</tr>
<tr>
<td>ELEC372 Computer Architecture</td>
<td>10</td>
</tr>
<tr>
<td>MEC1141 Automatic Control</td>
<td>10</td>
</tr>
</tbody>
</table>

**YEAR IV**

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Semester 2</strong></td>
<td>ELEC485 Computer Engineering Project</td>
<td>30</td>
</tr>
</tbody>
</table>

**Approved Option**

ELECTIVE SUBJECTS

- **Year 1 Mathematics Option**

- **Semester 1**
  - MATH102 Mathematics 102 **
  - PHYS102 Physics 102
- **Semester 2**
  - MATH103 Mathematics 103 **
  - PHYS103 Physics 103

**Semester 1**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC421 VLSI Design</td>
<td>10</td>
</tr>
<tr>
<td>ELEC422 Electronics Design</td>
<td>10</td>
</tr>
<tr>
<td>ELEC440 Advanced Control</td>
<td>10</td>
</tr>
<tr>
<td>ELEC441 Control System Design and Management</td>
<td>10</td>
</tr>
<tr>
<td>ELEC453 Digital Communications</td>
<td>5</td>
</tr>
<tr>
<td>ELEC454 Engineering Electromagnetics</td>
<td>5</td>
</tr>
<tr>
<td>ELEC470 Advanced Computer Architecture</td>
<td>10</td>
</tr>
<tr>
<td>ELEC460 Computer Software</td>
<td>10</td>
</tr>
</tbody>
</table>

**Semester 2**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH102 Mathematics 102 **</td>
<td>10</td>
</tr>
<tr>
<td><strong>Semester 3</strong></td>
<td>ELEC485 Computer Engineering Project</td>
</tr>
</tbody>
</table>

**Approved Option**

- MATH121 Linear Electronics
- ELEC350 Communications and Signal Processing
- ELEC372 Computer Architecture
- MEC1141 Automatic Control
- **YEAR IV**

**Approved Option**

ELECTIVE SUBJECTS

- **Semester 1**
  - MATH102 Mathematics 102 **
  - PHYS102 Physics 102
- **Semester 2**
  - MATH103 Mathematics 103 **
  - PHYS103 Physics 103

**Semester 1**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC421 VLSI Design</td>
<td>10</td>
</tr>
<tr>
<td>ELEC422 Electronics Design</td>
<td>10</td>
</tr>
<tr>
<td>ELEC440 Advanced Control</td>
<td>10</td>
</tr>
<tr>
<td>ELEC441 Control System Design and Management</td>
<td>10</td>
</tr>
<tr>
<td>ELEC453 Digital Communications</td>
<td>5</td>
</tr>
<tr>
<td>ELEC454 Engineering Electromagnetics</td>
<td>5</td>
</tr>
<tr>
<td>ELEC470 Advanced Computer Architecture</td>
<td>10</td>
</tr>
<tr>
<td>ELEC460 Computer Software</td>
<td>10</td>
</tr>
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</table>

**Semester 2**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH102 Mathematics 102 **</td>
<td>10</td>
</tr>
<tr>
<td><strong>Semester 3</strong></td>
<td>ELEC485 Computer Engineering Project</td>
</tr>
</tbody>
</table>

**Approved Option**

ELECTIVE SUBJECTS

- **Semester 1**
  - MATH102 Mathematics 102 **
  - PHYS102 Physics 102
- **Semester 2**
  - MATH103 Mathematics 103 **
  - PHYS103 Physics 103

**Semester 1**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC421 VLSI Design</td>
<td>10</td>
</tr>
<tr>
<td>ELEC422 Electronics Design</td>
<td>10</td>
</tr>
<tr>
<td>ELEC440 Advanced Control</td>
<td>10</td>
</tr>
<tr>
<td>ELEC441 Control System Design and Management</td>
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<tr>
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<tr>
<td>ELEC454 Engineering Electromagnetics</td>
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<tr>
<td>ELEC470 Advanced Computer Architecture</td>
<td>10</td>
</tr>
<tr>
<td>ELEC460 Computer Software</td>
<td>10</td>
</tr>
</tbody>
</table>

**Semester 2**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH102 Mathematics 102 **</td>
<td>10</td>
</tr>
</tbody>
</table>

**Combined Degree Programs**

**BE(Civil Engineering)/BSurv**

A program which allows completion of the requirements of the BE(Civil Engineering) and BSurv is also available. The subjects undertaken in the first year of study of each program are identical to those required in the Civil Engineering program. The BE/BSurv degree program requires a minimum of 5 years full-time study. Admission to the program will be granted after satisfactory completion of Year 1 of either program (that is a WAM of 55 or more).

Note that students undertaking a combined degree program are attempting two distinct programs concurrently and therefore the annual enrolment required by such a program may exceed the normal annual load of 80 credit points. Also note that HESCs will be calculated on the basis of the proportion which each individual subject counts in the program of the separate degree of which it forms part and not on the proportion it contributes to any combined degree program. Timetabling constraints may limit the choice of optional subjects.

The detailed BE(Civil Engineering)/BSurv combined degree program is summarised in the Surveying section of this Handbook.

Application

Application should be made in conjunction with submission of the re-enrolment application. The Faculty Office may be consulted regarding application forms and course requirements.

Other Combined Degree Programs

Combined degree programs may also be available which allow completion of the requirements for the Bachelor of Engineering (BE) degree in the specialisation of Civil Engineering together with the requirements for another degree, for example Bachelor of Mathematics (BMath) and Bachelor of Science (BScs). The development of an individual program which meet with the approval of the Deans of the faculties concerned will be required. Students normally apply to enter combined degree programs at the conclusion of Year 1. These combined degree programs require a WAM of 70 for entry.
### BACHELOR DEGREE COURSE PROGRAMS

#### Computer Science

**Degree:** Bachelor of Computer Science (BCompSc)

**Designated Department:** Department of Computer Science

**Course Coordinator:** Associate Professor G. Wrightson

#### Course Program

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>YEAR I</strong></td>
<td></td>
</tr>
<tr>
<td>Semester 1</td>
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</tr>
<tr>
<td>MATH111 Mathematics 111 *</td>
<td>10</td>
</tr>
<tr>
<td>Semester 2</td>
<td></td>
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<tr>
<td>MATH112 Mathematics 112 *</td>
<td>10</td>
</tr>
<tr>
<td><strong>Both Semesters</strong></td>
<td></td>
</tr>
<tr>
<td>COMP101 Computer Science 1</td>
<td>20</td>
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<tr>
<td>ELEC170 Computer Engineering 1</td>
<td>10</td>
</tr>
<tr>
<td>Year 1 Electives</td>
<td>80</td>
</tr>
</tbody>
</table>

* Approved Option

**YEAR II**

| Semester 1 |               |
| COMP201 Advanced Data Structures | 5 |
| COMP203 Assembly Language | 5 |
| COMP205 System Programming | 5 |
| MATH212 Discrete Mathematics | 5 |
| MATH217 Linear Algebra 1 ** | 5 |
| **Semester 1 or Semester 2** | 20 |
| Electives |               |
| 200 level Electives | 10 |
| 200 level MATH or STAT Elective | 5 |
| **Semester 2** |          |
| COMP202 Computer Architecture | 5 |
| COMP204 Programming Language Semantics | 5 |
| COMP206 Theory of Computation | 5 |
| PHIL242 Basic Symbolic Logic | 5 |
| **Approved Option** |          |
| Students who complete MATH102 and MATH103 in Year I may replace MATH217 with MATH218 Linear Algebra 2. |  |

#### YEAR III

| Semester 1 |               |
| COMP301 Compiler Design | 10 |
| COMP303 Computer Networks | 10 |
| COMP305 Design and Analysis of Algorithms | 10 |
| **Semester 2** |          |
| COMP302 Artificial Intelligence | 10 |
| COMP304 Database Design | 10 |
| COMP306 Computer Graphics | 10 |
| COMP308 Operating Systems | 10 |

### Transition Arrangements

The Course Program has been amended with effect from the commencement of the 1993 academic year. All students enrolled in this course or any combined degree program which it forms part, are required to meet the requirements of the new Course Program. The following equivalence between previous subjects and new subjects will apply.

<table>
<thead>
<tr>
<th>Previous Subject</th>
<th>New Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP205</td>
<td>COMP203</td>
</tr>
<tr>
<td>ELEC101</td>
<td>ELEC101</td>
</tr>
<tr>
<td>ELEC230</td>
<td>ELEC210 and ELEC231</td>
</tr>
<tr>
<td>ELEC230</td>
<td>ELEC231 and ELEC232</td>
</tr>
<tr>
<td>ELEC350</td>
<td>INF0203</td>
</tr>
<tr>
<td>ELEC420</td>
<td>ELEC421 and ELEC422</td>
</tr>
<tr>
<td>ELEC450</td>
<td>ELEC453 and ELEC454</td>
</tr>
<tr>
<td>ELEC470</td>
<td>ELEC471</td>
</tr>
<tr>
<td>ELEC485</td>
<td>ELEC485</td>
</tr>
</tbody>
</table>

* Students who completed ELEC350 Communications prior to 1992 who intend to undertake ELEC430 Advanced Communications may undertake ELEC380 and ELEC453.

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

#### Combined Degree Programs

Combined degree programs are available which allow completion of the requirements for the Bachelor of Engineering (BE) degree in the specialisation of Computer Engineering together with the requirements for a degree of Bachelor of Computer Science (BCompSc), Bachelor of Mathematics (BMATH) and Bachelor of Science (BSci) (Physics Major). The subjects undertaken in the first year of study of each program are identical to those required in the Computer Engineering program except that the inclusion of MATH102 and MATH103 is required. Combined degree programs each require a minimum of 5 years full-time study.

Note that students undertaking a combined degree program are attempting two distinct programs concurrently and therefore the annual enrolment required by such a program may exceed the normal annual load of 80 credit points. Also note that HICS will be calculated on the basis of the proportion which each individual subject counts in the program of the separate degree of which it forms part and not on the proportion it contributes to any combined degree program. Timetabling constraints may limit the choice of optional subjects.

Direct entry to combined programs may be gained via UAC by applicants who achieve highly attain at the NSW HSC (or equivalent). Students may also enter combined degree programs at the conclusion of Year II if they have achieved a WAM of 70. Application should be made in conjunction with submission of the enrolment application. The Faculty Office may be consulted regarding application forms and course requirements.
Computer Science Honours

Degree: Bachelor of Computer Science (Honours) (BCompSc(Hons))

Designated Department: Department of Computer Science

Course Coordinator: Dr. B. Beresford-Smith

The BCompSc(Hons) program is a postgraduate degree taken over one full-time year or two part-time years. The program is normally undertaken by students with a superior record in the BCompSc program who wish to deepen their knowledge in the discipline of Computer Science as further preparation for professional practice or to meet the requirements for admission to a research degree program. Entry to the honours program is possible for graduates of other disciplines. Enquiries regarding admission should be directed to the Course Coordinator.

The BCompSc(Hons) course program approved by the Faculty Board is presented below.

Course Program

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP425 Honours Project</td>
<td>20</td>
</tr>
<tr>
<td>Selected COMP400 Level Subjects</td>
<td>60</td>
</tr>
<tr>
<td>*</td>
<td>80</td>
</tr>
</tbody>
</table>

* In exceptional circumstances the Head of the Department of Computer Science may approve enrolment in other subjects.

COMP400 Level Subjects

All COMP400 Level subjects are listed below. Not all subjects will be offered in any one year. Students will be advised of subjects intended to be offered in September of the preceding year. Subjects indicated as available may be withdrawn if enrolment is insufficient.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP401 Advanced Artificial Intelligence</td>
<td>10</td>
</tr>
<tr>
<td>COMP402 Formal Semantics of Programming Languages</td>
<td>10</td>
</tr>
<tr>
<td>COMP403 Advanced Computer Architecture</td>
<td>10</td>
</tr>
<tr>
<td>COMP404 Parallel Computation and VLSI</td>
<td>10</td>
</tr>
<tr>
<td>COMP405 Digital Image Processing</td>
<td>10</td>
</tr>
<tr>
<td>COMP406 Advanced Operating Systems</td>
<td>10</td>
</tr>
<tr>
<td>COMP408 Natural Language Processing</td>
<td>10</td>
</tr>
<tr>
<td>COMP409 Computer Networks</td>
<td>10</td>
</tr>
<tr>
<td>COMP410 Advanced Computer Networks</td>
<td>10</td>
</tr>
<tr>
<td>COMP411 Special Topic A</td>
<td>10</td>
</tr>
<tr>
<td>COMP412 Special Topic B</td>
<td>10</td>
</tr>
<tr>
<td>COMP413 Special Topic C</td>
<td>10</td>
</tr>
<tr>
<td>COMP414 Special Topic D</td>
<td>10</td>
</tr>
<tr>
<td>COMP415 Graph Algorithms</td>
<td>10</td>
</tr>
<tr>
<td>COMP416 Distributed Operating Systems</td>
<td>10</td>
</tr>
<tr>
<td>COMP417 Database Security</td>
<td>10</td>
</tr>
<tr>
<td>COMP418 Geometric Algorithms</td>
<td>10</td>
</tr>
<tr>
<td>COMP435 Special Topic E</td>
<td>20</td>
</tr>
</tbody>
</table>

Electrical Engineering

Degree: Bachelor of Engineering (BE) awarded in the specialisation of Electrical Engineering

Designated Department: Department of Electrical and Computer Engineering

Course Coordinator: Dr. I. Webster

Course Program

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC101 Introduction to Electrical and Computer Engineering</td>
<td>5</td>
</tr>
<tr>
<td>ELEC102 Mathematics 102</td>
<td>10</td>
</tr>
<tr>
<td>MECH111 Engineering Drawing</td>
<td>5</td>
</tr>
<tr>
<td>PHYS102 Physics 102</td>
<td>10</td>
</tr>
<tr>
<td>MECH103 Mathematics 103</td>
<td>10</td>
</tr>
<tr>
<td>MECH121 Materials 1</td>
<td>5</td>
</tr>
<tr>
<td>PHYS103 Physics 103</td>
<td>10</td>
</tr>
<tr>
<td>ELEC230 Electrical Engineering</td>
<td>10</td>
</tr>
<tr>
<td>ELEC170 Computer Engineering</td>
<td>10</td>
</tr>
<tr>
<td>*</td>
<td>80</td>
</tr>
</tbody>
</table>

* Approved Option

Note: See note on Year 1 Mathematics Option below.

YEAR II

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester 1</td>
<td>COMP212 Introduction to Programming</td>
</tr>
<tr>
<td></td>
<td>MATH201 Multivariable Calculus</td>
</tr>
<tr>
<td></td>
<td>MATH206 Complex Analysis</td>
</tr>
<tr>
<td></td>
<td>MATH218 Linear Algebra 2 **</td>
</tr>
<tr>
<td></td>
<td>PHYS201 Quantum Mechanics and Electromagnetics</td>
</tr>
<tr>
<td>Semester 2</td>
<td>ELEC220 Electronics 1</td>
</tr>
<tr>
<td></td>
<td>ELEC231 Electrical Circuits</td>
</tr>
<tr>
<td></td>
<td>MATH203 Ordinary Differential Equations</td>
</tr>
<tr>
<td></td>
<td>MECH205 Engineering Computations</td>
</tr>
<tr>
<td>Both Semesters</td>
<td>ELEC210 Introduction to Energy Systems</td>
</tr>
<tr>
<td></td>
<td>MATH231 Dynamics</td>
</tr>
</tbody>
</table>

** Approved Option

Note: MATH217 may replace MATH218

YEAR III

80 credit points selected from the following subjects:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester 1</td>
<td>COMP503 Computer Networks</td>
</tr>
<tr>
<td></td>
<td>MECH271 Thermodynamics</td>
</tr>
</tbody>
</table>

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SECTION FIVE

BACHELOR DEGREE COURSE PROGRAMS

Semester 1 or Semester 2

Mathematics Elective *** 5

Semester 2

ELEC312 Electrical Systems 5
ELEC322 Power Electronics 5
ELEC351 Telecommunications *** 5
MECH382 Engineering Administration 5

Both Semesters

ELEC311 Electrical Power 10
ELEC321 Linear Electronics 10
ELEC350 Communications and Signal Processing 10
ELEC371 Microprocessor Systems 10
ELEC372 Computer Architecture 10
MECH361 Automatic Control 10

*** ELEC351 will not be offered in 1993.

YEAR IV

Semester 1 | Semester 2

General Electives *** 20
Electrical Engineering Electives *** 30
ELEC480 Electrical Engineering Project 30
*** See Elective Requirements listed below

General Course Policies

The attention of students is drawn to the General Course Policies of the Faculty published in the Faculty Policy Section of this Handbook. These policies are particularly important for students intending to enrol in a non-standard program.

Year 1 Mathematics Option

MATH102 assumes attainment of a mark of at least 120/150 in 3 unit Mathematics at the NSW HSC examination. It is expected that students wishing to prepare for anhonours degree and/or for entry to any combined degree program, will take MATH102 and MATH103. It is also recommended that students who successfully complete MATH102 and MATH103, undertake MATH218 in Year II.

Students underprepared for entry to MATH102 may take MATH111 and MATH112 in lieu of MATH102 and MATH103. Those students who successfully complete MATH111 and MATH112 must take MATH217 in lieu of MATH218 in Year II, and may then choose to take MATH218 as the 5cp Mathematics Elective in Year III.

Elective Requirements

The requirements of the each of the three elective categories are given below.

Mathematics Elective (Year III)

One 5 credit point subject is to be selected from those subjects offered by the Department of Mathematics at 200 or 300 level. The prerequisite and corequisite requirements of the selected subject must be satisfied or written permission to enrol gained from the Head of the Department of Mathematics.

Electrical Engineering Electives (Year IV)

A total of 30 credit points (3 subjects) is to be chosen from the listed below.

Subjects Credit Points

ELEC311 Electrical System Design 5
ELEC312 Electrical System Dynamics and Control 5
ELEC341 Electrical Technology 5
ELEC420 VLSI Design 10
ELEC421 Electronics Design 10
ELEC440 Advanced Control 10
ELEC441 Control System Design and Management 10
ELEC453 Digital Communications 10
ELEC454 Engineering Electromagnetics 5
ELEC470 Advanced Computer Architectures 10

Not all Electrical Engineering Electives may be offered in any one year. Students will be advised in September of the preceding year which 400 level elective subjects will be available.

General Electives (Year IV)

Electives may be chosen from any subjects offered within the University at 100, 200, 300 or 400 level provided that prerequisites are met (or written permission obtained from the Head of the Department offering the subject). Recommended electives are listed below.

Subjects Credit Points

ELEC192 Industrial Experience ** 5
ELEC193 Industrial Experience ** 5
ELEC194 Industrial Experience ** 5
ELEC195 Industrial Experience ** 5
MATH202 Partial Differential Equations 5
MATH205 Analysis of Metric Spaces 5
MATH211 Group Theory 5
MATH213 Mathematical Modelling 5
MATH214 Numerical Methods 5
MATH215 Operations Research 5
MATH216 Numerical Analysis 5
MECH382 Engineering Administration* 5
MECH384 Engineering Economics 1* 10
PHIL101 Introduction to Philosophy 20
PHIL391 Technology and Human Values 1* 10

** Preferred General Elective choices.

Industrial Experience subjects may be taken by part-time students after Stage 1.

Prerequisite and Corequisite Requirements

The prerequisite and corequisite requirements of individual subjects are listed in the schedule presented in Section 9 of this Handbook. Enrolment in a subject contrary to the provisions of this schedule will not be approved without the written permission of the Head of the Department offering the subject concerned.

Part-time Attendance

All candidates for the degree must complete the requirements of the Course Program given above. All or part of this program may be completed by part-time attendance. Part-time students will normally take two years for each equivalent full-time year. The

SECTION FIVE

BACHELOR DEGREE COURSE PROGRAMS

first two stages of the courses are timetabled to permit a single-day work release attendance pattern with some evening lectures. These stages are:

Subjects Credit Points

STAGE 1
Semester 1
MATH102 Mathematics 102 * 10
Semester 2
MATH103 Mathematics 103 * 10
Both Semesters
ELEC30 Electrical Engineering 1 10
ELEC70 Computer Engineering 1 10

* Approved Option
See note on Year I Mathematics Option above.

STAGE 2
Semester 1
MECH111 Engineering Drawing 5
PHYS102 Physics 102 10
Semester 2
CIVL111 Mechanics and Structures 5
MECH112 Materials 1 1 5
PHYS103 Physics 103 10
Both Semesters
ELEC101 Introduction to Electrical Engineering 5

After completion of the above program attendance will be required at various times during the day depending on the subjects in which the candidate is enrolled and the requirements of the timetable. Full-time study is recommended after Stage 2. Students considering part-time study are advised to consult the Guide to Attendance Patterns at the beginning of this Section of the Handbook.

Transition Arrangements

The Course Program has been amended with effect from the preceding year. Students undertaking a combined degree program are required to meet the requirements of the new Course Program. The following equivalence between previous subjects and the new subjects will apply.

<table>
<thead>
<tr>
<th>Previous Subjects</th>
<th>New Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP202</td>
<td>COMP212</td>
</tr>
<tr>
<td>ELEC101</td>
<td>ELEC101</td>
</tr>
<tr>
<td>ELEC230</td>
<td>ELEC210 and ELEC231</td>
</tr>
<tr>
<td>ELEC310</td>
<td>ELEC311 and ELEC312</td>
</tr>
<tr>
<td>ELEC320</td>
<td>ELEC321 and ELEC322</td>
</tr>
<tr>
<td>ELEC350 *</td>
<td>ELEC350</td>
</tr>
<tr>
<td>ELEC370</td>
<td>ELEC371 and ELEC372</td>
</tr>
<tr>
<td>ELEC410</td>
<td>ELEC411 and ELEC412</td>
</tr>
<tr>
<td>ELEC420</td>
<td>ELEC420</td>
</tr>
<tr>
<td>ELEC450</td>
<td>ELEC453 and ELEC454</td>
</tr>
<tr>
<td>ELEC470</td>
<td>ELEC470</td>
</tr>
<tr>
<td>ELEC480</td>
<td>ELEC480</td>
</tr>
</tbody>
</table>

MECH101

* Students who completed ELEC250 Communications prior to 1992 who intended to undertake ELEC450 Advanced Communications may undertake ELEC380 and ELEC453.

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

Combined Degree Programs

Combined degree programs are available which allow completion of the requirements for the Bachelor of Engineering (BE) degree in the specialisation of Electrical Engineering together with the requirements for a degree of Bachelor of Mathematics (BMath) or Bachelor of Science (BSc) (Physics Major) by a minimum of 5 years full-time study. The subjects undertaken in the first year of study of each program are identical to those required in the Electrical Engineering program except that the inclusion of MATH102 and MATH103 is required.

Note that students undertaking a combined degree program are attempting two distinct programs concurrently and therefore the annual enrolment required by such a program may exceed the normal annual load of 80 credit points. Also note that HECS will be calculated on the basis of the proportion which each individual subject counts in the program. The separate degree of Electrical Engineering shall not be calculated at a proportion of 100%.

Direct entry to combined programs may be gained via UAC by applicants who attain a TBR of 92.5 at the NSW HSC (or equivalent). Students may also enter combined degree programs at the conclusion of Year 11 if they have achieved a WAM of 70. Application should be made in conjunction with submission of the re-enrolment application. The Faculty Office may be consulted regarding application forms and course requirements.
Environmental Engineering

Degree: Bachelor of Engineering (BE) awarded in the specialisation of Environmental Engineering
Designated Department: Department of Civil Engineering and Surveying
Course Coordinator: Dr B.J. Williams

Course Program

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>YEAR I</td>
<td></td>
</tr>
<tr>
<td>Semester 1</td>
<td></td>
</tr>
<tr>
<td>CIVL111</td>
<td>Mechanics and Structures 5</td>
</tr>
<tr>
<td>MATH111</td>
<td>Mathematics 111 * 10</td>
</tr>
<tr>
<td>MECH212</td>
<td>Materials 1 5</td>
</tr>
<tr>
<td>PHYS101</td>
<td>Physics 101 * 10</td>
</tr>
<tr>
<td>SURV111</td>
<td>Surveying 1 10</td>
</tr>
<tr>
<td>Semester 2</td>
<td></td>
</tr>
<tr>
<td>CIVL131</td>
<td>Fluid Mechanics 1 5</td>
</tr>
<tr>
<td>MATH112</td>
<td>Mathematics 112 * 10</td>
</tr>
<tr>
<td>MECH102</td>
<td>Programming 5</td>
</tr>
<tr>
<td>MECH111</td>
<td>Engineering Drawing 5</td>
</tr>
<tr>
<td>SURV112</td>
<td>Surveying 2 10</td>
</tr>
<tr>
<td>CIVL141</td>
<td>Environmental Engineering 1 5</td>
</tr>
<tr>
<td></td>
<td>FIVE</td>
</tr>
</tbody>
</table>

* Approved Options
1. MATH112 and MATH103 may replace MATH111 and MATH112.
2. PHYS102 may replace PHYS101.

YEAR II

| Semester 1 |            |
| BIOL101   | Plant and Animal Biology 10 |
| CHEM101   | Chemistry 101 10 |
| CIVL232   | Fluid Mechanics 2 5 |
| MATH202   | Multivariable Calculus 5 |
| GEO101    | The Environment 10 |
| Semester 2 |            |
| BIOL202   | Cell Biology, Genetics and Evolution 10 |
| CHEM102   | Chemistry 102 10 |
| CIVL233   | Fluid Mechanics 3 5 |
| MATH203   | Ordinary Differential Equations 1 5 |
| MECH205   | Engineering Computations 5 |
| CIVL242   | Environmental Engineering 2 5 |
|          | FIVE         |

| Semester 3 |            |
| CHEM251   | Environmental Chemistry 10 |
| CIVL354   | Open Channel Hydraulics 5 |
| CIVL381   | Statistical Methods 5 |
| ECON371   | Economic Principles 10 |
| Electives | 10          |

YEAR III

| Semester 1 |            |
| BIOL201   | Biochemistry 10 |
| BIOL202   | Animal Physiology 10 |
| BIOL204   | Cell and Molecular Biology 10 |
| BIOL205   | Molecular Genetics 10 |
| BIOL206   | Plant Physiology 10 |
| BIOL301   | Cell Processes 10 |
| BIOL303   | Environmental Plant Physiology 10 |
| CHEM221   | Inorganic Chemistry 10 |
| CHEM223   | Organic Chemistry 10 |
| CHEM321   | Inorganic Chemistry 10 |
| CHEM331   | Organic Chemistry 10 |
| CHEM361   | Environmental Chemistry 10 |
| CHEE264   | Transfer Principles 2 10 |
| CHEE354   | Biotechnology 5 |
| CHEE372   | Separation Processes 10 |

Prerequisite and Corequisite Requirements

The prerequisite and corequisite requirements of individual subjects are listed in the schedule presented in Section 9 of this Handbook. Enrolment in a subject contrary to the provisions of this schedule will not be approved without the written permission of the head of the Department offering the subject concerned.

Part-time Attendance

All candidates for the degree must complete the requirements of the Course Program given above. All or part of this program may be completed by part-time attendance. Part-time students will normally take two years for each equivalent full-time year. The first two stages of the course are timetabled to permit a single-day work release attendance pattern with some evening lectures. These stages are:
<table>
<thead>
<tr>
<th>Semester 2</th>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ELEC211 Electrical Energy Conversion</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MATH202 Partial Differential Equations</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MATH203 Engineering Administration</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MATH204 Quality Engineering</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MATH205 Computer Aided Manufacturing</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MATH206 Operations Research</td>
<td>5</td>
</tr>
<tr>
<td>Both Semesters</td>
<td>MECH201 Automatic Control</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>PHYSI101 Technology and Human Values</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YEAR IV</td>
<td>Semester 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MECH203 Production Scheduling</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MECH204 Robotics</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MECH205 Engineering Economics</td>
<td>5</td>
</tr>
<tr>
<td>Both Semesters</td>
<td>MECH206 Project/Seminar</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>40</td>
</tr>
</tbody>
</table>

**General Course Policies**

The attention of students is drawn to the General Course Policies of the Faculty published in the Faculty Policy Section of this Handbook. These policies are particularly important for students intending to enrol in a non-standard program.

**Elective Requirements**

At least 6 credit points of Elective must be taken at 300 level. Electives must be chosen from the list of Approved Elective Subjects given below. Not all electives may be offered in any one year and the entry requirements for selected subjects must be met. Students will be advised in September of the preceding year which MECH 300 and 400 level elective subjects will be available.

**Approved Elective Subjects**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part-time Attendance**

All candidates for the degree must complete the requirements of the Course Program given above. All or part of this program may be completed by part-time attendance. Part-time students will normally take two years for each equivalent full-time year. The first two stages of the course are timetabled to permit a single-day work week attendance pattern with some evening lectures. These stages are:

**Subjects**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Combined Degree Programs**

A combined degree program is available which allows completion of the requirements of the Bachelor of Engineering (BE) degree in the specialisation of Industrial Engineering together with the
requirements for a degree of Bachelor of Computer Science (BCompSc).

Note that students undertaking a combined degree program are attempting two distinct programs concurrently and therefore the annual enrolment required by such a program may exceed the normal annual load of 80 credit points. Also note that BECS will be calculated on the basis of the proportion which each individual subject counts in the program. In the schedule presented, both forms part and not on the proportion it contributes to any combined degree program. Timetabling constraints may limit the choice of optional subjects.

Direct entry to combined programs may be gained via UAC by applicants who achieve highly at the NSW HSC (or equivalent). Such students may complete the program by a minimum of 5 years full-time study. The subjects studied in Year I of the combined program will be CIVL111, COMP101, ELEC130, ELEC170, MATH102, MATH103, MECH101, MECH111 and MECH121 (80 credit points).

Students may also enter combined degree programs at the conclusion of Year I if they have achieved a WAM of 70 but may require more than 5 years to complete the requirements of the combined program. Application should be made in conjunction with submission of the re-enrolment application. The Faculty Office may be consulted regarding application forms and course requirements.

### Mechanical Engineering

**Degree:** Bachelor of Engineering (BE) awarded in the specialisation of Mechanical Engineering

**Designated Department:** Department of Mechanical Engineering

**Course Coordinator:** Mr J.W. Hayes

#### Course Program

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>YEAR I</strong></td>
<td></td>
</tr>
<tr>
<td>Semester 1</td>
<td></td>
</tr>
<tr>
<td>MATH111</td>
<td>Mathematics 111</td>
</tr>
<tr>
<td>MECH102</td>
<td>Programming</td>
</tr>
<tr>
<td>MECH103</td>
<td>Engineering Chemistry</td>
</tr>
<tr>
<td>MECH111</td>
<td>Engineering Drawing</td>
</tr>
<tr>
<td>PHYS101</td>
<td>Physics 101</td>
</tr>
<tr>
<td>Semester 2</td>
<td></td>
</tr>
<tr>
<td>CIVL111</td>
<td>Mechanics and Structures</td>
</tr>
<tr>
<td>MATH112</td>
<td>Mathematics 112</td>
</tr>
<tr>
<td>MECH101</td>
<td>Introduction to Mechanical Engineering</td>
</tr>
<tr>
<td>MECH121</td>
<td>Materials 1</td>
</tr>
<tr>
<td>PHYS102</td>
<td>Physics 102</td>
</tr>
<tr>
<td><strong>YEAR II</strong></td>
<td></td>
</tr>
<tr>
<td>Semester 1</td>
<td></td>
</tr>
<tr>
<td>MATH120</td>
<td>Multivariable Calculus</td>
</tr>
<tr>
<td>MECH124</td>
<td>Experimental Methods 1</td>
</tr>
<tr>
<td>MECH241</td>
<td>Mechanics of Solids 1</td>
</tr>
<tr>
<td>MECH271</td>
<td>Thermodynamics 1</td>
</tr>
<tr>
<td>STA105</td>
<td>Engineering Statistics</td>
</tr>
<tr>
<td>Semester 2</td>
<td></td>
</tr>
<tr>
<td>MATH123</td>
<td>Ordinary Differential Equations 1</td>
</tr>
<tr>
<td>MECH125</td>
<td>Engineering Computations</td>
</tr>
<tr>
<td>MECH212</td>
<td>Design of Machine Comps...rnts</td>
</tr>
<tr>
<td>MECH222</td>
<td>Materials 2</td>
</tr>
<tr>
<td>MECH251</td>
<td>Fluid Mechanics 1</td>
</tr>
<tr>
<td><strong>Year I</strong></td>
<td></td>
</tr>
<tr>
<td>MECH21</td>
<td>Mechanical Engineering Design 1</td>
</tr>
<tr>
<td>MECH232</td>
<td>Dynamics</td>
</tr>
<tr>
<td>ELEC130</td>
<td>Electrical Engineering 1</td>
</tr>
<tr>
<td><strong>YEAR III</strong></td>
<td></td>
</tr>
<tr>
<td>Semester 1</td>
<td></td>
</tr>
<tr>
<td>MECH323</td>
<td>Materials 3</td>
</tr>
<tr>
<td>Semester 2</td>
<td></td>
</tr>
<tr>
<td>ELEC211</td>
<td>Electrical Energy Conversion</td>
</tr>
<tr>
<td>MATH202</td>
<td>Partial Differential Equations 1</td>
</tr>
</tbody>
</table>

### BACHELOR DEGREE COURSE PROGRAMS

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH21</td>
<td>Linear Algebra 1</td>
<td>5</td>
</tr>
<tr>
<td>MATH191</td>
<td>Industrial Experience</td>
<td>5</td>
</tr>
<tr>
<td>MATH192</td>
<td>Industrial Experience</td>
<td>5</td>
</tr>
<tr>
<td>MATH193</td>
<td>Industrial Experience</td>
<td>5</td>
</tr>
<tr>
<td>MATH205</td>
<td>Numerical Methods</td>
<td>5</td>
</tr>
<tr>
<td>MATH209</td>
<td>Noise Pollution and Control</td>
<td>5</td>
</tr>
<tr>
<td>CIVL315</td>
<td>Computer Aided Design</td>
<td>5</td>
</tr>
<tr>
<td>CIVL319</td>
<td>Finite Element Design</td>
<td>5</td>
</tr>
<tr>
<td>CIVL317</td>
<td>Bulk Materials Handling 1</td>
<td>5</td>
</tr>
<tr>
<td>CIVL318</td>
<td>Conveying of Bulk Solids</td>
<td>5</td>
</tr>
<tr>
<td>CIVL324</td>
<td>Ceramic Science and Technology</td>
<td>5</td>
</tr>
<tr>
<td>CIVL325</td>
<td>Polymer Science and Technology</td>
<td>5</td>
</tr>
<tr>
<td>CIVL326</td>
<td>Fabrication of Metals</td>
<td>5</td>
</tr>
<tr>
<td>CIVL381</td>
<td>Methods Engineering</td>
<td>5</td>
</tr>
<tr>
<td>CIVL382</td>
<td>Engineering Administration</td>
<td>5</td>
</tr>
<tr>
<td>CIVL383</td>
<td>Quality Engineering</td>
<td>5</td>
</tr>
<tr>
<td>CIVL384</td>
<td>Engineering Economics</td>
<td>5</td>
</tr>
<tr>
<td>CIVL386</td>
<td>Computer Aided Manufacturing</td>
<td>5</td>
</tr>
<tr>
<td>CIVL387</td>
<td>Operations Research 1</td>
<td>5</td>
</tr>
<tr>
<td>CIVL388</td>
<td>Operations Research 2</td>
<td>5</td>
</tr>
<tr>
<td>CIVL405</td>
<td>Computation of Turbulent Flows</td>
<td>5</td>
</tr>
<tr>
<td>CIVL407</td>
<td>Environmental Engineering</td>
<td>5</td>
</tr>
<tr>
<td>CIVL408</td>
<td>Machine Condition Monitoring</td>
<td>5</td>
</tr>
<tr>
<td>CIVL412</td>
<td>Bulk Materials Handling 2</td>
<td>5</td>
</tr>
<tr>
<td>CIVL418</td>
<td>Management Maintenance</td>
<td>5</td>
</tr>
<tr>
<td>CIVL421</td>
<td>Composites in Engineering</td>
<td>5</td>
</tr>
<tr>
<td>CIVL431</td>
<td>Robotics</td>
<td>5</td>
</tr>
<tr>
<td>CIVL453</td>
<td>Introduction to Turbofans</td>
<td>5</td>
</tr>
<tr>
<td>CIVL473</td>
<td>Thermodynamics 3</td>
<td>5</td>
</tr>
<tr>
<td>CIVL474</td>
<td>Heat Transfer 2</td>
<td>5</td>
</tr>
<tr>
<td>CIVL484</td>
<td>Engineering Economics 2</td>
<td>5</td>
</tr>
<tr>
<td>CIVL485</td>
<td>Production Scheduling</td>
<td>5</td>
</tr>
<tr>
<td>CIVL497</td>
<td>Directed Reading</td>
<td>10</td>
</tr>
<tr>
<td>CIVL498</td>
<td>Directed Reading</td>
<td>10</td>
</tr>
<tr>
<td>PHIL392</td>
<td>Technology and Human Values 2</td>
<td>10</td>
</tr>
<tr>
<td><strong>General Electives</strong>*</td>
<td>maximum of 20</td>
<td></td>
</tr>
</tbody>
</table>

*Industrial Experience subjects may be taken by part-time students after stage I.

**MECH497 and MECH498 are normally taken as substantial extensions to MECH496. Supervision must be arranged and the written permission of the Head of the Department obtained before enrolment will be permitted in these subjects.

***General Electives may be any subject(s) offered within the University at 100, 200, 300 or 400 level provided the prerequisites are met (or written permission obtained from the Head of the Department offering the subject).**

### Prerequisite and Corequisite Requirements

The prerequisite and corequisite requirements of individual subjects are listed in the schedule presented in Section 9 of this Handbook. These rules are particularly important for students intending to enrol in a non-standard program.

#### Elective Requirements

Electives must be chosen from the list of Approved Elective Subjects given below. A minimum of 10 credit points must be selected from the MECH 400 level subjects listed. Not all electives may be offered in any one year. Students will be advised in September of the preceding year which MATH 300 and 400 level elective subjects will be available.

**Approved Elective Subjects**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH204</td>
<td>Real Analysis</td>
<td>5</td>
</tr>
<tr>
<td>MATH206</td>
<td>Complex Analysis 1</td>
<td>5</td>
</tr>
</tbody>
</table>
SECTION FIVE

BACHELOR DEGREE COURSE PROGRAMS

first two stages of the course are timetabled to permit a single-day work release attendance pattern with some evening lectures. These stages are:

**Subjects**

| STAGE 1 | Semester 1 | MATH111 Mathematics 111 | 10 |
|         | Semester 2 | MECH111 Engineering Drawing | 5 |
|         | Semester 2 | CIVIL111 Mechanics and Structures | 5 |
|         | Semester 2 | MATH112 Mathematics 112 | 5 |
|         | Semester 2 | MECH103 Engineering Chemistry | 5 |
|         | Both Semesters | MECH101 Introduction to Engineering | 5 |

| STAGE 2 | Semester 1 | MECH102 Programming | 5 |
|         | Semester 1 | PHYS101 Physics 101 | 5 |
|         | Semester 2 | MECH121 Materials 1 | 5 |
|         | Semester 2 | PHYS102 Physics 102 | 5 |
|         | Both Semesters | ELECT170 Computer Engineering 1 | 5 |

* Approved Options
1. MATH102 and MATH103 may replace MATH111 and MATH112.
2. PHYS102 and PHYS103 may replace PHYS101 and PHYS102.

After completion of the above program attendance will be required at various times during the day depending upon the subjects in which the candidate is enrolled and the requirements of the timetable. Full-time study is recommended after Stage 2. Students considering part-time study are advised to consult the Guide to Attendance Patterns at the beginning of this Section of the Handbook.

**Transition Arrangements**

The Course Program has been amended with effect from the commencement of the 1993 academic year. All students enrolled in this course or any combined degree program of which it forms part, are required to meet the requirements of the new Course Program. The following equivalence between previous subjects and new subjects will apply.

<table>
<thead>
<tr>
<th>Previous subject</th>
<th>New Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECH101</td>
<td>MECH101</td>
</tr>
<tr>
<td>MECH213</td>
<td>MECH211 and MECH212</td>
</tr>
</tbody>
</table>

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

**Combined Degree Programs**

A combined degree program is available which allows completion of the requirements for the Bachelor of Engineering (BE) degree in the specialisation of Mechanical Engineering together with the requirements for a degree of Bachelor of Mathematics (BMath) by a minimum of 5 years full-time study. The subjects undertaken in the first year of study of the program are identical to those required in the Mechanical Engineering program except that the inclusion of MATH102 and MATH103 is required.

Note that students undertaking a combined degree program are attempting two distinct programs concurrently and therefore the annual enrolment required by such a program may exceed the normal annual load of 80 credit points. Also note that HBCS cannot be calculated on the basis of the proportion which each individual subject counts in the program of the separate degree of which it forms part and not on the proportion it contributes to any combined degree program. Timetabling constraints may limit the choice of optional subjects.

Direct entry to the combined program may be gained via UAC by applicants who achieve highly at the NSW HSC (or equivalent). Students may also enter combined degree programs at the conclusion of Year 1 if they have achieved a WAM of 70. Application should be made in conjunction with submission of the re-enrolment application. The Faculty Office may be consulted regarding application forms and course requirements.

**Course Program**

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVIL11</td>
<td>5</td>
</tr>
<tr>
<td>MATH111</td>
<td>10</td>
</tr>
<tr>
<td>MECH121</td>
<td>5</td>
</tr>
<tr>
<td>PHYS101</td>
<td>5</td>
</tr>
<tr>
<td>SURV112</td>
<td>5</td>
</tr>
</tbody>
</table>

* Approved Options
1. MATH102 and MATH103 may replace MATH111 and MATH112.
2. PHYS102 may replace PHYS101.

**Year I**

| Semester 1 | CIVIL11 Mechanics and Structures | 5 |
| Semester 1 | MATH111 Mathematics 111 | 5 |
| Semester 1 | MECH121 Materials 1 | 5 |
| Semester 1 | SURV112 Surveying | 5 |
| Semester 2 | CIVIL11 Fluid Mechanics 1 | 5 |
| Semester 2 | MATH112 Mathematics 112 | 5 |
| Semester 2 | MECH102 Programming | 5 |
| Semester 2 | MECH111 Engineering Drawing | 5 |
| Semester 2 | SURV112 Surveying 2 | 5 |

**Year II**

| Semester 1 | CIVIL21 Mechanics of Solids | 5 |
| Semester 1 | CIVIL22 Geotechnical Investigation | 5 |
| Semester 1 | LAW201 Legal Process | 5 |
| Semester 1 | MATH101 Multivariable Calculus | 5 |
| Semester 1 | SURV214 Optics and Mining Surveying | 5 |
| Semester 2 | CIVIL215 Systems | 5 |
| Semester 2 | LAW201 Property and Survey Law | 5 |
| Semester 2 | MATH103 Ordinary Differential Equations I | 5 |
| Semester 2 | SURV213 Surveying 3 | 5 |
| Semester 2 | SURV215 Electronic Distance Measurement | 5 |
| Semester 2 | SURV233 Survey Computations | 5 |
| Both Semesters | CIVIL271 Transportation Engineering | 5 |

**Year III**

| Semester 1 | CIVIL325 Soil Mechanics I | 5 |
| Semester 1 | CIVIL381 Statistical Methods | 5 |
| Semester 1 | ECON371 Principles of Economics | 5 |
| Semester 1 | SURV316 Hydrographic Surveying | 5 |
| Semester 1 | SURV334 Surveying 2 | 5 |
| Semester 1 | SURV351 Geodesy 1 | 5 |

**Year IV**

| Semester 1 | CIVIL413 Water Resources Engineering | 5 |
| Semester 1 | SURV417 Industrial and Other Surveying | 5 |
| Semester 2 | ELECH414 Environmental Engineering 1 | 5 |
| Semester 2 | MECH112 Mathematics 112 | 5 |
| Semester 2 | MECH102 Programming | 5 |
| Semester 2 | MECH111 Engineering Drawing | 5 |
| Semester 2 | SURV112 Surveying 2 | 5 |

**Recommended Elective Subjects**

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURV191 Industrial Experience</td>
<td>5</td>
</tr>
<tr>
<td>SURV192 Industrial Experience</td>
<td>5</td>
</tr>
<tr>
<td>SURV193 Industrial Experience</td>
<td>5</td>
</tr>
<tr>
<td>SURV452 Geodesy</td>
<td>5</td>
</tr>
<tr>
<td>SURV460 Photogrammetry</td>
<td>5</td>
</tr>
<tr>
<td>SURV463 Advanced Cartography</td>
<td>5</td>
</tr>
<tr>
<td>SURV498 Special Topic</td>
<td>5</td>
</tr>
<tr>
<td>SURV499 Special Topic</td>
<td>5</td>
</tr>
<tr>
<td>CIVIL222 Materials 2</td>
<td>5</td>
</tr>
<tr>
<td>CIVIL223 Materials 3</td>
<td>5</td>
</tr>
<tr>
<td>CIVIL233 Fluid Mechanics 3</td>
<td>5</td>
</tr>
<tr>
<td>CIVIL242 Environmental Engineering 2</td>
<td>5</td>
</tr>
<tr>
<td>CIVIL334 Open Channel Hydraulics</td>
<td>5</td>
</tr>
<tr>
<td>MATH103 Mathematics 103</td>
<td>10</td>
</tr>
<tr>
<td>MATH102 Partial Differential Equations</td>
<td>10</td>
</tr>
<tr>
<td>MATH102 Experimental Methods</td>
<td>10</td>
</tr>
<tr>
<td>PHIL391 Technology and Human Values</td>
<td>10</td>
</tr>
</tbody>
</table>

Note: May be taken by part-time students after stage 1.
Prerequisite and Corequisite Requirements

The prerequisite and corequisite requirements of individual subjects are listed in the schedule presented in Section 9 of this Handbook. Enrolment in a subject contrary to the provisions of this schedule will not be approved without the written permission of the Head of the Department offering the subject concerned.

Part-time Attendance

All candidates for the degree must complete the requirements of the Course Program given above. All or part of this program may be completed by part-time attendance. Part-time students will normally take two years for each equivalent full-time year. The first two stages of the course are timetabled to permit a single-day work release attendance pattern with some evening lectures. These stages are:

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAGE 1</td>
<td></td>
</tr>
<tr>
<td>Semester 1</td>
<td></td>
</tr>
<tr>
<td>MATH111 Mathematics 111</td>
<td>10</td>
</tr>
<tr>
<td>SURV111 Surveying I</td>
<td>10</td>
</tr>
<tr>
<td>Semester 2</td>
<td></td>
</tr>
<tr>
<td>MATH112 Mathematics 112</td>
<td>10</td>
</tr>
<tr>
<td>SURV112 Surveying 2</td>
<td>10</td>
</tr>
<tr>
<td>PHYS101 Physics 101</td>
<td>10</td>
</tr>
<tr>
<td>Semester 3</td>
<td></td>
</tr>
<tr>
<td>CIVL111 Mechanics and Structures</td>
<td>5</td>
</tr>
<tr>
<td>MEC1121 Materials 1</td>
<td>5</td>
</tr>
<tr>
<td>PHYS102 Physics 102</td>
<td>5</td>
</tr>
<tr>
<td>Semester 4</td>
<td></td>
</tr>
<tr>
<td>CIVL131 Fluid Mechanics 1</td>
<td>5</td>
</tr>
<tr>
<td>CIVL141 Environmental Engineering</td>
<td>5</td>
</tr>
<tr>
<td>MEC1101 Programming</td>
<td>5</td>
</tr>
<tr>
<td>MEC1111 Engineering Drawing</td>
<td>5</td>
</tr>
<tr>
<td>* Approved Options</td>
<td></td>
</tr>
<tr>
<td>1. MATH112 and MATH113 can replace MATH111 and MATH112.</td>
<td></td>
</tr>
<tr>
<td>2. PHYS102 may replace PHYS101.</td>
<td></td>
</tr>
</tbody>
</table>

After completion of the above program attendance will be required at various times during the day depending upon the subjects in which the candidate is enrolled and the requirements of the timetable. Full-time study is recommended after the second stage. Students considering part-time study are advised to consult the Guide to Attendance Patterns at the beginning of this Section of the Handbook.

Combined BE/BSurv Degree Program

The combined degree program allows completion of the requirements for the Bachelor of Engineering (BE) degree in the specialisation of Civil Engineering together with the requirements for a degree of Bachelor of Surveying (BSurv) degree in a minimum of 5 years full-time study.

Note that students undertaking a combined degree program are attempting two distinct programs concurrently and therefore the annual enrolment required by such a program may exceed the normal annual load of 80 credit points. Also note that HECS will be calculated on the basis of the proportion which each individual subject counts in the program of the separate degree of which it forms part and not on the proportion it contributes to any combined degree program.

Students normally apply to enter combined degree programs at the conclusion of Year 1. Students who have completed the first year of either the Surveying or Civil Engineering program and have attained a weighted average mark (WAM) of 55 for entry may be admitted. Application should be made in conjunction with submission of the re-enrolment application. The Faculty Office may be consulted regarding application forms and course requirements. The Course Coordinator may be consulted regarding course requirements.

The detailed requirements are set out below:

Year I: Year I of either the Surveying or Civil Engineering program (Total 80 credit points).

Year II: CIVL212, CIVL213, CIVL222, CIVL223, CIVL224, CIVL232, CIVL233, CIVL242, CIVL251, CIVL271, MATH201, MATH202, MEC1205, SURV214, SURV215, SURV233 (Total 90 credit points).

Year III: CIVL314, CIVL316, CIVL317, CIVL325, CIVL326, CIVL327, LAW291, LAW292, SURV213, SURV334, SURV399, PHIL391 or ECON371 (Total 85 credit points).

Year IV: CIVL315, CIVL334, CIVL342, CIVL352, CIVL361, CIVL382, SURV316, SURV351, SURV361, SURV362, SURV417, SURV418, SURV441 (Total 85 credit points).

Year V: CIVL411, CIVL420, CIVL443, CIVL453, CIVL454, SURV472, SURV473, CIVL455 or SURV481 (Total 85 credit points).

MASTER AND DOCTORAL DEGREE RULES

About This Section

This section contains the 1991 Rules which, at the time of printing, govern the following postgraduate degrees offered in the Faculty of Engineering:

- Master of Computer Science
- Master of Computing
- Master of Engineering
- Master of Engineering Science
- Master of Surveying
- Doctor of Philosophy

REVIEW OF REQUIREMENTS

The Rules appearing in this section were under review at the time of printing. It is not expected that admission requirements or the general provisions of coursework requirements will alter substantially. However, students enrolled in 1993 should ensure that they are aware of the relevant provisions of the new Rules which are expected to be operative from 1993.

Rules Governing Masters Degrees

Part 1 – General

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

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

- a “Faculty Board” means the Faculty Board of the Faculty responsible for the course in which a person is enrolled or is proposing to enrol;
- a “program” means the program of research and study prescribed in the Schedule;
- a “Schedule” means the Schedule of these Rules pertaining to the course in which a person is enrolled or is proposing to enrol;
- a “thesis” means any thesis or dissertation submitted by a candidate.

(c) These Rules shall not apply to degrees conferred honoris causa.

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

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

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

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

MASTER AND DOCTORAL DEGREE RULES

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

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

(a) have satisfied the requirements for admission to a four year full-time or equivalent part-time Bachelor's degree in Engineering or Metallurgy from the University of Newcastle or any other approved university; or

(b) have satisfied the requirements for admission to a three year full-time or equivalent part-time Bachelor's degree of the University of Newcastle or any other approved university and have completed to the satisfaction of the Faculty Board such work and examinations as determined by the Faculty Board; or

(c) have satisfied the requirements for admission to a degree in any tertiary institution other than the University of Newcastle or any other approved university and have completed to the satisfaction of the Faculty Board such work and examinations as determined by the Faculty Board.

SCHEDULE 6 — MASTER OF ENGINEERING

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

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

(a) have satisfied the requirements for admission to a degree in any tertiary institution other than the University of Newcastle or any other approved university and have completed to the satisfaction of the Faculty Board such work and examinations as determined by the Faculty Board; or

(b) have satisfied the requirements for admission to a degree in any tertiary institution other than the University of Newcastle or any other approved university and have completed to the satisfaction of the Faculty Board such work and examinations as determined by the Faculty Board.
SCHEDULE 17 — MASTER OF COMPUTER SCIENCE

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

2. To be eligible for admission to candidature an applicant shall:
   (a) have satisfied all the requirements for admission to the degree of Bachelor of Computer Science with honours class I or class II of the University of Newcastle or to an honours degree, approved for this purpose by the Faculty Board, of the University of Newcastle or any other 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 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; or
   (c) in exceptional cases produce evidence of possessing such academic or professional qualifications as may be approved by the Faculty Board on the recommendation of the Head of the Department of Electrical Engineering and Computer Science; and
   (d) complete such additional work and pass such examinations as the Faculty Board may determine.

3. (a) To qualify for admission to the degree a candidate shall:
   (i) have satisfied all the requirements for admission to the degree of Bachelor of Computer Science with honours class I or II of the University of Newcastle or to an honours degree, approved for this purpose by the Faculty Board; or
   (ii) in exceptional cases produce evidence of possessing such academic or professional qualifications as may be approved by the Faculty Board on the recommendation of the Head of the Department of Electrical Engineering and Computer Science; and
   (b) complete the program in not less than two and not more than five calendar years from its commencement.

4. The Faculty of Engineering shall be responsible for the course leading to the degree of Master of Computing.

5. To be eligible for admission to candidature an applicant shall:
   (a) have satisfied all the requirements for admission to the degree of Bachelor of Computer Science with honours class I or II of the University of Newcastle or to an honours degree, approved for this purpose by the Faculty Board; 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 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; or
   (c) in exceptional cases produce evidence of possessing such academic or professional qualifications as may be approved by the Faculty Board on the recommendation of the Head of the Department of Electrical Engineering and Computer Science; and
   (d) complete such additional work and pass such examinations as the Faculty Board may determine.

6. The Faculty of Engineering shall be responsible for the course leading to the degree of Master of Computing.

7. To be eligible for admission to candidature an applicant shall:
   (a) have satisfied all the requirements for admission to the degree of Bachelor of Computer Science with honours class I or II of the University of Newcastle or to an honours degree, approved for this purpose by the Faculty Board; 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 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; or
   (c) in exceptional cases produce evidence of possessing such academic or professional qualifications as may be approved by the Faculty Board on the recommendation of the Head of the Department of Electrical Engineering and Computer Science; and
   (d) complete such additional work and pass such examinations as the Faculty Board may determine.

8. The Faculty of Engineering shall be responsible for the course leading to the degree of Master of Computing.

9. To be eligible for admission to candidature an applicant shall:
   (a) have satisfied all the requirements for admission to the degree of Bachelor of Computer Science with honours class I or II of the University of Newcastle or to an honours degree, approved for this purpose by the Faculty Board; 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 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; or
   (c) in exceptional cases produce evidence of possessing such academic or professional qualifications as may be approved by the Faculty Board on the recommendation of the Head of the Department of Electrical Engineering and Computer Science; and
   (d) complete such additional work and pass such examinations as the Faculty Board may determine.

10. The Faculty of Engineering shall be responsible for the course leading to the degree of Master of Computing.

11. To be eligible for admission to candidature an applicant shall:
   (a) have satisfied all the requirements for admission to the degree of Bachelor of Computer Science with honours class I or II of the University of Newcastle or to an honours degree, approved for this purpose by the Faculty Board; 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 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; or
   (c) in exceptional cases produce evidence of possessing such academic or professional qualifications as may be approved by the Faculty Board on the recommendation of the Head of the Department of Electrical Engineering and Computer Science; and
   (d) complete such additional work and pass such examinations as the Faculty Board may determine.
c) Examination of Candidates
   (i) recommending to the Senate the examiners to be appointed by the Senate;
   (ii) considering, before the acceptance of the thesis for examination, the report of the supervisor certifying the fitness or otherwise of the thesis for examination and determining the course of action should the report be unfavourable;
   (iii) receiving the reports of examiners and in the light of these and any subsequent reports recommending to the Senate Review Committee that the degree be conferred or not conferred.

d) Reporting to Faculty Board
   (i) informing the Faculty Board from time to time of the policies it has adopted in respect of (a), (b) and (c) above;
   (ii) noting any comments made by the Faculty Board and, where it considers it appropriate, seeking the advice of the Faculty Board on any policies adopted or envisaged.

4. Where the examiners' reports received by the Doctoral Degree Committee contain recommendations which are not unanimous the Committee may before making any recommendation under Rule 5(iii) of these Rules take one or more of the following actions, namely
   (a) review the reasons expressed by the examiners for their recommendations;
   (b) direct that the candidate undertake such further examinations either oral, written or practical as the Committee may specify;
   (c) recommend that the Senate appoint a further examiner who may or may not be appointed as an adjudicator;
   (d) invite the examiners to confer, either in writing or in person, with each other or with the Committee with a view to the presentation of a consolidated recommendation.

Senate Review Committee
5. (a) There shall be a Doctoral Degree Review Committee of the Senate consisting of the Deputy Chairman of the Senate who shall preside at meetings of the Committee and two members to be appointed by the Senate on the nomination of the Deputy Chairman of the Senate.
   (b) The number of members constituting a quorum of the Committee shall be two.
   (c) The two members appointed by the Senate shall hold office for three years from the date of appointment and shall be eligible for reappointment.
   (d) In the event of a casual vacancy, a new member shall be appointed by the Senate on the nomination of the Deputy Chairman of the Senate and shall hold office for the residue of the predecessor's term of office.
   (e) The Senate Review Committee shall be responsible for

SECTION VI

MASTERS AND DOCTORAL DEGREE RULES

(b) Notwithstanding the provisions of subsection (a) of this section, a candidate may be granted special permission by the Doctoral Degree Committee to spend a period of not more than one year in research at another institution approved by the Doctoral Degree Committee.

5. The candidate and the supervisor shall submit to the Doctoral Degree Committee annual reports on the candidate's progress. If after considering these reports, the Committee is of the opinion that the candidate is not making satisfactory progress towards the degree then the Committee may terminate the candidature or place such conditions on the continuation of the candidature as it deems fit.

6. Not later than one year after admission to candidature the candidate shall submit the subject of a thesis for approval by the Doctoral Degree Committee. After the subject has been approved it may be changed only with the permission of the Doctoral Degree Committee.

7. On completing the program every candidate shall submit a thesis which complies with the following requirements:
   (a) the greater proportion of the work described must have been completed by the candidate subsequent to admission to candidature for the degree;
   (b) it must be a significant contribution to the knowledge of the subject;
   (c) it must be written in English or in a language approved by the Doctoral Degree Committee and reach a satisfactory standard of literary presentation;
   (d) it must consist of the candidate's own account of the research undertaken by the candidate. In special cases work done conjointly with other persons may be accepted provided the Doctoral Degree Committee is satisfied on the candidate's part in the joint research; and
   (e) it must not contain as its main content any work or material which has previously been submitted for a university degree or other similar qualification unless the Doctoral Degree Committee otherwise permits.

8. The candidate shall give in writing to the Secretary to the University three months' notice of intention to submit the thesis and such notice shall be accompanied by any prescribed fee.

9. The candidate shall comply with the following provisions concerning the presentation of the thesis:
   (a) the thesis shall contain an abstract of approximately 300 words describing its content;
   (b) the thesis shall be typed and bound in a manner prescribed by the University;
   (c) four copies of the thesis shall be submitted together with:
      (i) if the candidate so desires, any documents or work published by the candidate whether bearing on the subject of the thesis or not; and
      (ii) a report from the supervisor advising that the candidate has completed the prescribed program and certifying that the thesis is of sufficient academic merit to warrant examination provided that if the supervisor is unwilling to give such a certificate the candidate may nevertheless request that the thesis be accepted for examination.

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

11. On the recommendation of the Doctoral Degree Committee the Senate shall appoint three examiners of whom at least two shall not be members of the staff of the University.

12. The candidate may be required by the Doctoral Degree Committee to undertake further oral, written or practical examinations concerning the subject of the thesis or work.

13. A candidate permitted by the Doctoral Degree Committee to resubmit a thesis for examination shall do so within a period of one year from the date on which the candidate is advised of the result of the first examination.

14. In exceptional circumstances arising in a particular case the Senate on the recommendation of the Doctoral Degree Committee may relax any requirement of this Schedule.
GRADUATE COURSEWORK PROGRAMS

About This Section

This section contains the course programs which have been approved by the Faculty Board in accordance with the Rules governing Graduate Diplomas and coursework Masters programs offered in the Faculty of Engineering.

Enquiries may be directed to the Course Coordinator indicated in the course entry concerned.

Graduate Diploma in Computer Science

Designated Department: Department of Computer Science
Course Coordinator: Dr M. Miller

The Graduate Diploma in Computer Science (GradDipCompSc) is intended as a part-time course for graduates of a variety of disciplines, however, candidates with a strong background in at least one programming language (Pascal or C are preferred) may be able to complete requirements in a single full-time year of study although, in this case, subject choice may be restricted.

Subject prerequisites are prescribed mainly in relation to the BCompSc program. The prescribed prerequisites may therefore be waived for GradDipCompSc students with an appropriate background. Enquiries regarding waiver of prerequisites should be directed to the Course Coordinator.

The GradDipCompSc course program approved by the Faculty Board is presented below.

Course Program

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP201</td>
<td>5</td>
</tr>
<tr>
<td>COMP205</td>
<td>5</td>
</tr>
</tbody>
</table>

Credit Points

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP207 Software Engineering Principles</td>
<td>10</td>
</tr>
<tr>
<td>Subjects from List A* or List B</td>
<td>30</td>
</tr>
<tr>
<td>Subjects from List B</td>
<td>20</td>
</tr>
<tr>
<td>* In exceptional circumstances the Head of the Department of Computer Science may approve enrollment in other subjects.</td>
<td></td>
</tr>
</tbody>
</table>

List A Subjects

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP202 Computer Architecture</td>
<td>5</td>
</tr>
<tr>
<td>COMP203 Assembler Language</td>
<td>5</td>
</tr>
<tr>
<td>COMP204 Programming Language Semantics</td>
<td>5</td>
</tr>
<tr>
<td>COMP206 Theory of Computation</td>
<td>5</td>
</tr>
<tr>
<td>COMP212 Introduction to Programming #</td>
<td>5</td>
</tr>
<tr>
<td>COMP299 Project **</td>
<td>5</td>
</tr>
<tr>
<td>INFO204 Commercial Programming</td>
<td>10</td>
</tr>
<tr>
<td>MATH217 Linear Algebra I</td>
<td>5</td>
</tr>
<tr>
<td>MATH212 Discrete Mathematics</td>
<td>5</td>
</tr>
<tr>
<td>MATH215 Operations Research</td>
<td>5</td>
</tr>
<tr>
<td>MATH216 Numerical Analysis</td>
<td>5</td>
</tr>
<tr>
<td>MNGT303 Computing and Information Systems</td>
<td>10</td>
</tr>
<tr>
<td>MNGT312 Systems Analysis</td>
<td>10</td>
</tr>
<tr>
<td>MNGT313 Systems Design</td>
<td>10</td>
</tr>
<tr>
<td>PHIL242 Basic Symbolic Logic</td>
<td>5</td>
</tr>
<tr>
<td>STAT203 Quizzes and Simulation</td>
<td>5</td>
</tr>
</tbody>
</table>

* Students who completed COMP201 prior to 1991 may not enrol in COMP212.
** Students who completed Software Engineering Principles prior to 1990 but did not complete the Project, must include COMP299 in their program as a List A subject.

List B Subjects

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP901 Computer Design</td>
<td>10</td>
</tr>
<tr>
<td>COMP902 Artificial Intelligence</td>
<td>10</td>
</tr>
<tr>
<td>COMP903 Computer Networks</td>
<td>10</td>
</tr>
<tr>
<td>COMP904 Database Design</td>
<td>10</td>
</tr>
<tr>
<td>COMP905 Design and Analysis of Algorithms</td>
<td>10</td>
</tr>
<tr>
<td>COMP906 Computer Graphics</td>
<td>10</td>
</tr>
<tr>
<td>COMP908 Operating Systems</td>
<td>10</td>
</tr>
<tr>
<td>MNGT511 Management Information Systems</td>
<td>10</td>
</tr>
</tbody>
</table>

GRADUATE COURSEWORK PROGRAMS

SECTION SEVEN

Graduate Diploma in Computing

Designated Department: Department of Computer Science
Course Coordinator: Dr M. Miller

The Graduate Diploma in Computing (GradDipComp) is intended as a part-time course for graduates of a variety of disciplines, however, candidates with a strong background in at least one programming language (Pascal or C are preferred) may be able to complete requirements in a single full-time year of study although, in this case, subject choice may be restricted.

Subject prerequisites are prescribed mainly in relation to the BCompSc program. The prescribed prerequisites may therefore be waived for GradDipComp students with an appropriate background. Enquiries regarding waiver of prerequisites should be directed to the Course Coordinator.

Course Program

The GradDipComp course program approved by the Faculty Board requires completion of 80 credit points selected from the list of approved subjects given below. In exceptional circumstances the Head of the Department of Computer Science may approve enrollment in other subjects.

Approved Diploma in Computing Subjects

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP201 Advanced Data Structures</td>
<td>5</td>
</tr>
<tr>
<td>COMP202 Computer Architecture</td>
<td>5</td>
</tr>
<tr>
<td>COMP203 Assembler Language</td>
<td>5</td>
</tr>
<tr>
<td>COMP204 Programming Language Semantics</td>
<td>5</td>
</tr>
<tr>
<td>COMP205 System Programming</td>
<td>5</td>
</tr>
<tr>
<td>COMP206 Theory of Computation</td>
<td>5</td>
</tr>
<tr>
<td>COMP212 Introduction to Programming #</td>
<td>5</td>
</tr>
<tr>
<td>COMP201 Compiler Design</td>
<td>10</td>
</tr>
<tr>
<td>COMP202 Artificial Intelligence</td>
<td>10</td>
</tr>
<tr>
<td>COMP203 Computer Networks</td>
<td>10</td>
</tr>
<tr>
<td>COMP204 Database Design</td>
<td>10</td>
</tr>
<tr>
<td>COMP205 Design and Analysis of Algorithms</td>
<td>10</td>
</tr>
<tr>
<td>COMP206 Computer Graphics</td>
<td>10</td>
</tr>
<tr>
<td>COMP207 Software Engineering Principles</td>
<td>10</td>
</tr>
<tr>
<td>INF0204 Commercial Programming</td>
<td>10</td>
</tr>
<tr>
<td>MATH217 Linear Algebra I</td>
<td>5</td>
</tr>
<tr>
<td>MATH2121 Diacrite Mathematics</td>
<td>5</td>
</tr>
<tr>
<td>MATH2152 Discrete Mathematics</td>
<td>5</td>
</tr>
<tr>
<td>MATH2162 Numerical Analysis</td>
<td>5</td>
</tr>
<tr>
<td>MNGT213 Computing and Information Systems</td>
<td>10</td>
</tr>
<tr>
<td>MNGT212 Management Information Systems</td>
<td>10</td>
</tr>
<tr>
<td>MNGT212 Systems Analysis</td>
<td>10</td>
</tr>
<tr>
<td>MNGT213 Systems Design</td>
<td>10</td>
</tr>
<tr>
<td>STAT203 Quizzes and Simulation</td>
<td>5</td>
</tr>
<tr>
<td>PHIL242 Symbolic Logic</td>
<td>5</td>
</tr>
</tbody>
</table>

* Students who completed COMP201 prior to 1991 may not enrol in COMP212.

Transition Arrangements

The Course Program was amended with effect from the commencement of the 1992 academic year. All students enrolled in the Faculty Office at the commencement of the 1992 academic year. All students enrolled
in this course were then required to meet the requirements of the
new Course Program except as provided below.

1. Students who have completed COMP102 Introduction to
Programming as an extraneous subject and who have not
completed all List A subjects, will, if they request it, be
granted credit for COMP212 Introduction to Programming
towards satisfaction of Diploma requirements.

2. Students who have completed COMP201 Advanced Data
Structures prior to 1991 may not enrol in COMP212
Introduction to Programming.

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

Students enrolling in Graduate Diploma courses are referred to
the Award Rules in Section 3 of this handbook.

Graduate Diploma in Surveying
Designated Department: Department of Civil Engineering and
Surveying
Course Coordinator: Professor J.G. Fryer
The Graduate Diploma in Surveying (GradDipSurv) is designed to
broaden and further the education of the practising surveyor,
particularly in the light of recent technological changes which
have significantly altered the role and operational techniques of
professional surveyors.

While a full workload for a single year of a course is normally
considered to be 80 credit points, it might not be possible to
complete the requirements of the GradDipSurv course program
in a single year of attendance because of subject prerequisite
requirements. Subject prerequisites are, however, prescribed
mainly in relation to the BSurv program. The prescribed
prerequisites may therefore be waived for GradDipSurv students
with an appropriate background. Enquiries regarding waiver of
prerequisites should be directed to the Course Coordinator.

Course Program
The GradDipSurv course program approved by the Faculty
Board requires completion of 80 credit points selected from the
list of approved subjects given below and approved by the Course
Coordinator. In exceptional circumstances the Head of the
Department of Civil Engineering and Surveying may approve
enrolment in other subjects.

Approved Diploma in Surveying Subjects

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON110 Microeconomics I</td>
<td>10</td>
</tr>
<tr>
<td>ECON111 Microeconomics I</td>
<td>10</td>
</tr>
<tr>
<td>ECON371 Principles of Economics</td>
<td>10</td>
</tr>
<tr>
<td>CIEO301 Introduction to Physical Geography</td>
<td>10</td>
</tr>
<tr>
<td>CIEO310 Introduction to Human Geography</td>
<td>10</td>
</tr>
<tr>
<td>LAW 201 Legal Process</td>
<td>5</td>
</tr>
<tr>
<td>LAW 202 Property and Survey Law</td>
<td>5</td>
</tr>
<tr>
<td>SURV316 Hydrographic Surveying</td>
<td>5</td>
</tr>
<tr>
<td>SURV334 Error Theory</td>
<td>5</td>
</tr>
<tr>
<td>SURV361 Photogrammetry I</td>
<td>10</td>
</tr>
<tr>
<td>CIVL352 Management</td>
<td>5</td>
</tr>
<tr>
<td>SURV351 Geodesy 1</td>
<td>10</td>
</tr>
<tr>
<td>SURV362 Remote Sensing</td>
<td>5</td>
</tr>
<tr>
<td>SURV393 Land Boundary Definition *</td>
<td>10</td>
</tr>
<tr>
<td>SURV417 Industrial and Other Surveying</td>
<td>10</td>
</tr>
<tr>
<td>SURV418 Control Networks</td>
<td>5</td>
</tr>
<tr>
<td>SURV441 Astronomy</td>
<td>10</td>
</tr>
<tr>
<td>SURV452 Geodesy 2</td>
<td>5</td>
</tr>
<tr>
<td>SURV462 Photogrammetry 2</td>
<td>5</td>
</tr>
<tr>
<td>SURV463 Advanced Cartography</td>
<td>5</td>
</tr>
<tr>
<td>SURV472 Land Valuation</td>
<td>10</td>
</tr>
<tr>
<td>SURV473 Town Planning</td>
<td>10</td>
</tr>
<tr>
<td>SURV481 Project **</td>
<td>15</td>
</tr>
<tr>
<td>SURV482 Minor Project A **</td>
<td>20</td>
</tr>
<tr>
<td>SURV483 Minor Project B **</td>
<td>20</td>
</tr>
<tr>
<td>SURV484 Major Project **</td>
<td>40</td>
</tr>
</tbody>
</table>

* A ten day live-in Survey Camp is included as part of SURV393.
** No more than 40p of project subjects may be counted towards Diploma requirements.

Students enrolling in Graduate Diploma courses are referred to
the Award Rules in Section 3 of this handbook.

SECTION SEVEN

GRADUATE COURSEWORK PROGRAMS

Master of Computing
Designated Department: Department of Computer Science
Course Coordinator: Dr B. Beresford-Smith
The Master of Computing (MComp) program is a postgraduate
coursework degree program which incorporates advanced project
work. The course program requires completion of a total of 160
credit points, the equivalent of 2 years full-time study. The
compulsory project work may be taken as COMP503 in a single
year or as both COMP501 and COMP502 over 2 years.

Subject prerequisites are prescribed mainly in relation to the
BCompSc and BCompSc(Hons) programs. The prescribed
prerequisites may therefore be waived for MComp students
with an appropriate background. Enquiries regarding waiver of
prerequisites should be directed to the Course Coordinator.

The subjects approved by the Faculty Board for inclusion in the
MComp program are listed below. In exceptional circumstances
the Head of the Department of Computer Science may approve
enrolment in other subjects.

Approved Master of Computing Subjects

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP301 Compiler Design</td>
<td>10</td>
</tr>
<tr>
<td>COMP302 Artificial Intelligence</td>
<td>10</td>
</tr>
<tr>
<td>COMP303 Computer Networks</td>
<td>10</td>
</tr>
<tr>
<td>COMP304 Database Design</td>
<td>10</td>
</tr>
<tr>
<td>COMP305 Design and Analysis of Algorithms</td>
<td>10</td>
</tr>
<tr>
<td>COMP306 Computer Graphics</td>
<td>10</td>
</tr>
<tr>
<td>COMP307 Software Engineering Principles</td>
<td>10</td>
</tr>
<tr>
<td>COMP308 Operating Systems</td>
<td>10</td>
</tr>
<tr>
<td>COMP401 Advanced Artificial Intelligence</td>
<td>10</td>
</tr>
<tr>
<td>COMP402 Formal Semantics of Programming Languages</td>
<td>10</td>
</tr>
<tr>
<td>COMP403 Advanced Computer Architecture</td>
<td>10</td>
</tr>
<tr>
<td>COMP404 Parallel Computation and VLSI</td>
<td>10</td>
</tr>
<tr>
<td>COMP405 Digital Image Processing</td>
<td>10</td>
</tr>
<tr>
<td>COMP406 Advanced Operating Systems</td>
<td>10</td>
</tr>
<tr>
<td>COMP408 Natural Language Processing</td>
<td>10</td>
</tr>
<tr>
<td>COMP409 Advanced Compiler Design</td>
<td>10</td>
</tr>
<tr>
<td>COMP410 Advanced Computer Networks</td>
<td>10</td>
</tr>
<tr>
<td>COMP411 Special Topic A</td>
<td>10</td>
</tr>
<tr>
<td>COMP412 Special Topic B</td>
<td>10</td>
</tr>
<tr>
<td>COMP413 Special Topic C</td>
<td>10</td>
</tr>
<tr>
<td>COMP414 Special Topic D</td>
<td>10</td>
</tr>
<tr>
<td>COMP415 Graph Algorithms</td>
<td>10</td>
</tr>
<tr>
<td>COMP416 Distributed Operating Systems</td>
<td>10</td>
</tr>
<tr>
<td>COMP417 Database Security</td>
<td>10</td>
</tr>
<tr>
<td>COMP418 Geometric Algorithms</td>
<td>10</td>
</tr>
<tr>
<td>COMP435 Special Topic E</td>
<td>10</td>
</tr>
<tr>
<td>COMP501 Master of Computing Project Part A *</td>
<td>30</td>
</tr>
<tr>
<td>COMP502 Master of Computing Project Part B *</td>
<td>30</td>
</tr>
<tr>
<td>COMP503 Master of Computing Project *</td>
<td>60</td>
</tr>
</tbody>
</table>

* Either COMP503 or both COMP501 and COMP502 must be completed.
### 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 — Continuing Students
  - 9 Monday Public Holiday — Australia Day
  - 6 February First Semester begins
  - 8 February Second Semester concludes — last date for withdrawal from Semester 2

- **February**
  - 5 Friday New students accept UAC main round offer
  - 19 Monday Mid Year Examinations begin
  - 23 Monday Mid Year Examinations conclude
  - 26 Friday Mid Year Examinations end

- **March**
  - 30 Tuesday Last day for withdrawal from UAC main round offer
  - 1 Monday First Semester begins
  - 5 Saturday First Semester begins

- **April**
  - 9 Friday Good Friday — Easter Recrecess commences
  - 23 Monday Lectures resume

- **May**
  - 1 Monday — Lectures Resume
  - 6 Monday — Lectures Resume

- **June**
  - 2 Monday Public Holiday — Queen's Birthday
  - 9 Monday Second Semester begins — last date for withdrawal from Semester 2
  - 13 Friday — Lectures resume

- **July**
  - 4 Monday — Lectures Resume
  - 8 Monday — Lectures Resume

- **August**
  - 1 Monday — Lectures Resume
  - 15 Monday — Lectures Resume

- **September**
  - 30 Thursday — Closing date for UAC applications for enrolment in 1994 (Undergraduate courses other than Medicine and Aviation)

### Course Program A

For students commencing in odd numbered calendar years.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
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<tbody>
<tr>
<td>MECH584</td>
<td>5</td>
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<tr>
<td>ELECS41</td>
<td>5</td>
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<tr>
<td>ELECS41</td>
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<td>MECH591</td>
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<td>ELECS41</td>
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<tr>
<td>MECH591</td>
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</tbody>
</table>

**Elective Subjects**

The following Elective subjects will be offered from time to time in the intensive teaching format. The choice of the Elective subjects to be offered in a semester will be based on the needs of the majority of students. At least 2 Elective subjects will be offered in each semester of intensive teaching. In exceptional circumstances the Course Coordinator may approve the enrolment of candidates in subjects offered in the normal semester format of the University to count in satisfaction of Elective requirements.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE6542</td>
<td>20</td>
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<tr>
<td>CHE6552</td>
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<td>MECH517</td>
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<td>MECH518</td>
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<tr>
<td>MECH516</td>
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</tbody>
</table>

* Selection of the project area occurs in the first teaching session.

### Course Program B

For students commencing in even numbered calendar years.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELECS41</td>
<td>5</td>
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<tr>
<td>MECH591</td>
<td>5</td>
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<tr>
<td>ELECS41</td>
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</tr>
</tbody>
</table>

**Elective Subjects**

The Industrial Systems Project/Seminar is taken over two years of part-time study by enrolment in two separate but related subjects offered in the Departments of Chemical Engineering, Electrical and Computer Engineering and Mechanical Engineering. The project will generally be industry related and, in such cases, the project may be jointly supervised by academic staff of the Department concerned and an industry representative. The seminar, consultation and review components of these subjects will be held during each intensive teaching session. Candidates completing a Power Engineering Project/Seminar subject will present their findings at a Project Presentation to be held after the fourth intensive teaching week.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
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</thead>
<tbody>
<tr>
<td>CHE6542</td>
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<td>MECH517</td>
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<td>MECH518</td>
<td>20</td>
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<tr>
<td>MECH516</td>
<td>20</td>
</tr>
</tbody>
</table>

* Selection of the project area occurs in the first teaching session.
### Year Two

#### Semester One
- **Monday 1 March 1993**
  - Commencement

- **Saturday 9 April 1993**
  - Recession 

- **Monday 19 April 1993**
  - Resumes

- **Friday 3 July 1993**
  - Concludes

#### Semester Two
- **Monday 19 July 1993**
  - Commencement

- **Monday 27 September 1993**
  - Recession

- **Friday 8 October 1993**
  - Resumes 

- **Monday 11 October 1993**
  - Exam Commence 

- **Friday 5 November 1993**
  - Examinations Commence

- **Friday 19 November 1993**
  - Conclude 

- **Monday 22 November 1993**
  - Mini-Examinations

- **Friday 3 December 1993**
  - Concludes

#### Note:
- Semester One consists of Block Four (10 weeks) and 7 weeks of Block Five.
- Semester Two consists of the remaining 3 weeks of Block Five, all of Block Six (10 weeks) and Stavac (1 week)

#### Year Three

#### Block 7
- **February 6**
  - March 30
  - 12 weeks: 1 week block

- **May 17 - June 22**
  - 8 weeks

- **July 8 - August 26**
  - 8 weeks

- **September 13 - October 10**
  - 8 weeks

- **November 15 - December 12**
  - 8 weeks

#### Block 8
- **March 3**
  - April 26
  - 9 weeks

- **May 21 - June 27**
  - 8 weeks

- **July 24 - August 27**
  - 8 weeks

- **September 23 - October 20**
  - 8 weeks

- **November 23 - December 20**
  - 8 weeks

#### Block 9
- **July 12 - September 9**
  - 8 weeks: 8 week block

- **September 13 - November 9**
  - 8 weeks

- **November 10 - January 15**
  - 8 weeks

### Assessment
- **May 10 - May 14, 1994**
  - Vacation

#### Clinical Attachments
- **May 24 - July 9, 1993**
  - Clinical Attachment 3

- **July 12 - August 27, 1993**
  - Stavac

- **September 6 - September 17, 1993**
  - Assessment

- **September 20 - September 24, 1993**
  - 2nd Assesment

- **September 27 - November 9, 1993**
  - Elective Attachment

- **November 22 - November 26, 1993**
  - Final Assessment

#### Note:
- Years 3, 4 & 5 do not conform with the University of Newcastle's Semester dates.

### Advice and Information
- The main point of contact for enquiries concerning courses and enrollment is the Faculty Office. The Faculty Office can provide advice on Faculty rules and policies, course requirements, procedures related to administration and so on. If academic advice is required, the Faculty Office can direct enquirers to the appropriate Dean, Assistant Dean, Course Co-ordinator or Head of Department.

### Faculty Office
- **Contact**
- **Location**
- **Telephone**

### Course Offerings
- **Art, Design & Communication**
  - **Faculty:**
  - **Contact:**
  - **Location:**
  - **Telephone:**

### Student Services
- **Student Services**
  - **Available for all students to assist with many practical matters which may affect personal adjustment to University and success in studies.**

### Special Equipment
- Available in some lecture theatres and in the Library.

### Enrolment of New Undergraduate Students
- Persons offered enrolment are required to attend in person at the Great Hall in February to enrol. Detailed information is given in the University Guide which is sent out with the UAC offer.

### Transfer of Course
- Students currently enrolled in an undergraduate course who wish to transfer to another course may seek permission from the University Admissions Committee (UAC) by 30 September 1992. Late applications will be accepted through UAC until 31 October 1993. Each application will be considered after 31 October direct to the University, but such applications will only be considered if places remain after applications that have been submitted through UAC are considered.

### Re-Enrolment by Continuing Students
- There are five steps involved for re-enrolment by continuing students:
  1. **receive an approved re-enrolment kit in the mail**
  2. **submit the re-enrolment form by 31 October 1993**
  3. **receive a fees & charges notice in the mail in late January**
  4. **receive an approved program and student card.**

### Re-Enrolment KIts
- **For 1994**
  - ** Eligible students:** those enrolled in a degree or diploma course in 1993 who need to re-enrol.
  - **Receive an approved program and student card.**
SCHOLARSHIP HOLDERS

Students will be mailed their Confirmation of Program and Student Card thereafter. The Enrolment Application form must be returned by 31 March 1993.

HECS

Any student who is indebted to the University must also have paid the General Service Charge and fulfilled all charges by 26 February 1993. Students who withdrew from their course after 31 March 1992 are not required to apply for refund of any fee or charge.

RE-ADMISSION

TO PAY OVERDUE

Students who change their name should advise the Student Division Office. Members of the academic staff of the University, senior administrative officers, and other persons authorised for the purpose have authority to report on disorderly or improper conduct occurring in the University.

NOTICE

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

The Hunter Building Concours is used for the specific purpose of displaying examination time-tables and other notices about examinations and final results.

EXAMINATIONS

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

EXAMINATION PERIODS

Formal written examinations take place on prescribed dates within the following periods: Saturday evenings are included:

Mid Year: 14 June - 2 July 1993

End of Year: 8 to 26 November, 1993

Timetables showing the date and time at which individual examinations will be held will be displayed in the Hunter Building Concours, specific Departmental notice boards and other prominent locations on campus. Misreading of the timetable will not under any circumstances be accepted as an excuse for failure to attend an examination.

SITTING FOR EXAMINATIONS

Final examinations, where prescribed, are compulsory. Students should consult the final examination table in advance to find out the dates and times of their examinations.

LOCATION OF EXAMINATIONS

Seat allocation lists for examinations will be displayed about two weeks before the commencement of the examination period, in the noticeboards of the Department running the subject and on a noticeboard outside the examination room on the day of the examination. Candidates should allow themselves plenty of time to get to the examination room so that they can take advantage of the 10 minutes reading time that is allowed before the examination commences. Normal entry into examination rooms will be permitted from 15 minutes before the actual commencement of the examination writing time. This is to allow the candidate time to locate the assigned seat and complete the necessary attendance slip and any related necessary registration details before the commencement of reading time. During reading time no writing will be permitted. Material which may be taken into examination will also be displayed outside unless otherwise specified. In the Great Hall Foyle and Hunter Building Foyle.

PERMITTED AIDS

Students can take into any examination any writing instrument, drawing instruments, scientific calculators, foolscaps, foolscap tablets expected to be taken in; they will be available from the supervisor if need be. Calculators may not be taken into an examination room unless the Examiner has instructed on the
EXAMINATIONS

examination paper that the calculator specified in a permitted aid. Calculators must be hard-wired, battery operated and non-programmable and students should note that no concession will be made.

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

UNLFITM CANCER

If you expect to sit for an examination and your name does not appear on the displayed seat allocation list, it could mean you are not formally recorded 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 enrolment problem is confirmed you may also need to discuss the matter with your Faculty Office.

RULES FOR 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 examinations listed for 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) "award" means the degree, diploma (including graduate diploma and certificate of 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 designated by the Department;

(c) "Departmental Examinations Committee" means the Departmental Examinations Committee of the Department constituted in accordance with the Rules governing Departments;

(d) "examination" includes any form of examination, assessment, test or 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 to assist in the examination of an 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 to assist in the examination process within a Department;

(g) "Faculty Board" means the Faculty Board of the Faculty responsible for the course in which the 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 for an award for which a result may be recorded;

(j) "supervisor" means the supervisor for an examination appointed, in the case of a formal written examination, by the Academic Registrar, in the case of any other examination, by the Head of Department;

(k) "supplementary examination" means an examination administered to a candidate in respect of which 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 comprised of Departments, the functions and responsibilities of the Head of a Department and the Departmental Examinations Committee shall be undertaken respectively by the person or body in that Faculty approved for this purpose by the Rules by the Academic Senate.

(ii) Where a subject is not the responsibility of a single Department, the person or body to undertake the functions and responsibilities of the Head of a 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 award 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 in each subject by the end of the second week of the semester in which the subject commences including the weight and timing of each component of the assessment to be applied in determining the final grade.

Parties

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 may, on the recommendation of a Faculty Board, appoint one or more external examiners for the Department. Such appointments shall be for a term of one year and, except with the approval of the Academic Senate, no external examiner for the Department shall be reappointed for more than one term of office.

(ii) The appointment of an external examiner for a candidate is prescribed by the Rules for an award, or where the Faculty Board considers it appropriate that an external examiner for a candidate by appointed, such appointment shall be made by the Faculty Board.

(b) The examination committee 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 either:

(i) confirm the result;

(ii) defer the decision pending the outcome of such other action as 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.

Review of result in subject

12. (1) A candidate may apply for a review of any result awarded in a subject to that candidate.

(ii) An application made under sub-rule (1) shall be made to the Faculty Board on the prescribed form and shall be accompanied by a prescription made by the candidate not later than three days after the date of the examination.

A candidate who is granted special consideration may be required to attend a further examination or to undertake further assessment to determine a result.

PART 4 - FORMAL WRITTEN EXAMINATIONS

Responsibility

14. The Academic Registrar shall be responsible for the administration and supervision of the formal written examinations of the University.

Timetable

15. (1) The Academic Registrar shall publish a timetable showing when and where formal written examinations will be held and it shall be the responsibility of candidates to attend those examinations prescribed for the subjects in which they are enrolled.

(ii) Notwithstanding the provisions of Rule 15(1), where the Academic Registrar is satisfied, on the basis of advice from any body or person, that special arrangements are necessary to ensure fair and equitable treatment of candidates, the Academic Registrar may make regulations to the contrary.

Subject to the provision of Rule 15(1)(a), candidates who fail to attend an examination which is shown on the examination timetable shall 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 rules:

(a) candidates shall comply with any instructions given by the supervisor relating to the conduct of the examination;

(b) before the examination begins candidates shall not read the examination paper until granted permission by the supervisor which shall be given ten minutes before the start of the examination;

(c) no candidate shall enter the examination room after thirty minutes after the time the examination has begun;

(d) no candidate shall leave the examination room during the first thirty minutes or the last ten minutes of the examination.
SPECIAL CONSIDERATION REQUESTS

(e) no candidate shall re-enter the examination room after leaving it unless during the full period of absence that candidate has been under approved supervision;

(f) a candidate shall not bring into the examination room any bag, paper, book, written material, device or aid whatsoever, other than such as may be specified for the particular examination;

(g) a candidate shall not by any means obtain or endeavour to obtain improper assistance, give or endeavour to give assistance to any other candidate, or commit any breach of good order;

(h) a candidate shall not take from the examination room any examination paper, answer book, examination paper so marked, graph paper, drawing paper or other material issued for use during the examination;

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

(2) The provision of sub-rule (1) may be relaxed:

(a) by the Academic Registrar; and

(b) with the exception of paragraphs (e), (f), (g) and (h) 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 assistance has been exercised shall be reported in writing to the Academic Registrar immediately following the conclusion of the examination.

PART 5 - OTHER EXAMINATIONS
Responsibility

17. 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 Department or the supervisor relating to an examination.

Timetable

18. (1) Where appropriate, the Head of Department shall publish a timetable showing when and where examinations will be held and it shall be the responsibility of candidates to attend those examinations prescribed for the subjects in which they are enrolled.

(2) Notwithstanding the provisions of Rule 18(1), where the Head of Department considers it justified for 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.

Compliance with Instructions

19. Candidates shall comply with any instructions given by the Head of Department or the supervisor relating to an examination.

Any infringement of these rules constitutes an offence against discipline.

FINAL EXAMINATION RESULTS

End of year examination results will be mailed out by late December. Examination results for Semester 1 subjects will be mailed out the week preceding the commencement of Semester 2.

Final examination results are also displayed in the Hunter Building Concourse as soon as they become available.

No results will be given by telephone.

REVIEW OF FINAL RESULT

After the release of both Semester 1 and end of year final examination results a student may apply to have a result reviewed. Part 3 of the University's Examination Rules specifies procedures relating to Review of Result in a subject, for details see page (vii) and the necessary application form. You should read the instructions on the application form before applying for a Review. There is a charge per subject, which is refundable in the event of an error being discovered. However, it should be noted that examination results are released only after careful assessment of students' performances and that, amongst other things, marginal failures are reviewed before results are released. (see page (ix)

SPECIAL CONSIDERATION REQUESTS

All applications for special consideration should be made on the Application for Special Consideration form.

The granting of Special Consideration could involve a further examination or assessment held shortly after the formal examination. Any further examination or assessment administered will be by the Department that offered the subject to ascertain that Department's requirements. You should also watch the Department's noticeboard for further advice concerning Special Consideration.

Application Forms may be obtained from your Faculty Office, Student Division Enquiry Counter, Student Health Services, Student Counselling Unit and Examinations & Services Counter, Hunter Building.

Part 3 of the University's Examination Rules specifies procedures relating to Special Consideration Requests, for details see page (vi) and the necessary application form. You should read the instructions on the application form before applying for Special Consideration.

STATEMENTS OF ACADEMIC RECORD

If you wish to be issued with a statement of your academic record, you must complete the appropriate application form and lodge it with the University Cashier along with the appropriate fee (see page (x)). The statement will be rolled out as soon as it becomes available, to the nominated address. Applicants should allow adequate time for this to occur. Computer produced statements can normally be mailed within a week. Statements involving previous enrolments might be expected to take longer to produce. Ineligible applicants must clear their debt before statements can be issued. Application forms may be obtained from the Student Division Enquiry Counter, Chancellery Building and the Examinations and Services Counter, Hunter Building.

UNSATISFACTORY PROGRESS

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

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

Appeals against exclusion must be lodged with the Committee.

(1) The Committee shall make the decision which the Committee is empowered to make pursuant to these Rules.

(2) The Board of the Faculty of the subject in which the student is enrolled is empowered to make a decision which the Committee is empowered to make pursuant to these Rules.

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

(a) make any decision which the Board itself could have made pursuant to Rule 4(1)(a), (b) or (c) of these Rules;

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

(c) exclude the student from the University.

Review of Performance by Board

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

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

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

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

(i) in the course;

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

(iii) in the Faculty;

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

(2) Before a decision is made under Rule 4(1)(b) or (c) of these Rules the student has been given prior written notice of the intention to consider the matter, with brief particulars of the grounds for so doing, and has also been given a reasonable opportunity to make representations either in person or in writing or both.

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

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

Re-enrolment

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

(2) A student who has been excluded from further enrolment in any course, Faculty of University under these Rules may for the purpose of enrolment therein again, provided that in no case shall such re-enrolment commence before the expiration of the period of exclusion. A decision on such applications shall be made by:

(a) the Board, where the student has been excluded from a single course or a single Faculty;

(b) the Committee, in any other case.

APPEAL AGAINST RE-ENROLMENT APPLICATION

10. (1) A student whose application to enrol pursuant to Rule 9(1) or 9(2)(b) of these Rules is rejected by a Board may appeal to the Committee.

(2) A student whose application to enrol pursuant to Rule 9(2)(b) of these Rules is rejected by the Committee may appeal to the Vice-Chancellor.
SCHOLARSHIP HOLDERS

CHARGES

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

In 1993, a fee and charges notice will be sent to continuing students in late January and to commencing students in mid-February. Students are expected to pay charges at any Commonswealth Bank. The last date for payment of charges with the Commonwealth Bank is 19 March 1993. All other payments should be made directly to the University by cheque, or in person to the Cashier, level 2, Chancellery.

1. General Services Charge Per Annum

(a) Students Proceeding to a Degree or Diploma $264
   Plus Students joining Newcastle University
   Union for the first time $35
   (b) Non-Degree Students Newcastle University Union Charge $137
   (c) External Students $37

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 under special supervision $15
   per paper
   (b) Review of examination results, per subject $25
   (c) Replacement of Re-enrolment Kit $15
   (d) Replacement of Student Card $5
   (e) Statement of Matriculation Status for non-member of the University $10
   (f) Replacement of lost or damaged Tertiary ID $30
   (g) Academic Transcripts
      (i) First copy $10
      (ii) Second Copy No charge
      (iii) Each additional copy $1

Note:
   (i) Graduands will be provided with two copies of their transcript free upon notification of eligibility to graduate.
   (ii) Transcripts will be issued on request free of charge to other tertiary education institutions.

4. Indebted Students

All debts outstanding to the University must be paid before enrolment can be completed—part payments 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 8 credit point full-time load in 1993 is $2328.00. Student loads are calculated as at the census date each semester i.e. 31 March in Semester One and 31 August in Semester Two. Withdrawals affect effective on or 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-paid approved postgraduate award course”
- a student in a “basic nurse education course”
- a “full-time paying overseas student”
- a “student who has paid the Overseas Student Charge”
- a “fully sponsored overseas student”
- an “in an enabling course”
- a “student in an “non-award” course
- a student who has been awarded a “HECS postgraduate scholarship”

Basic Nursing education courses will not be exempt from HECS after 1993. All full-time students remaining in their studies by the end of the 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 three 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) Defer their HECS and elect to pay through the taxation system, in which case they must either provide a tax file number or apply for a tax file number as part of their enrolment. Institutions are required to ensure that the information given by students of their tax file number application is the same as that on their enrolment form.

Students electing to defer their HECS and pay through the taxation system are required to remit monies towards their contribution until their taxable income reaches a minimum threshold level. For the 1991-92 financial year the minimum threshold was $27,098. This amount will be increased each year.

(c) As from 1993 New Zealand citizens residing in Australia for less than two years and permanent residents of Australia whose term of address is overseas will be required to pay their HECS contribution up-front. The 25% discount applies.

New Zealand citizens living outside Australia and enrolled in external courses at Australian institutions should be treated in the same way as permanent residents of Australia whose semester address is overseas and be required to pay up-front.

The requirement to pay up-front will apply to both commencing and continuing students.

(d) Provide evidence of exemption from the HECS.

A check containing details of a new course must complete a Payment Options form selecting one of the above options. Deferred or Up-front re-enrolling students will retain their elected payment option only if they are still enrolled when the falling in category (c) above. A new Payment Options form must be completed if students transfer courses or wish to change their payment options. Students who wish to change their Payment Option in any semester must do so before the census date for that semester. Changes to the Up-front option will not be permitted after the due date for payment of Up-front accounts (c) above). Students who fail to make an up-front payment for any reason must meet the University’s financial obligations.

Failure to pay up-front by the due date or change to the deferred option before the census date will lead to automatic cancellation of the student’s enrolment in all courses.

LATE PAYMENTS WILL NOT BE PERMITTED.

Please contact the HECS Office if further information on HECS is required.

LOANS

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

An application for a loan from the student loan funds is possible when no other help is available. Approvals for loan from these funds must be made before the 26 February 1993 to avoid the addition of a late fee. Student loan funds are available for other essential needs. Contact the Student Support Office, Ms Annette Burt, phone (02) 214647 to arrange an appointment.

REFUND OF CHARGES

A refund of the General Services Charge paid on enrolment will be made when the student withdraws from the Student Division of a complete withdrawal of study from the following conditions:

(i) when a student notifies the University of a complete withdrawal of study from the following dates, a refund will apply:
   - Notification on or before 31 March 100% refund
   - Notification by the end of first semester 50% refund
   - Notification after the end of first semester Nil refund

(ii) when a student solely enrolled in a program of studies offered only in Semester 2 notifies the University of a complete withdrawal of study from the following dates, a refund will apply:
   - Notification on or before 31 August 100% refund
   - Notification after 31 August Nil refund

Students provided that in exceptional circumstances the University may vary these provisions in the case of individual students.

The $35 joining fee is not refundable.

A refund will not be made before 31 March.

CAMPUS TRAFFIC AND PARKING

Matters to do with traffic and parking on the campus are governed by traffic and parking rules approved under the authority of the University Council.

These rules determine that it is a privilege to bring a vehicle onto the University campus and that this privilege is subject to traffic and parking rules. The rules identify the conditions which govern the bringing of vehicles onto the campus, parking and movement of vehicles, and matters to do with brakes and enforcement. The underlying rationale of these rules is to ensure the safe and orderly movement of vehicles across the campus, to protect the University’s physical environment and landscape.

Essentially the rules require that people who seek to bring a motor vehicle, including motorcycles, onto the campus apply for a vehicle parking permit. In so doing, the applicant undertakes to abide by the traffic and parking rules and are automatically subject to prescribed penalties for infringements. It is important to realise that the granting of a parking permit does not carry with it any automatic right to park on the campus. The University has a serious interest in ensuring that ample car parking spaces and facilities are available. It is important to realise that it is not possible to park on the campus.

The issue of a parking permit only entitles a member of the University to park in a properly designated and marked out car park space to the extent that such a space is available. It is essential that vehicles are not parked on grassed areas, footpaths, roadsides and the like for the protection of the University’s landscape and for the safety of students, staff and visitors.

Parking permits are to be utilized when on campus car parks are full. It is available on both sides of University Drive (subject to compliance with traffic regulations in regard to bus, steps, distance from pedestrian crossings, roadblocks etc).

The University is working with public transport authorities to improve the level of transport to the University so as to alleviate the necessity for staff and students to use their own cars. It is in the interests of all members of the University community, and to the development and maintenance of the campus building layout, to dramatically reduce the number of vehicles being brought on campus, particularly in peak times with the broader issues of air pollution, traffic congestion and the like.

Students are urged to consider alternative modes of transport, such as public transport, and greater use of bicycles to take advantage of the new walkways serving the University. Car parking arrangements are therefore encouraged and your Student Representative Council (SRC) can assist you in this regard.

Neither the University nor the SRC accepts responsibility for loss of any property or damage to vehicles parked on or off the campus.

Parking regulations are stated in full in the University’s Calendar Volume 1. The scale of penalties for traffic and parking infringements as contained in the rules are as follows:

(a) exceeding the speed limit on University roads $10
(b) failing to stop when signalled to do so by an Officer $30
(c) illegal parking $10
   (i) parking on University roads $15
   (ii) in the rules $15
   (iii) parking on areas marked by sign $15
   (iv) in a way that may risk injury to others $50
   (v) not displaying parking permit $30
   (vi) parked in a restricted area $50
   (vii) parking in an area reserved for handicapped person $50
   (viii) any other breach of the traffic and parking rules $10

The penalty will be imposed:

(a) by sending an infringement notice by ordinary prepaid post to the registered owner of the vehicle,

(b) by sending an infringement notice by ordinary prepaid post to the registered owner 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. It will 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 either reject it or waive the penalty.

Penalties must be paid:

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

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

All queries in relation to traffic and parking matters may be referred to the Student Services Centre, located in the foyer of the Great Hall or to the Student Services Office, located in the foyer of the Hunter Building. Applications forms to bring a vehicle onto the campus are also available from these offices.
The traffic and parking rules apply to all University campus locations. It is required, however, that no University parking facilities are available at the Conservatorium of Music campus in Auckland Street, Newcastle.

BANKING

1) Commonwealth Bank

The University of Newcastle branch of the Commonwealth Bank is located on the paddock between the Chancellery and the Hunter Gymnasium (south of the Hunter Union). An automatic teller machine is located outside. Hours of Opening:

- Monday to Friday: 9:30am - 4:00pm
- Friday: 9:30am - 3:00pm

2) Credit Union

The main branch of the University Credit Union is located with the Student Union on the former University side of the campus.

Hours of Opening:

- Monday to Friday: 9:00am - 4:00pm

An agency is located in the Hunter Union Building.

CASHIER

The Cashiers office on-campus is located on First Floor, Chancellery Building. Credit card facilities are not available.

Hours of Opening:

- (a) During Semester: 10:00am - 4:00pm (Open during lunch break)
- (b) Vacation Period: 10:00am - 12:30pm, 2:00pm - 4:00pm

CHAPLAINCY SERVICE

The Chaplaincy Centre is located in the temporary buildings adjacent to the Computer Teaching Building and also in Room A118 in the Hunter Building near the Husky Library.

Pastoral and spiritual care is available from the following denominational chaplains:

Anglican: Catholic
Baptist: Presbyterian
Uniting Church Assembly of God
Russian Orthodox: Seventh Day Adventist

Both centres are open: Monday to Friday 8.30 am - 5:00 pm.

The Central Coast Campus and the Conservatorium of Music are both covered on a regular basis.

COMMUNITY PROGRAMMES

The Department of Community Programmes offers a wide range of courses for the general public. Of particular interest to intending students are the Bridging Courses conducted during February and the Open Foundation Course for mature age entry purposes which commences in March.

Students interested in Bridging or preparatory courses should telephone, write or call at the Department's office in Room LG04, Lower Ground Floor, McCallum Building. The Department is also able to respond to requests to tailor make Courses, Workshops, Seminars and Training Sessions for particular clients in virtually any subject area. Telephone: (049) 216017.

CONVOCATION

All students of the University of Newcastle become members of Convocation upon graduating. Convocation is the graduate body of the University of Newcastle and, under the provisions of the University of Newcastle Act, is one of the constituent parts of the University. By virtue of the Act and the University By-Laws, Convocation has a voice in the government of the University through its right to elect members of Council and the Standing Committee's right to direct communication with the Council and the Senate. Through its membership of the Australian University Graduate Conference, Convocation also operates with its counterparts in other universities to give effective expression of opinion on matters of concern to graduates.

The Convocation Office may be contacted on (049) 216464.

CO-OP BOOKSHOP

The Co-op Bookshop is located within the Shortland Student Union. It stocks textbooks, general publications, computer discs and other software, audio-visual cassettes. Discounts are available to Co-op members.

Hours of Opening:

- Monday, Wednesday and Friday: 9:00am - 5:00pm
- Tuesday and Thursday: 9:00am - 6:00pm
- First two weeks of semester: 8.30am - 7:00pm

LOST PROPERTY

Lost property may be collected from, or deposited at two locations on campus:

1) Patrol Office, Great Hall between 9:00am - 4:00pm
2) Property Services, C110, between 9:00am - 4:00pm (Hunter Building)

It is suggested that you telephone in advance.

NOTICEROADS

Students wishing to post notices within the glass-fronted locked noticeroads should contact Mr D. Heggan, Property Services in the Hunter Building.

POST OFFICE

Offers all normal postal services EXCEPT interviews for passports.

Hours of Opening:

- (a) During Semester: Monday to Friday: 9.00am - 5:00pm
- (b) Vacation Period: Monday to Friday: 9.00am - 1:30pm

PUBLIC TRANSPORT

The State Transit Authority provides a comprehensive bus service to the University from the following locations:


Bus Timetables are available from the Student enquiry counter in the ground floor of the Chancellery Building.

STUDENT INSURANCE COVERAGE

Studentship Insurance is an accident policy which is administered by the Sports Union/SPORT and Recreation Office on behalf of American Insurance Underwriters (A.I.U.). This policy provides benefits for death, disability, hospitalisation, loss of wages and medical expenses (these are restricted to injuries sustained whilst engaged in campus activities). The injury must be a result of a "fortuitous act" (i.e. due to chance). It does not cover disability arising from sickness or disease. There is a $50.00 excess applicable to accident, not each claim. This excess is deducted from the first part-claim only.

Student plan can cover:

- i. Students who are members of the Sports Union (this does not include students who have deferred study). Membership of the Sports Union is included in the General Service Charge.
- ii. Students enrolled in the University members of the following organisations:
  - Social Students of the University
  - University Women's Union
  - University Crane Club
iii. Staff of the Sports Union and staff of the University who join the Sports Union.

For further information and claim forms, please contact the Sports and Recreation office during business hours on (049) 215584.

UNIVERSITY COMPUTING SERVICES

The University of Newcastle has made use of computers in research and teaching and for administrative purposes since the first computer was installed in October 1963.

The computers are widely used in teaching wherever this is appropriate. Some of these are managed by the teaching departments while others are maintained and supported by University Computing Services in publicly available locations.

The central computers and many others are connected to the University Information Network (UIN) which in turn is connected to the Australian Academic and Research Network (AARNet) and to the worldwide Internet.

University Computing Services provides and supports computing services for most activities of the University: for academic departments, through the Health and Computer Laboratories Manager, for administrative divisions and for service units. Services are provided through central computers, through a campus network with external links, and through assistance to users of both the central computers and distributed desk-top computers.

There are more than 800 terminal connections directly to the campus network, allowing connection to various computers, both in University Computing Services and in University departments. A number of School and Departmental computers and networks are also connected to the UIN.

Students are given access to central VAX/VMS and UNIX computers and centrally located microcomputers (Apple Macintosh and IBM PCs or clones) and to departmental and special purpose computers as appropriate to their course of study. Many packages are available such as the NAG numerical library, statistical packages such as MINLISH, SAS, SPSS-X and BMDP and word-processing. All students are free to use the electronic News and Mail services for on-campus use. AANet access is only available to coursework students when specifically requested by course lecturers.

Students enrolling in a subject for which a computer connect-time quota has been established are automatically given accounts on the central computers. Issues of access (whether they be staff, students or other users) without their express permission are restricted to injuries sustained whilst engaged in campus activities.

You may not attempt to interfere with the operation of the University's computers or any other facilities accessed by use of the Universities' computers or network.

You may not attempt to subvert the security of any of the University's computing facilities or any others accessible by use of the Universities' facilities.

You may not use the Universities' computing facilities to send obscene, offensive, bogus, harassing or illegal messages.

You may grant access to your own files by other users by setting appropriate protections.

You may access computing and communications facilities on other sites only with their permission and in a manner consistent with these terms.

You must, on request by an authorized member of staff, produce evidence of identity (for example by student card) when using University computing facilities.

You are required to inform the University of any breach of these Terms (for example, if you become aware that someone else has used your account).

You must abide by any relevant instructions given by the Director or the Director's delegated officer. Such instructions may be issued by notice displayed in the vicinity of computing facilities, by letter, by electronic communication, in person or otherwise.

UNIVERSITY LIBRARIES

As a member of the University of Newcastle, you are entitled to use the Auchmuty Library and the Shortland Library. The Auchmuty Library is the main library on the Callaghan campus. It supports the teaching and research requirements of the Faculties of Architecture, Arts, Economics,
and Commerce, Education, Engineering, Medicine, Science and Mathematics 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 in high demand: students may borrow these for restricted periods.

The Biomedical Reading Room houses books, serials, pamphlets and reference material in Biomedicine and Medicine; i.e. within the classification ranges 016.57-016.619 and 270.619. It also includes a special area, in Medical Reserve, 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, Gosford, Maitland, Orange, Lismore 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 University and Gardner Libraries enjoy complete reciprocity.

The Law Reading Room houses books, serials, and primary law materials including laws 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 215851.

Huxley Library

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

Other services include: Loans, Reference Service, CD-ROMs, Online searching, Inter-Library Services, External Student Services, 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, CDs, and sound recordings. It is located at the Newcastle Conservatorium of Music, on the corner of Gibbon and Auckland Streets, in the city.

Currently only students and staff of the Conservatorium of Music can borrow from this Library. This includes Music Education students enrolled on the Callaghan Campus.

Further information can be obtained by contacting the Librarian on (043) 622077.

Central Coast Campus Library

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

Further information can be obtained by ringing (043) 622077.

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 Loan Desk immediately. Replacement cards are available for $5.00 from the Student Division Office in the Chancellery.

Borrowing Rights

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

Book must be returned to 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 will be 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 Libaries. 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 other indexes are available in the Reference Collection for manual searching. Some are on computerised databases available via telecommunication networks. AARNet, 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. Credit for the photocopiers 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 photocopying machines.

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 within 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 in 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 catalogue. Please phone 215851.

Hours of Opening

AUCHMUTY LIBRARY

Term Hours:

Monday to Thursday: 8.30am to 10.00pm 8.30am to 7.00pm 1.00pm to 5.00pm

Friday: 8.30am to 1.00pm 5.00pm

Saturday & Sunday: 10.00am to 5.00pm

Semester Breaks:

Monday to Friday: 8.30am to 1.00pm 5.00pm

Saturday & Sunday: Closed

HUXLEY LIBRARY

Term Hours:

Monday to Thursday: 8.30am to 9.00pm 8.30am to 5.00pm 1.00pm to 5.00pm

Friday: 8.30am to 1.00pm 5.00pm

Saturday & Sunday: Closed

Semester Breaks:

Monday to Friday: 8.30am to 1.00pm 5.00pm

Saturday & Sunday: Closed

AUSTRALIA DAY, Easter except Easter Monday, Christmas to New Year

Library Open:

Easter Monday, Anzac Day, Queen's Birthday, Show Day, Labour Day

CENTRAL COAST CAMPUS LIBRARY

Please contact the Library on 294 133

See inside for details of the following:

Newcastle and Hunter Libraries

Callaghan

Auchmuty

Huxley

Central Coast Campus Library

See inside for details of the following:

Newcastle and Hunter Libraries

Callaghan

Auchmuty

Huxley

Central Coast Campus Library

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Auchmuty

Huxley

CENTRAL COAST CAMPUS LIBRARY

Please contact the Library on (043) 622077.
SECTION EIGHT

SUBJECT DESCRIPTIONS

About This Section

This section contains descriptions of the content of the subjects offered by the departments of the Faculty of Engineering together with subjects offered by other faculties which are included in the course programs set out in Sections 5 and 7.

Guide to Subject Descriptions

Credit Point Value

The course programs require full-time students completing course requirements in minimum time to undertake an annual workload of 80 credit points. The credit point value of a subject thus indicates the workload of a subject as a proportion of a normal annual full-time program. Similarly, the credit point value of a subject indicates the proportion of the annual HECS liability which arises from enrolment in that subject. Further information on the meaning of credit points is given in the General Course Policies and Information in Section 4.

The credit point value (cp) of each subject is indicated in each subject description.

Subject Codes

Each subject has been given a unique code (eg CIVL111). This code identifies the subject within the University's computer system and should be entered on each form dealing with subjects.

The alpha section of the code indicates the department responsible for offering the subject. The first number in the code indicates the level at which the subject is offered (ie. 100, 200, 300, 400 etc.) and, in the Faculty of Engineering, also indicates the WAM weighting of the subject. The latter two numbers may indicate the sequence of a subject in a stream of subjects or within a course.

The departmental indicators included in this Handbook are listed below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Department</th>
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</thead>
<tbody>
<tr>
<td>BIOL</td>
<td>Biology</td>
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<tr>
<td>CHBE</td>
<td>Chemical Engineering</td>
</tr>
<tr>
<td>CHEM</td>
<td>Chemistry</td>
</tr>
<tr>
<td>CIVL</td>
<td>Civil Engineering and Surveying</td>
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<tr>
<td></td>
<td>(Civil Engineering subject)</td>
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<tr>
<td>COMM</td>
<td>Commerce</td>
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<tr>
<td>COMP</td>
<td>Computer Science</td>
</tr>
<tr>
<td>ECON</td>
<td>Economics</td>
</tr>
<tr>
<td>ELSC</td>
<td>Electrical and Computer Engineering</td>
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<tr>
<td>GEOG</td>
<td>Geography</td>
</tr>
<tr>
<td>GIEL</td>
<td>Geology</td>
</tr>
<tr>
<td>INFO</td>
<td>Management (Information Science subject)</td>
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<tr>
<td>LAW</td>
<td>Law</td>
</tr>
<tr>
<td>MATH</td>
<td>Mathematics</td>
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<tr>
<td>MECN</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>MNGT</td>
<td>Management</td>
</tr>
<tr>
<td>PHIL</td>
<td>Philosophy</td>
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<tr>
<td>PHYS</td>
<td>Physics</td>
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<tr>
<td>PSYC</td>
<td>Psychology</td>
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<tr>
<td>SCEN</td>
<td>Applied Science and Technology</td>
</tr>
<tr>
<td></td>
<td>(Environmental Science subject)</td>
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<tr>
<td>STAT</td>
<td>Statistics</td>
</tr>
<tr>
<td>SURV</td>
<td>Civil Engineering and Surveying</td>
</tr>
<tr>
<td></td>
<td>(Surveying subject)</td>
</tr>
</tbody>
</table>

Prerequisites and Corequisites

Many subjects have prerequisite and/or corequisite requirements. The meaning of these terms are defined in the Award Rules. The prerequisite and corequisite requirements of the subjects described in this Handbook are set out in Section 9.

The head of the department offering a subject may waive the prerequisite or corequisite requirements of a subject offered by that department. Students should obtain any such waiver in...
writing on the form available from the Faculty Office and submit the completed form attached to any request for variation of program.

Assumed Knowledge

Many subjects also have assumed knowledge requirements. These are also set out in Section 9 of this Handbook. Students are strongly advised to have completed the subjects prescribed as assumed knowledge before enrolling or to otherwise discuss the extent of their disadvantage with the head of department or the lecturer concerned.

Examinations and Assessment

Refer to policies 3.1 and 3.5 of the Faculty's Policies on Undergraduate Performance and Progress published in Section 4 of this Handbook.

Students will be advised of the assessment procedures for each subject within the first 2 weeks of classes.

Contact Hours

The credit point value of a subject gives an indication of the workload required of a student as a proportion of the normal full-time annual workload of 80 credit points (see General Course Rules and Information in Section 4). Contact hours vary according to the content and teaching requirements of each subject. In most cases, however, a 5 credit point engineering subject offered in one semester requires 3 contact hours per week. Scheduled contact hours are specified in the University Timetable.

Texts

The information on required texts available at the time of publication is included in each subject description. In most cases, it is recommended that students purchase the texts specified, however, it is suggested that students consult with the lecturer concerned before finalising the purchase of texts.

References

Information on reference material is not published in this Handbook. In the case of subjects offered by departments of the Faculty of Engineering, the details of appropriate reference material will be supplied by the lecturer concerned. In the case of other subjects, reference material may be specified in the handbook of the faculty in which the subject originates.

Availability of Subjects

Not all subjects are necessarily available in each academic year. In particular elective subjects may not proceed if the department concerned considers that there is insufficient demand for the subject or if insufficient resources are available.

Students requesting enrolment in elective subjects should check with the department in the first week of the semester to ensure that the subject that they have chosen will indeed be offered.

Alterations to Subjects

The Faculty Board and the departments of the Faculty reserve the right to amend any aspect of the content of any subject or the arrangements for offering a subject. The details of subjects given in this Handbook and the University Timetable are an expression of intent only and are not to be taken as a firm offer or undertaking.

Biology Subjects

BIOL01 PLANT AND ANIMAL BIOLOGY 10cp


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.

See Faculty of Science and Mathematics Handbook for further information.

Texts


or


BIOL02 CELL BIOLOGY, GENETICS AND EVOLUTION 10cp


Ecology and Evolution: An introduction to ecology, population genetics and evolution.

See Faculty of Science and Mathematics Handbook for further information.

Texts


or


BIOL03 PLANT PHYSIOLOGY 10cp

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.

See Faculty of Science and Mathematics Handbook for further information.

Text


BIOL04 GENETICS 10cp

Introduction to genetics, population genetics, and molecular genetics. The processes examined include whole cell, organelle, and molecular genetics.

See Faculty of Science and Mathematics Handbook for further information.

Text


BIOL05 MOLECULAR GENETICS 10cp


See Faculty of Science and Mathematics Handbook for further information.

Text


BIOL06 PLANT PHYSIOLOGY 10cp

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.

See Faculty of Science and Mathematics Handbook for further information.

Text


 BIOL07 PLANT PHYSIOLOGY 10cp

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.

See Faculty of Science and Mathematics Handbook for further information.

Text


BIOL08 PLANT PHYSIOLOGY 10cp

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.

See Faculty of Science and Mathematics Handbook for further information.

Text


Text
Wall, T.F. and Ahmed, N.A. 1991, Introduction to Chemical Engineering Notes, Department of Chemical Engineering.

CHEE111 CHEMICAL AND MANUFACTURING 10cp PROCESSES
An introduction to the structure and organisation of the chemical and process metallurgical industries in Australia, with reference to the world scene. Descriptions of processes used in the manufacture of the major industrial chemicals, including hydrometallurgical and smelting operations. Outline of typical unit operations. Description of various processes used in the fabrication and utilisation of materials. Visits to a number of industrial plants illustrative of the course material, and preparation of process flow diagrams, to Australian Standards requirements.

Text

CHEE191 INDUSTRIAL EXPERIENCE 5cp

CHEE192 INDUSTRIAL EXPERIENCE 5cp

CHEE193 INDUSTRIAL EXPERIENCE 5cp

CHEE194 INDUSTRIAL EXPERIENCE 5cp

These subjects are designed to formalise periods of Industrial Experience gained by past-time students. Only one subject may be taken in any one year. Students will be required to present a report giving a connected account and critical evaluation of their engineering activities and experience during the year. Industrial Experience subjects may be taken by past-time students in any year after completion of Stage 1 and counted towards satisfaction of the Elective requirements of the course.

CHEE241 DESIGN PRINCIPLES 10cp
Materials: Materials of construction for process equipment in chemical industry. Use, limitations and cost, problems of fabrication. Design: Procedure for basic mechanical design of beams, columns and simple structures. Elementary theoretical basis for design of pressure vessels; design procedures from code requirements. Preliminary costing and drafting of fabricate chemical equipment items. Use of computer aided design packages.

Text

CHEE242 CHEMICAL ENGINEERING COMPUTATIONS 10cp
An introduction into the writing and use of computer programs and packages which use numerical techniques to solve problems in engineering. Emphasis is placed on the use of both mainframe computers and PCs. Topics include numerical solutions of ordinary and partial differential equations. Techniques for the solution of linear and nonlinear algebraic equations, systems of linear and nonlinear equations. Numerical integration and differentiation techniques. Sources of errors and error estimation in numerical techniques.

Text

CHEE263 TRANSFER PRINCIPLES 1 10cp


Text

CHEE264 TRANSFER PRINCIPLES 2 10cp


Text

CHEE281 LABORATORY 1 5cp
Experimental investigations into the fundamentals of mass, momentum and heat transfer. An introduction into technical report writing.

CHEE282 LABORATORY 2 10cp
Experimental investigations into elementary unit operations, flow measurement and measurement of chemical and physical properties. Technical report writing. An introduction into applied statistics.

Text

CHEE342 SAFETY AND ENVIRONMENT 10cp
General introduction to the inherent hazards of the materials and processes relevant to the chemical industry. Elements of hazard analysis and optimization. Aspects of industrial toxicology. Sources, types and effects of explosions. Legal, environmental and health and safety considerations in the disposal of industrial wastes. Waste disposal and pollution control; treatment and disposal of solid, liquid and gaseous effluents; recycle possibilities, statutory requirements and environmental regulations; E.I.S. assessment.

CHEE351 ELECTROCHEMISTRY AND CORROSION 5cp
Physical chemistry: Interfaces, solid surfaces and adsorption, surface chemistry. Surfactants, micelles, emulsion stability, flocculation, froth flotation, wetting.

Electrochemical corrosion: Cathodic and anodic protection, passivation.

Electrochemical processes: Batteries, gold extraction, galvanising, chlor-alkali and non-ferrous metal industries.

CHEE352 TRANSPORT PHENOMENA 5cp
An introduction to momentum energy and mass transport as a continuous approach. Shell balances and unsteady state solutions by algebraic and numerical procedures using computer packages such as Fidap.

Text

CHEE353 SURFACE CHEMISTRY 1 10cp

Text

CHEE354 BIOTECHNOLOGY 5cp
Properties of important micro-organisms; thermodynamic and stoichiometric aspects of microbial metabolism and activity. Product pathways and enzymes. Reactions and flow behaviour of fermentation fluids; transfer processes and unit operations for...
product recovery; with examples from pharmaceutical, agriculture, food, energy and liquid efficient control.

**CHEE356 PROCESS SYNTHESIS** 5cp

**Text**

**CHEE357 FUEL TECHNOLOGY 1** 5cp
The properties of gaseous, liquid and solid fuels including their analysis. Combustion mechanisms, including air requirements, mixing and ignition in burners. Coal combustion in suspension and in beds.

**CHEE358 PROCESS METALLURGY 1** 5cp

**CHEE365 INTRODUCTION TO MINERAL PROCESSING** 5cp
The concept of ores and minerals, liberation and separation, grade and recovery. Size analysis of solids. Principles of comminution, classification, gravity concentration, heavy medium separation and flotation. Novel physico-chemical separation techniques. Dewatering and tailings disposal.

**Text**

**CHEE366 WASTE MANAGEMENT** 5cp

**CHEE367 ANALYSIS OF POLLUTION** 5cp

**CHEE372 SEPARATION PROCESSES** 10cp
Physical property criteria for separation process selection. Phase equilibria; equilibrium stage and continuous contacting operations; analysis of principal separation processes, including distillation, absorption, extraction, evaporation, humidification, crystallization and drying, hydraulics of mass transfer equipment; stage efficiency, energy requirements; analysis of multiple component separation processes including azeotropic, extractive and complex distillation.

**Text**

**CHEE381 ENGINEERING APPLICATION LABORATORY** 5cp
In addition to formal lecture courses, students undertake relevant practical exercises involving, for example, assembly, installation and operation of equipment. Students will acquire a good level of understanding and experience in the implementation of appropriate safe working practices.

**Text**

**CHEE382 LABORATORY 3** 5cp
A number of open-ended investigations illustrating Year III lecture topics, including experiments on instrumentation and control of process plant.

**CHEE383 LABORATORY 4** 5cp
A number of open-ended investigations illustrating Year III lecture topics, including experiments on instrumentation and control of process plant.

**CHEE401 SPECIAL TOPIC** 5cp
A topic in Chemical Engineering to be approved by Head of Department.

**CHEE421 PROCESS CONTROL AND INSTRUMENTATION** 5cp

**Text**

**CHEE431 KINETICS AND REACTION ENGINEERING** 10cp

**CHEE496 ADVANCED DESIGN PROJECT** 10cp
A major extension to CHEE 495 Design Project.

**CHEE497 RESEARCH PROJECT** 20cp
An experimental or theoretical investigation, or the design, reconstruction and testing of experimental equipment to be reported formally in a project report.

**CHEE498 ADVANCED RESEARCH PROJECT** 10cp
A major extension to CHEE 497 Research Project.

**CHEE511 COAL COMBUSTION** 10cp
The course will cover the current understanding of the principles of coal combustion, including some properties and classification, combustion in furnaces; devolatilisation, ignition, burn-out of char. Emphasis will be given to coal mineral reactions in furnaces and the relation with ash formation, deposition, ash collection, SOx emissions, and trace elements; the relationship between nitrogen and NOx emissions; spontaneous combustion. These principles will finally be used to evaluate the present laboratory techniques for characterising coal.

**CHEE512 COAL TECHNOLOGY** 10cp
The course will cover the existing technologies associated with coal use, particularly those for coal fired plants. Topics covered may include: an introduction to coal geology and mining; coal transport, handling and storage; pulverizing mills; boilers and furnaces; slagging, fouling, erosion; corrosion; ash collection, NOx, SOx and ash handling. An outline of developing firing techniques such as slurry firing, fluidized bed and clean up for gases and solids will also be given.

**CHEE513 FURNACE TECHNOLOGY** 10cp

**CHEE521 CONSTRUCTION PROJECT** 10cp
Principles of coal combustion: Coal properties; Classification; Devolatilization; Ignition; Burn-out of char. Laboratory techniques of characterising coal.

**CHEE523 FUEL TECHNOLOGY** 5cp
Furnace construction and refractories. Heat balances and efficiency. The importance of convection and radiative transfer. The treatment of radiation in furnaces, emitters in coal fired furnaces, surface emissivities and the thermal conductivity of ash layers. The use of the well-mixed furnace model in quantifying the effects of fuel changes (from oil to gas and coal) and operational changes. An introduction to the zone method of analysis. Flames
CHEE452 POWER ENGINEERING PROCESSES 3cp AND THE ENVIRONMENT

CHEE594 INDUSTRIAL SYSTEMS PROJECT 20cp SEMINAR A
The first section of the major project in the Master of Engineering Science - Power Engineering program undertaken in the Department of Chemical Engineering. It is expected that most projects will be of an applied research nature in an area relevant to the candidate's employment and co-supervised by a professional engineer on site. Coursework components will cover areas of problem identification, research skills, communication skills and strategies for applied research. Progress will be reported at seminars given by candidates and by the submission of progress reports in July and November. Satisfactory completion of this subject will result in the award of a result of ungraded pass (UF).

CHEE595 INDUSTRIAL SYSTEMS PROJECT 20cp SEMINAR B
The final section of the major project in the Master of Engineering Science - Power Engineering program undertaken in the Department of Chemical Engineering commenced in CHEE594. Submission of the final Project Report will be required by 31 October followed by formal presentation of the results of the project at a later date. The result awarded for this subject will reflect the quality of the Project Report resulting from the work undertaken in both CHEE594 and CHEE595.

Chemistry Subjects

CHEM101 CHEMISTRY 101 10cp Students who have not studied Chemistry previously are strongly advised to read the first six chapters in the main text (Brown and LeMay) before commencement of the academic year.

Chemistry: (approximately 12 lectures) Revision of basic chemical principles. Introduction to atomic and molecular concepts. Simple ionic and covalent bonding models.

Organic Chemistry: (approximately 24 lectures) Historical development. The shapes, structures and names of organic compounds; reactions of common functional groups; synthesis, differentiation and structural elucidation of organic compounds. Applications of organic chemistry.

Note: The laboratory work will count for 10% of the final assessment but a pass in the laboratory work is a prerequisite for a pass in the subject.

See Faculty of Science and Mathematics Handbook for further information.

Text:

CHEM1102 CHEMISTRY 102 10cp Inorganic Chemistry: (approximately 12 lectures) Inorganic solids and their structures. Simple molecular orbital theory and structure and bonding in metals. Transition metal chemistry, coordination compounds.

Physical Chemistry: (approximately 24 lectures) Chemical equilibria, thermodynamics, electrochemistry, chemical kinetics.

Note: The laboratory work will count for 10% of the final assessment but a pass in the laboratory work is a prerequisite for a pass in the subject.

See Faculty of Science and Mathematics Handbook for further information.

Text

CHEM221 INORGANIC CHEMISTRY 10cp Main group chemistry and transition metal chemistry. Coordination complexes and metal ion-ligand interactions; ionic bonding; symmetry and structure.

Introduction to reactions and mechanisms, synthesis, spectroscopic methods, bonding and ligand field theory in coordination compounds and organometallic chemistry.

Note: The laboratory work will count for 15% of the final assessment but a pass in the laboratory work is a prerequisite for a pass in the subject.

See Faculty of Science and Mathematics Handbook for further information.

Text

CHEM231 ORGANIC CHEMISTRY 10cp A course covering the basic chemistry of aliphatic and aromatic compounds and their spectroscopic properties. An introduction to spectroscopic methods of structure determination (infra-red, proton magnetic resonance, mass spectrometry); acidity and basicity of organic compounds; reactions of aromatic compounds; reactivity of aromatic compounds; reactions of aromatic compounds. An introduction to carbohydrates.

SECTION EIGHT
GUIDE TO SUBJECT DESCRIPTIONS

Note: The laboratory work will count for 15% of the final assessment but a pass in the laboratory work is a prerequisite for a pass in the subject.

See Faculty of Science and Mathematics Handbook for further information.

Text:
As for CHEM211 plus

CHEM261 ENVIRONMENTAL CHEMISTRY 10cp This subject is an introduction to environmental chemistry, focusing on the hydrosphere and the atmosphere. Specific topics include: general introduction; properties, composition, 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.

The laboratory/library/workshop/site visits will count for 15% of the final assessment but a pass in this subject is a prerequisite for a pass in the subject.

See Faculty of Science and Mathematics Handbook for further information.

Text

CHEM321 INORGANIC CHEMISTRY 10cp A general course exploring the range of modern inorganic chemistry, including synthesis, reactivity and applications of spectroscopic methods. Metal Chemistry — transition elements and coordination chemistry; isomerism, f-block elements, inorganic electrochemistry, photochemistry and catalysis. Organometallic Chemistry — main group and transition metal; structure and bonding; cyclic donors, carbonol and olefin complexes; applications to industrial catalysis. Inorganic Spectroscopy — electronic spectroscopy; vibrational spectroscopy; nuclear magnetic resonance spectroscopy; introduction to other methods (e.g. Mossbauer, electron spin resonance, and chiroptical spectroscopy).

Note: 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.

See Faculty of Science and Mathematics Handbook for further information.

Text

CHEM331 ORGANIC CHEMISTRY 10cp Applications of infra-red, 1H and 13C nuclear magnetic resonance and mass spectrometry in structural elucidation. Amino acids, proteins and nucleic acids. Predicting reactivity of organic compounds; detection of short- lived intermediates (arynes and carbenes) and their uses in synthetic chemistry; molecular recognition.

Note: 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.

See Faculty of Science and Mathematics Handbook for further information.

Text
For CHEM321 plus

CHEM361 ENVIRONMENTAL CHEMISTRY 10cp Principles laid down in CHEM261 will be expanded into a more detailed treatment of the chemistry of the hydrosphere, 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; radioactive pollutants in the atmosphere and geosphere; environmental toxicology; the nature, sources, and chemistry of hazardous wastes.

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.

See Faculty of Science and Mathematics Handbook for further information.

Text
Civil Engineering Subjects

CIVL11 MECHANICS AND STRUCTURES 5cp
Compatibility, properties of sections, stress, strain, Mohr's circle. Columns; stability, Buler's formula.
Texts
Atkins, K. J., Teaching Programmes in Mechanic Structures, Science Press.

CIVL13 FLUID MECHANICS 1 5cp
Fluid properties. Fluid statics, stability of submerged and floating bodies, relative equilibrium. Fluid-flow concepts and basic equations of continuity, energy, linear and angular momentum.
Text

CIVL14 ENVIRONMENTAL ENGINEERING 1 5cp
Texts

CIVL191 INDUSTRIAL EXPERIENCE 5cp
CIVL192 INDUSTRIAL EXPERIENCE 5cp
These subject units are designed to formalise periods of Industrial Experience gained by part-time students only. Students will also be required to present a report giving a connected account and critical evaluation of their engineering activities and experience during the year. Such subjects may be counted by part-time students as electives. (See Section 4 of this Handbook).

CIVL192 MECHANICS OF SOLIDS 5cp
Revise stress and strain, extension of bars. Simple statically indeterminate problems, thermal stresses, superposition, strain energy, nonlinear deformation in axially loaded bars. Thin shells subject to internal pressure, Mohr's circle of stresses. Shear strain, generalised stress-strain relations. Axial force, shear force and bending moment diagrams in beams and statically determinate frames. Revise geometrical properties of plan figures, bending stresses and strains, shear stresses in beams, deflection of beams. Shear centre of open thin walled sections, torsion of circular sections, combined stresses, failure criteria. Column stability.

CIVL213 THEORY OF STRUCTURES 1 5cp

CIVL222 MATERIALS 2 5cp
Texts
Hazen, B.S., Fundamentals of Concrete Technology, (Course Notes).

CIVL223 MATERIALS 3 5cp
Concrete manufacture and field control. Properties and behaviour of brick, masonry and timber. Theoretical background and laboratory tests of elastic and inelastic properties, creep, toughness and fracture of metals and timber. Laboratory testing of concrete and component materials.
Text

CIVL224 GEOTECHNICAL INVESTIGATION 10cp
This subject outlines the geological concepts and soil properties that are important in geotechnical design. Techniques for sampling and field investigations will be discussed. The subject provides an introductory basis for later subjects in soil mechanics.

CIVL232 FLUID MECHANICS 2 5cp

CIVL233 FLUID MECHANICS 3 5cp

CIVL242 ENVIRONMENTAL ENGINEERING 2 5cp

CIVL251 SYSTEMS 5cp
SECTION EIGHT
GUIDE TO SUBJECT DESCRIPTIONS

CIVIL382 FINITE ELEMENT METHODS 5cp
Introduction to the finite element method. Emphasis on the
genreality of the technique. Topics covered include Lagrange
interpolation, numerical integration, solution of linear equations,
trust values, beam elements, 2-dimensional solid elements and
the solution of field problems. Theory is reinforced by
programming assignments which use the Civil Engineering finite
element library.

CIVIL410 DYNAMICS AND STABILITY 5cp
Vibration of single degree of freedom systems, lumped mass
systems, multi-degrees of freedom systems, frequency of
vibration, introduction to random vibrations, impulse loading.
Stability concept; vanishing stiffness matrix. Elastic stability of
framed structures using matrix stability functions. Tabulated
solutions.

CIVIL418 THEORY OF STRUCTURES 3 5cp
Yield line analysis of slabs, strip method of design, flat slab
systems. Retaining walls. Basic design of prestressed concrete
structures. Lower bound design of steel structures, approximate
methods of analysis.

CIVIL419 MASONRY AND TIMBER DESIGN 5cp
The properties and behaviour of masonry and its components.
The design of masonry structures including beam development
in high rise construction. The properties and behaviour of timber.
The design of timber structures.

CIVIL420 GEOTECHNICAL ENGINEERING 10cp
Site investigation. Design of shallow foundations, foot foundations,
pied foundations. Soil improvement. Design of embankments,
cuttings, and retaining walls. Applications for geotechnical,
geotechnical computer applications and case studies.

CIVIL429 ROCK MECHANICS 5cp
Index properties and classification, rock strength and failure
criteria, deformation of rocks, in situ stress, planes of weakness,
foundations on rock, underground openings, rock spalls.

CIVIL435 RIVER AND COASTAL
ENGINEERING 5cp
Review and extension of elementary principles of open channel
flow. Erosion by currents, waves, rainfall and overland flow.
Sediment transportation by streams. Measuring devices. Fluvial
morphology, river training. Scour protection at artificial river
constructions. Tides and currents. Waves. Reflection, refraction
and diffraction. Movement of material by the sea, littoral drift.
Coastal protection. River and coastal models.

CIVIL443 WATER RESOURCES 5cp
ENGINEERING
This course considers several areas of applied water resources
engineering emphasizing synthesis of basic principles and design.
Multi-objective planning. Urban drainage: layout and design,
runoff routing, retarding basins. Water supply systems: objectives,
stochastic behaviour, design, operation, modelling.

CIVIL453 CIVIL ENGINEERING DESIGN 1 15cp
Examples of Civil Engineering design in steel and concrete
structures, geomechanics and water resource systems. Visits to
works of interest. Interaction with other professions, regulatory
authorities and practising engineers.

CIVIL454 CIVIL ENGINEERING DESIGN 2 15cp
Further examples as per CIVIL453.

CIVIL455 PROJECT 15cp
Literature review, analytical and/or experimental investigation
of one or more civil engineering design problems. Presentation of
solutions.

CIVIL457 ENVIRONMENTAL ENGINEERING 15cp
DESIGN
This subject will not be offered until 1994
Analysis and design of major case studies. Investigation for
Environmental impact assessment; design of pollution control
systems. Visits to sites of interest, interaction with a broad range of
professionals, regulatory authorities and practising engineers.

CIVIL458 ENGINEERING RISK ASSESSMENT 5cp
Consideration of the assessment and evaluation of risks associated
with a wide variety of engineering projects, including environmental,
mechanical, chemical, geotechnical, water resource and structural engineering projects. The need for risk
assessment in decision-making, decision criteria, probabilistic
description of uncertainty; stochastic processes and natural
phenomena; human error, hazard scenarios; fault and events; complex systems; first order reliability methods; simulation;
updating; prediction.

CIVIL472 HIGHWAY ENGINEERING 5cp
Structure of road pavements; failure modes; pavement design
methods. Material requirements, strength, strain at failure, fatigue,
skid resistance. Testing of materials, subgrade, granular and
stabilized bases, bituminous materials.

Taxis
Austroads, Guide to the Structural Design of Road Pavements.

CIVIL491 SPECIAL TOPIC 5cp
A contemporary topic in civil engineering approved by the Head
of Department.

CIVIL492 SPECIAL TOPIC 5cp
A contemporary topic in civil engineering approved by the Head
of Department.

SECTION EIGHT
GUIDE TO SUBJECT DESCRIPTIONS

Commerce Subjects

COMM101 FINANCIAL ACCOUNTING 10cp
Analysis of the accounting function within the business
environment. The development of a conceptual framework of
accounting with respect to the preparation of conventional financial
reports. Examination of the predominant forms of business
organisation (sole traders, partnerships and companies), the
relative advantages and disadvantages of each form of business
organisation, and the primary conventional accounting methods
applied to record the financial consequences of business
operations.

See Faculty of Economics and Commerce Handbook for further
information.

COMM102 FINANCIAL MANAGEMENT 10cp
Fundamentals
Consideration of fundamental financial management concepts
and practice, and the use of accounting information therein.
Introduction to the Australian capital market, and analysis
and interpretation of financial statements. Development of basic
accounting management techniques to provide data primarily for
internal financial assessments by management, including:
allocation of overheads, product costing, budgeting, cost-volume-
profit analysis, differential analysis and various capital investment
models. These are developed in relation to operating, investment
and financial decisions of a business entity.

See Faculty of Economics and Commerce Handbook for further
information.

Computer Science Subjects

COMP101 COMPUTER SCIENCE I 20cp
Entry to this subject by students other than those enrolled in the
BCOMPSc, B(Computer Engineering) and BINFSc degree
programs is limited by quota. See the Faculty Secretaries for
details.

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

COMP101 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, and interfacing, compiler technology, I/O,
concurrency and pipelining and an introduction to parallel architectures. A 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
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
tools such as "make", "find" and "indent".

COMP206 THEORY OF COMPUTATION 5cp
An introduction to theoretical computer science, covering
material in the areas of formal languages, automata theory and
computability.

COMP212 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.
COMP209 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 compilers. Lexical analysis, parsing techniques, object code generation. Global and peripheral optimisation. Runtime support, error management. Scanner and parser generations.

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, network design, and the like; but the semantics, the meaning or the outcome of the transmission, is not covered. Routine support, error management, and the presence of academic visitors.

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.

COMP308 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 path algorithms. A selection of topics from algorithms for parallel computers, computational geometry, and other related fields.

COMP309 SOFTWARE ENGINEERING 10cp
The subject comprises lectures in first semester plus a major assignment in second semester. After a brief explanation of the nature and life-cycle of large software systems, the software systems design 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 system knowledge, and design 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.

COMP311 SPECIAL TOPIC 1 10cp
A topic of contemporary relevance in computer science.

COMP314 ADVANCED COMPUTER NETWORKS 10cp
An introduction to operating systems. Topics include: virtual memory, remote procedure call, memory coherence algorithms, and the presence of academic visitors.

COMP316 DISTRIBUTED OPERATING SYSTEMS 10cp

COMP317 DATABASE SECURITY 10cp

COMP318 GEOMETRIC ALGORITHMS 10cp
This subject is concerned with the design and analysis of algorithms of a fundamentally geometric nature and their applications in fields such as computer graphics and VLSI design. Topics to be covered include convexity and its applications, computational geometry, and other related fields.

COMP319 SPECIAL TOPIC 2 10cp
A topic of contemporary relevance in computer science.

COMP401 ADVANCED ARTIFICIAL INTELLIGENCE 10cp
Techniques for operative artificial intelligence based on formal logic. The subject includes lectures, tutorials, and practical work.

COMP402 NORMAL SEMANTICS OF PROGRAMMING LANGUAGES 10cp
The syntax of programming languages is generally described quite concisely and unambiguously in syntax diagrams. BNF or context free grammars. Internal representation of compilers. Evaluation of compiler implementation. Practical work in compiler implementation.

COMP403 COMPUTER ARCHITECTURE 10cp
Not offered in 1993.

SECTION EIGHT 10cp

COMP404 PARALLEL COMPUTATION AND VLSI 10cp
An introduction to parallel algorithms and architectures: arrays, trees, hypercubes and related networks. Basic paradigms and principles of parallel algorithm design are emphasised, with rigorous analysis of algorithmic performance.

COMP406 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; transforms - GKS, PHIGS; raster algorithms; minimisation; 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.

COMP407 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-cycle of large software systems, the software systems design 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 system knowledge, and design 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.

COMP408 NATURAL LANGUAGE PROCESSING 10cp
Natural Language is the sort of language spoken and written by people, as opposed to the codes used to instruct computers. Approaches to the processing of Natural Languages (which are very different from computer languages) will be examined.

COMP409 COMPILER DESIGN 10cp
In addition to lectures, students will complete a major 3-phase project. Symbol Table Structures for block structured languages, and special features such as Importing and Exporting. Run-time structures for block structured languages and Abstract Data Types. Implementation of project work consisting of a compiler, machine independent and machine dependent optimisation.

COMP410 ADVANCED COMPUTER NETWORKS 10cp
An investigation of the latest developments in computer network design. Topics include: virtual memory, networks, process migration, remote procedural call, memory coherence algorithms, system stability and data security.

COMP411 SPECIAL TOPIC A 10cp

COMP412 SPECIAL TOPIC B 10cp

COMP413 SPECIAL TOPIC C 10cp

COMP414 SPECIAL TOPIC D 10cp
Each of these subjects consists of a series of lectures and/or practical work in an area of advanced computer science of contemporary interest. The content may vary from year to year according to developments in technology and the presence of academic visitors.

COMP415 GRAPH ALGORITHMS 10cp
Many structures in computing can be modelled as a graph in which nodes represent entities and edges represent relations between entities. This subject covers the theory and implementation of a wide range of operations on graphs.

COMP416 DISTRIBUTED OPERATING SYSTEMS 10cp

COMP417 DATABASE SECURITY 10cp

COMP418 GEOMETRIC ALGORITHMS 10cp
This subject is concerned with the design and analysis of algorithms of a fundamentally geometric nature and their applications in fields such as computer graphics and VLSI design. Topics to be covered include convexity and its applications, computational geometry, and other related fields.

COMP425 HONOURS PROJECT 20cp
A substantial project usually involving a literature review together with a theoretical and/or practical investigation of a computer science problem. This subject is available for students in the MComp degree program who are permitted by the Course Coordinator in Computer Science to meet the requirements of the thesis, which must be a special project. Students are encouraged to gain experience in their area of interest. The project work is embodied in a thesis, two copies of which are required. Students are also required to present a seminar based on their project work. Approval of the Computer Science Advisor is required. The project duration is over two semesters.

COMP435 SPECIAL TOPIC E 20cp
A series of lectures and/or practical work in an area of advanced computer science of contemporary interest. The content may vary from year to year according to developments in technology and the presence of academic visitors.

COMP501 MASTER OF COMPUTING PROJECT PART A 30cp
A major project at Master level usually involving a literature review together with a theoretical and/or practical investigation of a computer science problem. This subject is available for students in the MComp degree program who are permitted by the Course Coordinator in Computer Science to meet the requirements of the thesis, which must be a special project. Students are encouraged to gain experience in their area of interest. The project work is embodied in a thesis, two copies of which are required. Students are also required to present a seminar based on their project work. Approval of the Computer Science Advisor is required. The project duration is over two semesters.
COMP502 MASTER OF COMPUTING PROJECT PART B
30cp
This subject enables completion of the major project requirement of the MComp program commenced in COMP501. The project work is embodied in a thesis, two copies of which are required. Students are also required to present a seminar based on their project work. Attendance at Department of Computer Science seminars, presented by invited speakers, is compulsory.

COMP503 MASTER OF COMPUTING PROJECT
60cp
A major project at Master level usually involving a literature review together with a theoretical and/or practical investigation of a computer science problem. Project work normally commences in February. The project work embodied in a thesis, two copies of which are required. Students are also required to present a seminar based on their project work. Attendance at Department of Computer Science seminars, presented by invited speakers, is compulsory.

Economics Subjects
ECON110 MICROECONOMICS I
10cp
This course is designed to introduce the student to the principles of microeconomics. Microeconomic concepts are concerned with the rules of rationality for decisions made by individuals who wish to maximise their well-being and the impact these decisions have upon the allocation of resources throughout an economy or society. While emphasis throughout the course is on the theoretical underpinnings of microeconomics, the concepts are used to give insight into contemporary issues and problems.

Texts

ECON111 MACROECONOMICS I
10cp
This course introduces students to macroeconomic concepts, principles and policy. Topics covered include national income accounting, income determination, inflation, the balance of payments, monetary and fiscal policy.

Texts

ECON371 PRINCIPLES OF ECONOMICS
10cp
Not offered in 1993. Students intending to take this subject should take SURV417 Industrial and Other Surveying in 1993 and take ECON371 in 1994.

An introduction to the fundamental theorems and principles of modern economic thought and their application to the real world problems arising in the context of regional and urban planning. Micro- and macro-economic principles will be introduced as required. Major problems to be examined: backward and undeveloped regions, unemployment, labour migration policies for balanced regional growth, urban growth, sprawl, slum development, poverty and crime, traffic congestion, pollution, and declining quality of life.

Other Economics and Commerce subjects may be taken as electives in most programs and are described in the Faculty of Economics and Commerce Handbook.

Electrical and Computer Engineering Subjects
ELEC101 INTRODUCTION TO ELECTRICAL 5cp AND COMPUTER ENGINEERING
A course intended to give a broad introduction to practical and theoretical aspects of electrical and computer engineering.

ELEC130 ELECTRICAL ENGINEERING I
10cp

Text

ELEC170 COMPUTER ENGINEERING
10cp
Enrolment in this subject is limited to students enrolled in the BE program in Computer Engineering. Electrical Engineering, Industrial Engineering and Mechanical Engineering or the BComp program.


Test

ELEC192 INDUSTRIAL EXPERIENCE
5cp

ELEC193 INDUSTRIAL EXPERIENCE
5cp

ELEC194 INDUSTRIAL EXPERIENCE
5cp

ELEC195 INDUSTRIAL EXPERIENCE
5cp

These subjects are designed to formalise periods of Industrial Experience gained by part-time students only. Each of the Industrial Experience units is equivalent to 5 credit points. Students will also be required to present a report giving a connected account and critical evaluation of their engineering activities and experience during the year. Such units may be counted by part-time students as electives. (See Section 4 of this Handbook.)

ELEC197 INDUSTRIAL EXPERIENCE
10cp
This 10 credit point elective is available to "sandwich" course students only. The student must be in appropriate full-time employment for one calendar year from 1st July in the year preceding enrolment to 30th June in the year of enrolment. A diary must be kept, a seminar presented, and a detailed report submitted to the student's adviser. The report must indicate that the student has been engaged in a major engineering project.

ELEC210 INTRODUCTION TO ENERGY SYSTEMS
10cp

ELEC211 ELECTRICAL ENERGY CONVERSION
5cp
This subject is offered as a service subject and is not available to students enrolled in the Computer Engineering or Electrical Engineering programs.

Discussion of energy conversion possibilities: Examination of typical electrical supply systems; magnetic circuits; transformers; three phase power; elementary rotating machines; direct current machines; induction machines; demonstration of DC machines; synchronous machines; electronic power conversion and control systems.

ELEC220 ELECTRONICS I
10cp
An introductory subject on the physics of electronic devices and the design of discrete component electronic circuits. Basic characteristics of diodes, zener diodes, bipolar transistors, field effect transistors, single stage amplifiers (gain, input-output resistance). Basic digital logic gates, TTL and CMOS inverters and/or gates.

Test
Hornstein, M.N., Microelectronic Circuits and Devices, Prentice-Hall.

ELEC231 ELECTRICAL CIRCUITS
10cp

ELEC311 ELECTRICAL POWER
10cp

Text

ELEC312 ELECTRICAL SYSTEMS
5cp

ELEC321 LINEAR ELECTRONS
10cp

Text

ELEC322 POWER ELECTRONICS
5cp
ELEC594 ADVANCED DIGITAL SIGNAL PROCESSING

Advanced techniques in recursive filter design: bandwidth, ambiguity functions, two-dimensional imaging, array processing.

ELEC571 COMPUTER AND ELECTRONICS SEMINAR 1

ELEC572 COMPUTER AND ELECTRONICS SEMINAR 2

ELEC573 COMPUTER AND ELECTRONICS SEMINAR 3

Each subject consists of a series of seminars for research postgraduate students. Each student will prepare a seminar on research literature.

ELEC581 PROJECT

Available to M.Eng.Sc students only.

ELEC582 PROJECT

Available to M.Eng.Sc students only.

ELEC591 SYSTEMS AND CONTROL SEMINAR 1

ELEC592 SYSTEMS AND CONTROL SEMINAR 2

ELEC593 SYSTEMS AND CONTROL SEMINAR 3

Each subject consists of a series of seminars for research postgraduate students. Each student will prepare a seminar on research literature.

ELEC594 INDUSTRIAL SYSTEMS PROJECT/ 20cp SEMINAR A

The first section of the major project in the Master of Engineering Science - Power Engineering program undertaken in the Department of Electrical and Computer Engineering. It is expected that most projects will be of an applied research nature in an area relevant to the candidates employment and co-supervised by a professional engineer on site. Coursework components will cover areas of problem identification, research skills, communication skills and strategies for applied research. Progress will be reported at seminars given by candidates and by the submission of progress reports in July and November. Satisfactory completion of this subject will result in the award of a result of ungraded pass (UP).

ELEC595 INDUSTRIAL SYSTEMS PROJECT/ 20cp SEMINAR B

The final section of the major project in the Master of Engineering Science - Power Engineering program undertaken in the Department of Electrical and Computer Engineering commenced in ELEC594. Submission of the final Project Report will be required by 31 October followed by formal presentation of the results of the project at a later date. The result awarded for this subject will reflect the quality of the Project Report resulting from the work undertaken in both ELEC594 and ELEC595.

ELEC641 ADAPTIVE CONTROL


Text


ELEC642 ESTIMATION AND SYSTEM IDENTIFICATION


Text

de Souza, C. and Goodwin, G.C., Estimation and System Identification.

ELEC643 NONLINEAR CONTROL

Emphasis modern theory for synthesis of controllers for nonlinear multivariable systems.

Text


ELEC645 ADVANCED TOPICS IN CONTROL

Variable content emphasising recent developments.

ELEC646 ADVANCED TOPICS IN SYSTEMS THEORY

Variable content emphasising recent developments.

ELEC647 ADVANCED TOPICS IN SYSTEMS THEORY

Variable content emphasising recent developments.

ELEC661 COMPUTER NETWORKS

Network architectures and topologies. Local network and examples. Distributed operating systems.

Text


ELEC662 ADVANCED TOPICS IN COMPUTERS

Variable content emphasising recent developments.

Environmental Science Subjects

SC102 ENVIRONMENTAL PLANNING AND POLLUTION CONTROL

This course examines the environmental planning and development control system in NSW. Reference is also made to current pollution control legislation. The emphasis in this course is to understand the system which controls development 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.

Text


SC3020 ENVIRONMENTAL IMPACT ASSESSMENT TECHNIQUES

This course will examine the rationale and methodology of environmental impact assessment (EIA) and will look at number of impact assessment techniques in practice. The phenomenon 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.

Text


See Faculty of Science and Mathematics Handbook for further information.

Geography Subjects

GEOG101 INTRODUCTION TO PHYSICAL GEOGRAPHY

An introduction to physical geography including meteorology and climate; the influence of geographic processes on landscapes; weathering, rivers, ice, frost, wind and the sea; the physical, chemical and biological characteristics of the soil and the development of soil profiles; environmental and historical factors that influence plant distribution. Practical work includes an introduction to the study of climatic data and maps, and the use of topographic maps and aerial photographs for landform analysis.

GEOG202 INTRODUCTION TO HUMAN GEOGRAPHY

An introduction to human geography including cultural, population, economic, development and urban geography. Practical work includes an introduction to elementary statistical data and its representation by thematic maps in human geography.

Geology Subjects

GEOI01 THE ENVIRONMENT

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 man; the impact of climatic change; mineral resources and society.

See Faculty of Science and Mathematics Handbook for further information.

Additional Geology subjects are described in the Faculty of Science and Mathematics Handbook.

Information Science Subjects

INFO101 INTRODUCTION TO INFORMATION SYSTEMS

Computers have made it possible to store and retrieve massive amounts of data, the "information age" is now a reality. This course introduces the skills and concepts needed to fully exploit the power of this new tool. After completion of the subject, students will understand how and why organisations build and use information systems, will be able to document information flow through particular systems, and will be able to use the microcomputer as a personal support tool. The course provides a solid grounding in computers and their use, which today is important for all students, irrespective of the discipline which they are studying.

Topics covered include: The evolution of computer hardware and software. Systems and their characteristics, the components of an Information System (hardware, software, data and people). Examples of computer based Information Systems. Problems which can/cannot be solved using computers. Types of Information systems, formal/informal, public/private. Types of problems structured/unstructured. The computer as a personal support tool, word-processing, spreadsheets, data base management. The importance of people in the information network, the social, organisational and personal implications of computer based information systems.

INFO102 INFORMATION STORAGE AND MANAGEMENT

The design and implementation of the data repository for any computer based information system is a skilled and extremely critical task. Overall performance of the system will be seriously compromised by an inefficient data storage and retrieval strategy. This subject introduces the tools needed to design, implement and maintain computer based database systems. It will be of particular interest for students who will need to design and/or access large databases regularly in their chosen profession.

Topics covered include: Storage and representation of data in computer systems. Data types, records, file structures and access mechanisms. Standard file maintenance procedures. Introduction to COBOL, a businesslike oriented third generation language. Semi-structured data modelling, entity relationship modelling, functional dependency and other constraints on attribute values. Introduction to database management systems, the hierarchical, network and relational models. Data manipulation languages, with particular emphasis on relational techniques using SQL. Physical database design, normalisation.

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EIGHT  

GUIDE TO SUBJECT DESCRIPTIONS  

INFO202 ANALYSIS OF INFORMATION SYSTEMS  
10cp  
Structural analysis and design methodology will be introduced. Specific topics include: Characteristics of a system. Information systems. The role of the system analyst. Interview techniques, Report writing. Documentation techniques (data flow diagrams, data dictionary, flowcharts, etc). Cost benefit analysis. Implementation techniques.  

INFO203 INFORMATION SYSTEMS DESIGN  
10cp  
Using the techniques introduced in Information Systems Analysis students will work in small groups to design and implement small on-line computer based information processing systems. Specific topics include: file design techniques, form design, security controls and backup, system testing and implementation, the ongoing maintenance of systems.  

INFO204 COMMERCIAL PROGRAMMING  
10cp  
COBOL as a business processing and file organisation language. Basic concepts of file handling and maintenance. Sequential, relative and indexed sequential file organisation. Structured techniques, as applied to COBOL programming, are emphasised. Structure diagrams, pseudo-code, programming standards, etc. Students are expected to complete assignments using both COBOL 74 and COBOL 85. 

Graduate Diploma students who enrol in this subject but have not completed INFO 102 should obtain INFO 102 COBOL notes from the Department of Management prior to the commencement of classes.  

Law Subjects  

LAW101 FOUNDATIONS OF LAW  
10cp  
This subject consists of a study of basic legal concepts, the division of law, and the institutions of the Australian legal system. It also enables students to acquire special skills for the examination of legal materials, such as an ability to analyse statements contained in judgements and to interpret provisions of statutes. Foundations of the processes of law-making through judicial decisions, and primary and delegated legislation are considered in detail.  

Text  


LAW201 LEGAL PROCESS  
5cp  

LAW202 PROPERTY AND SURVEY LAW  
5cp  
The notion of property. Classifications of property. Estates in land; interests in land; systems of title to land; dealing with land; statutory control of land use with particular reference to the Local Government Act 1919 (N.S.W.). The regulation and legal liability of surveyors. Survey investigations and searches.  

Texts  
Halligan, F. 1973, Legal Aspects of Boundary Surveying as apply in New South Wales, Inst. of Surveyors Aust.  

Willis, Notes on Survey Investigations, NSW Government Printer. LAW 291 and LAW 292 are service subjects offered by the Department of Law. Other Law subjects may be taken as electives in most programs and are described in the Faculty of Economics and Commerce Handbook.  

Mathematics Subjects  

MATH102 MATHEMATICS 102  
10cp  

Texts  
1992, Mathematics 102 Tutorial Notes, University of Newcastle.  


MATH103 MATHEMATICS 103  
10cp  

An introduction to statistics: exploratory data analysis, uncertainty and random variation, probability, use of Minitab. See Faculty of Science and Mathematics Handbook for further information.  

Texts  
1992, Mathematics 103 Tutorial Notes, University of Newcastle.  

MATH111 MATHEMATICS 111  
(5cp)  

Texts  
1992, Tutorial Notes for Mathematics 111, University of Newcastle.  

MATH112 MATHEMATICS 112  
(5cp)  

MATH201 MULTIVARIABLE CALCULUS  
5cp  
Partial derivatives, Vector operators, Taylor’s Theorem, Line integrals, Multiple and surface integrals, Gauss, Green, Stokes’ Theorems. See Faculty of Science and Mathematics Handbook for further information.  

Texts  
1992, Mathematics II Tutorial Notes, University of Newcastle.  

MATH202 PARTIAL DIFFERENTIAL EQUATIONS  
5cp  

Texts  
1992, Mathematics II Tutorial Notes, University of Newcastle.
Additional review (historical perspective) of Science

Communication also examines aspects of individual and group behaviour including leadership, teamwork and organisational levels. The course provides a critical overview of the role of the systems analyst, the system life cycle, interview techniques, report writing, documentation techniques (data flow diagrams, data dictionary, flowcharts, etc.), cost/benefit analysis, implementation techniques. The practical relevance/applications of the theories and models, exposed during computer and information processing systems, are highlighted through tutorial case studies, mini-project assignments and in-class experimental exercises which emphasise linkages between the two disciplines.

**MNGT03 COMPUTING AND INFORMATION 10cp**

This course is designed to provide students with an overview of information systems in today's business environment. The course will introduce personal support software available on microcomputers and their applications to management decision making. During compulsory workshop sessions students will gain "hands on" experience using software packages such as electronic spreadsheets, database management systems, and word processing.

**MNGT11 MANAGEMENT INFORMATION 10cp**

This course is designed to expose potential managers to the variety of management information systems available today. The aim is to emphasise the role of the computer in the planning function, rather than simply in the day-to-day transaction based systems. Specific topics covered will include: data management systems, distributed versus centralised processing, the role of the microcomputer, decision support systems, expert systems, security and privacy implications.

**MNGT12 SYSTEMS ANALYSIS 10cp**

Structured analysis and design methodology will be introduced. Specific topics include: characteristics of a system, information systems, the role of the systems analyst, the system life cycle, interview techniques, report writing, documentation techniques (data flow diagrams, data dictionary, flowcharts, etc.), cost/benefit analysis, implementation techniques.

**MNGT13 SYSTEMS DESIGN 10cp**

Using the techniques introduced in MNGT1.2 Systems Analyst students will work in small groups to design and implement small on-line computer based information processing systems. Specific topics include: file design techniques, form design, security controls and backup, system testing and implementation, the ongoing maintenance of systems.

Additional Management subjects are described in the Faculty of Science and Mathematics Handbook.

**Mechanical Engineering Subjects**

**MECH101 INTRODUCTION TO MECHANICAL ENGINEERING 5cp**

Manufacturing techniques and materials related to mechanical engineering processes and design. Seminars and plant visits intended to enhance understanding of the mechanical engineering degree coursework and the role of the professional engineer in industry and society.

**MECH102 PROGRAMMING 5cp**

An introduction to the use of computers and computer programming in Engineering. The programming language is FORTRAN 77, a high level language. Emphasis is placed on the development of a good programming style and on the logical development of a program. Lectures will cover variable types and their uses, file and data handling, functions, subroutines, arrays, the computer operating system and text editors. Assessment is based partly on programs written by students.

**MECH103 ENGINEERING CHEMISTRY 5cp**

A introduction to the fundamentals of chemistry which are exemplified by engineering applications. Basic concepts are introduced in the course, are highlighted through tutorial case studies, mini-project assignments and in-class experimental exercises which emphasise linkages between the two disciplines.

**MECH104 EXPERIMENTAL METHODS 1 5cp**

A series of laboratory experiments designed to give the student familiarity with mechanical, optical and electrical systems used to measure basic physical quantities such as length, strain, pressure, temperature, force, torque and fluid flow. Interpretation of experimental data and basic principles of error analysis. Proficiency in technical report writing is emphasised.

**MECH11 ENGINEERING DRAWING 5cp**

A study of the basic fundamentals of technical graphics with an emphasis on communication and visualisation. The subject matter is reviewed using CAD, drafting and freehand techniques. The use and interpretation of orthographic projection in engineering
This course is concerned with developing a student's ability to write computer programs that use numerical analysis techniques. The main emphasis is on computing. The programming work of MECH102 is extended to include some advanced FORTRAN programming techniques, the use of graph-plotting routines and the use of computer libraries such as the NAG library. Emphasis is placed on curve fitting to well-ordered data and to experimental data and the differentiation and integration of such data. Systems of equations, both linear and non-linear, are considered. Other material covered includes solution of ordinary differential equations and partial differential equations.

Text


MECH211 MECHANICAL ENGINEERING 10cp DESIGN I
Philosophy and fundamentals of mechanical engineering design. Conceptual design problems. Advanced mechanical engineering drawing using CAD including geometric tolerances, surface finish, symbols. Technology of design.

MECH212 DESIGN OF MACHINE COMPONENTS
Basic components of mechanisms and machinery. Load and stress calculations, allowable stresses and factors of safety. Design of standard machine components such as shafts, brackets, levers, springs and bolted connections.

Text

MECH221 MATERIALS 2 5cp
The mechanical behaviour and properties of engineering materials and how they are affected by the environment and by use. An introduction to the factors governing the selection of materials. The topics treated will include equilibrium and non-equilibrium effects, i.e. martensitic transformations, heat treatments, TTT diagrams and welding. Creep, fatigue and fracture. Friction and wear.

Text

MECH222 DYNAMICS

MECH223 DYNAMICS 10cp

Text

MECH241 MECHANICS OF SOLIDS I 5cp
Uniaxial loading, states of stress and strain, stress and strain relationships, internal forces, internal stresses, deflection of beams, torsion, buckling.

Text

MECH251 FLUID MECHANICS I 5cp
Fluid properties and definitions. Fluid statics: forces on surfaces, buoyant forces. Types of flow, continuity equation, Euler and Bernoulli equations, energy equation, linear and angular momentum applications. Introduction to dimensional analysis. Analysis of fluid machinery.

Text

MECH271 THERMODYNAMICS I 5cp

Text

MECH304 EXPERIMENTAL METHODS 2 10cp
Selected engineering laboratory experiments designed to extend the concepts of experimental procedures and to complement formal subject matter in the course.

MECH305 NUMERICAL METHODS 5cp

MECH309 INTRODUCTION TO NOISE POLLUTION CONTROL

MECH314 MECHANICAL ENGINEERING 15cp DESIGN 2

Texts

MECH315 COMPUTER AIDS AIDED DESIGN 5cp
Students intending to enrol in this subject who completed MECH213 prior to 1989 and who were granted credits in the subject or in MECH211 should consult the Head of Department regarding bridging work in CAD to be undertaken in February and completed prior to commencement of classes in MECH315. The CAD/CAM geometric environment. 2-Dimensional drawing, solids modelling, surface modelling and macro programming. Construction of basic geometric entities; points, lines, circles, arcs, profiles, surfaces and solid primitives. Manipulation of views, windows and levels. Preparation of objects, templates and patterns. Editing, CSG using Boolean operations on solid primitives. Sectioning. Assemblies. Pictorial presentations. Preparation of part masters. Interface to analysis packages.

MECH316 FINITE ELEMENT METHODS IN DESIGN
Basic concepts of finite element techniques. Introduction to finite element computer packages and their use as tools in Mechanical Engineering design. Application to problems of stress analysis of complex shapes, thermal stresses and vibrations.

Text

MECH317 BULK MATERIALS HANDLING 5cp SYSTEMS 1

Text

Selected research papers

MECH318 CONVEYING OF BULK SOLIDS 5cp
Comparison based on economic and technical considerations of different modes of continuous and discontinuous transportation of bulk solids. Overview of freight pipelines - pneumatic, hydraulic and capstain - and mechanical conveying - belt, screw and bucket elevators. Technical and economic considerations in the design of conveyors. Examples will be selected from the continuous conveyor systems mentioned above. In the case of belt conveyors the dynamic characteristics and the influence of these characteristics on design will be studied in some detail. In the case of pneumatic conveyors, the design of both line and dense phase systems will be discussed.

Texts

MECH321 MATERIALS 3 5cp
This subject deals with metals, polymers, ceramics, composites and biomaterials in conjunction with the following topics: review of traditional strength tests; fundamentals of fracture mechanics, rate, environment and temperature effect on toughness; fatigue crack propagation; scaling in static fracture and fatigue fracture; classification of materials according to mechanical properties.

Text

MECH324 CERAMIC SCIENCE AND TECHNOLOGY
Discussion of the engineering properties of ceramics and how these properties are dependent on atomic structure, chemical composition, microstructure and processing. Structures of oxides, silicates and glasses. Polarity defects and doping. Grain boundaries. Phase transformations. Firing - grain growth, sintering and vitrification. Microstructures. Mechanical and electrical properties.

Texts

MECH325 POLYMER SCIENCE AND TECHNOLOGY
Study of the engineering properties of polymers and how these
MECH326 FABRICATION OF METALS 5cp
An introduction to the common metal working techniques and the effects these processes have on the properties of the finished product. Topics presented will be taken from: Rolling, Forging, Deep Drawing, Wire and Tube Drawing, Casting, Extrusion and Powder Metallurgy.

Text
Dieter, G.E., Mechanical Metallurgy, McGraw-Hill.

MECH333 DYNAMICS OF MACHINES 5cp

Texts

MECH342 MECHANICS OF SOLIDS 2 5cp

Texts
MECH352 FLUID MECHANICS 2 10cp
Kinematics of fluids. Dynamics of incompressible fluids. Similarity and the application of dimensional analysis. Exact solutions of the Navier-Stokes equations. Hydrodynamic lubrication. Laminar and turbulent flows. The course includes a number of laboratory experiments dealing with the above topics.

Text
Antonia, R.A., Notes for Fluid Mechanics II, Department of Mechanical Engineering, University of Newcastle.

MECH361 AUTOMATIC CONTROL 10cp

Text

MECH372 HEAT TRANSFER 1 5cp

Text
White, F.M. 1984, Heat Transfer, Addison-Wesley.

MECH373 THERMODYNAMICS 2 5cp
First and second law analysis of processes and cycles. Advanced analysis of steam power plants, gas turbine systems and refrigeration plants. Air-vapour mixtures, psychometry, air-conditioning systems. Reactive mixtures; equilibrium equations, first law analysis, equilibrium constants. Direct energy conversion systems.

Text
As for MECH372

MECH381 METHODS ENGINEERING 5cp

Text
Stevenson, M.G., Methods Engineering, UNSW Press.

MECH382 ENGINEERING ADMINISTRATION 5cp

MECH383 QUALITY ENGINEERING 5cp

MECH384 ENGINEERING ECONOMICS 1 5cp

MECH386 COMPUTER AIDED MANUFACTURING 5cp

Text

MECH387 OPERATIONS RESEARCH 1 5cp
Concept of optimisation; Optimisation approaches; Formulation of Models; Linear Programming; Allocation and Assignment; Simplex Method; Duality; Theory of Games, Parametric Programming; Decomposition principle. Network theory; Dynamic Programming. Geometric programming. Applications.

Texts

MECH388 OPERATIONS RESEARCH 2 5cp
Statistical decision theory; Forecasting methods, moving average exponentially smoothed average. Inventory control theory. Fixed order quantity; fixed order cycle systems; Production - inventory systems. Queueing theory; single queue, multi-server queues. Queues in series. Transcients in queues; simulation of systems.

Applications
As for MECH387

MECH405 COMPUTATION OF TURBULENT FLOWS 5cp
Integral methods for solving engineering turbulent flow problems. Introduction to turbulence modelling ideas. Use of existing software packages such as PHOENICS to solve engineering problems.

MECH407 ENVIRONMENTAL ENGINEERING 5cp
Physical and chemical interaction of air pollutants on the local and global scale. Meteorology, atmospheric diffusion models and ambient measurements of air pollutants and the control of exhausts from mobile and stationary sources.

MECH408 MACHINE CONDITIONING 5cp

MECH412 BULK MATERIALS HANDLING 5cp

MECH415 MECHANICAL ENGINEERING DESIGN 3
Advanced design topics including the analysis of complete systems, principles of materials selection, the interaction of design geometry, material properties and fabrication processes in mechanical design. Selected projects including the development of computer packages as an aid to component selection, data bases and knowledge bases in systematic approaches to materials selection.

MECH418 MAINTENANCE MANAGEMENT 5cp

MECH421 COMPOSITES IN ENGINEERING 5cp
Strengthening principles of composites and fibre reinforcement. Engineering properties and forms available of constituent materials (fibres and matrix material). Strength, fatigue, failure and design. Introduction to manufacturing processes.

Text
Tsu, S.W and Ilhan, H.T. 1908, Introduction to Composite Materials, Technomic.

MECH431 ROBOTICS 5cp
Basic concepts, classification, operation and control of robotics systems, control design, kinematic analysis and co-ordinate transformations, trajectory interpolation, programming, applications, sensors and intelligent robots, computer integrated manufacturing systems.

Text

MECH453 INTRODUCTION TO TURBULENCE 5cp

Text
MECH473 THERMODYNAMICS 3 5cp
Thermodynamic relations; the Maxwell relations; general equations for enthalpy, internal energy and entropy; compressibility factor; equations of state; generalised chast for enthalpy and entropy. Availability concepts and applications. Statistical thermodynamics of irreversible processes. Applications of statistical thermodynamics. Direct energy conversion.

Text

MECH474 HEAT TRANSFER 2 5cp
Development of the general forms of the continuity, momentum and energy equations. Application of these equations to a range of convection heat transfer problems. Advanced conduction and radiation heat transfer. Heat transfer with change of phase.

Text

MECH484 ENGINEERING ECONOMICS 2 5cp

MECH485 PRODUCTION SCHEDULING 5cp

MECH496 PROJECT/SEMINAR 25cp
Major undergraduate project usually consisting of literature survey and review, analytical and/or experimental investigation into a mechanical or industrial engineering topic. Presentation of two seminars. Briefing sessions and weekly guest seminars are mandatory. Two (2) copies of the Project Report are required.

MECH497 PROJECT/DIRECTED READING 5cp
Private work of laboratory, literature search or theoretical nature requiring preparation of a report. Work will be undertaken at the direction of a supervisor with whom the topic should be negotiated. The work undertaken in this subject may form part of an extended MECH496 project or an independent topic.

MECH498 PROJECT/DIRECTED READING 10cp
Private work of laboratory, literature search or theoretical nature requiring preparation of a report. Work will be undertaken at the direction of a supervisor with whom the topic should be negotiated. The work undertaken in this subject may form part of an extended MECH496 project or an independent topic.

MECH516 FINITE ELEMENT METHODS IN DESIGN 5cp
Basic concepts of the finite element technique. Introduction to a finite element computer package. Finite element as a tool for mechanical design. Application of a range of element types to the solution of linear-elastic stress problems. Introduction to vibration analysis.

MECH517 BULK MATERIALS HANDLING SYSTEMS 5cp

Text

MECH518 CONVEYING OF BULK SOLIDS 5cp
Comparison based on economic and technical considerations of different modes of continuous and discontinuous transportation of bulk solids. Overview of freight pipelines: pneumatic, hydraulic and capapule - and mechanical conveying - belt, screw and bucket elevators. Technical and economic considerations in the design of conveyor systems. Examples will be selected from the continuous conveyor systems mentioned above. In the case of belt conveyors, the dynamic characteristics and the influence of these characteristics on design will be studied in some detail. In the case of pneumatic conveyors, the design of both lean and dense phase systems will be discussed.

Texts

MECH519 MAINTENANCE MANAGEMENT 5cp

MECH584 ENGINEERING ECONOMICS 5cp
Review of basic principles of micro-economics - scarcity and choice, supply and demand, market system. Review of basic principles of accounting: financial statements; working capital; capital expenditure; budgets; costing; overheads; marginal cost.

MECH594 INDUSTRIAL SYSTEMS PROJECT/SEMINAR A 20cp
The first section of the major project in the Master of Engineering Science - Power Engineering program undertaken in the Department of Mechanical Engineering. It is expected that most projects will be of an applied research nature in an area relevant to the subjects employed and co-supervised by a professional engineer on site. Coursework components will cover areas of problem identification, research skills, communication skills and strategies for applied research. Progress will be reported at seminars given by candidates and by the submission of progress reports in July and November. Satisfactory completion of this subject will result in the award of a result of ungraded pass (UP).

MECH595 INDUSTRIAL SYSTEMS PROJECT/SEMINAR B 20cp
The final section of the major project in the Master of Engineering Science - Power Engineering program undertaken in the Department of Mechanical Engineering commenced in MECH594. Submission of the final Project Report will be required by 31 October followed by formal presentation of the results of the project at a later date. The result awarded for this assessment reflects the quality of the Project Report resulting from the work undertaken in both MECH594 and MECH595.

MECH596 PROJECT 30cp
A major project for MEngSc students. Work will be undertaken at the direction of a supervisor with whom the topic should be negotiated. Two (2) copies of the Project Report are required.

MECH597 PROJECT 35cp
A major project for MEngSc students. Work will be undertaken at the direction of a supervisor with whom the topic should be negotiated. Two (2) copies of the Project Report are required.

MECH598 PROJECT 40cp
A major project for MEngSc students. Work will be undertaken at the direction of a supervisor with whom the topic should be negotiated. Two (2) copies of the Project Report are required.

Philosophy Subjects

PHIL101 INTRODUCTION TO PHILOSOPHY 20cp
First Semester: Book I of Hobbes' classic Leviathan will be read; it will be explained and expounded in detail to bring out the Hobbesian view of world systematically, the worldview of liberalism that underlies western democracy (1 hour per week). A segment on morality discusses the nature of justice and some views on time will and on the basis of morality (1 hour per week). A segment on critical reasoning aims to develop skills in analysing, evaluating and advancing arguments, considerable emphasis being placed on arguments as they naturally occur, and on re-examining as an everyday practice (1 hour per week).

Second Semester: Some of Plato's dialogues will be read, and the ethical, political and metaphysical questions raised by them will be systematically explained (3 hour per week). A segment on knowledge and reality examines some questions about belief and knowledge, the mind/body relationship, and the existence of God (1 hour per week). A segment on the historical development of scientific explanation and an introduction to the theory of scientific method (1 hour per week).

Preliminary Reading
Nagel, T., What Does It All Mean?, Oxford U.P.

Texts

Hospers, J., An Introduction to Philosophical Analysis, Routledge.


Sparks, A.W., Argument Diagrams and Logical Relations, Pergamon.

Sparks, A.W., Talking Philosophy, Routledge.

PHIL242 BASIC SYMBOLIC LOGIC 5cp
A basic introduction to sentential and predicate calculus, including notations, interpretation, satisfiability, validity and proof construction. Part of the course will deal with the reduction of formal systems into clause form to enable their expression in FROLOG.

Text

PHIL391 TECHNOLOGY AND HUMAN VALUES I 10cp
A course of lectures and discussions focussing on the economic, political, social and ethical issues that arise in technological design decisions. The course is presented in two parallel strands. Strand A is based on an examination of energy policy. This example of decision making is used to develop an awareness of (1) how non-technical dimensions enter design decisions and (2) a systematic approach to public policy making. Strand B complements Strand A by introducing a range of additional topics which broaden the horizon of consideration and deepen the treatment of specific features of decision making.

Texts (Strand A)


PHIL392 TECHNOLOGY AND HUMAN VALUES 2 10cp

Not offered in 1993.

A team project on the role of technical and value factors in technological decision making. Students will form small teams under staff leadership for a year-long intensive study of a specific example of technological decision making. The aim is to provide a comprehensive and accurate understanding of the interaction between technical and value factors in the decision. Each team will produce a report of a quality equal to management/ministerial discussion. Evaluation will be by the Team Report plus staff leader/team's assessment of individual contributions. Example projects are Nuclear Electric Power for Australia, A Study of Technology Assessment. A wider variety of projects can be undertaken, selection by teams will occur during the first two weeks of semester.

PHIL591 TECHNOLOGY AND THE ENVIRONMENT 10cp


Additional Philosophy subjects are described in the Faculty of Arts Handbook.

Physics Subjects

PHYS101 PHYSICS 101 10cp

This is an introductory course in physics concentrating primarily on the core topics of classical physics. The lecture course consists of three main strands: mechanics; electromagnetism; waves, optics and thermal physics. There will also be 3 hrs/week of laboratory work as well as tutorial sessions.

See Faculty of Science and Mathematics Handbook for further information.

PHYS102 PHYSICS 102 10cp


See Faculty of Science and Mathematics Handbook for further information.

PHYS103 PHYSICS 103 10cp

Advanced mechanics, electromagnetism, waves and optics and thermal physics will be treated in a rigorous way utilizing calculus and stressing the unifying principles in the development of the physical concepts. There will also be a total of 3 hrs per week associated with laboratory and tutorials.

See Faculty of Science and Mathematics Handbook for further information.

PHYS201 QUANTUM MECHANICS AND ELECTROMAGNETISM 10cp

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

See Faculty of Science and Mathematics Handbook for further information.

PHYS202 SOLID STATE AND ATOMIC PHYSICS 10cp

Solid state physics and applications, atomic physics and spectroscopy, optics and laser physics.

See Faculty of Science and Mathematics Handbook for further information.

Additional Physics subjects are described in the Faculty of Science and Mathematics Handbook.

Psychology Subjects

PSYC101 PSYCHOLOGY INTRODUCTION 1 10cp

Three written laboratory reports. Introductory Methodology and Statistics for Psychology; Biological Foundations; Perception and Learning.

See Faculty of Science and Mathematics Handbook for further information.

Tests

General — any recent comprehensive text on General Psychology or Introduction to Psychology. The following alternatives are recommended (others may be added later):


For Statistics course


PSYC102 PSYCHOLOGY INTRODUCTION 2 10cp

Three written laboratory reports. Cognition; Social Psychology; Developmental Psychology.

See Faculty of Science and Mathematics Handbook for further information.

Tests


Additional Psychology subjects are described in the Faculty of Science and Mathematics Handbook.

Statistics Subjects

STAT203 QUEUES AND SIMULATION 5cp

Random number generation. Simulation, including the use of MINITAB.

See Faculty of Economics and Commerce Handbook for further information.

STAT205 ENGINEERING STATISTICS 5cp

Basic probability theory and principles of statistical inference. Distributions, error propagation. Quality control.

See Faculty of Economics and Commerce Handbook for further information.

Additional Statistics subjects are described in the Faculty of Science and Mathematics Handbook.

Surveying Subjects

SURV111 SURVEYING 1 10cp

Elementary surveying principles. Nature, causes and classes of errors; elementary error propagation. Linear measurement with tapes. Ordinary differential levelling. Theodolite; angle measurement; magnetic compass. Field notes, traversing and traverse calculations; simple plan drawing.

Text


SURV112 SURVEYING 2 10cp

Plane table; contour surveys by stadia; detail surveys, route surveys, areas, volumes, horizontal curves, transition curves, vertical curves. A brief history of surveying and surveying instruments. A three-day series of field work exercises form a compulsory component of this subject.

Text


SURV191 INDUSTRIAL EXPERIENCE 5cp

SURV192 INDUSTRIAL EXPERIENCE 5cp

SURV193 INDUSTRIAL EXPERIENCE 5cp

These subject units are designed to formalise periods of Industrial Experience gained by part-time students only. Students will also be required to present a report giving a connected account and critical evaluation of their engineering activities and experience during the year. Such subjects may be counted by part-time students as electives.

SURV213 SURVEYING 3 10cp

Precise levelling, barometric levelling, trigonometric levelling, reciprocal levelling. Plane triangulation with single-second theodolites. This subject includes a five-day survey camp.

SURV214 OPTICS AND MINING SURVEYING 5cp


SURV215 ELECTRONIC DISTANCE MEASUREMENT 5cp

Principles and applications of electronic distance meters. Propagation of electromagnetic waves, refractive index and conductivity, calculation of velocity and geometric corrections to EDM distances. Reflectors and batteries. Errors and calibration of electronic distance meters.

SURV233 SURVEY COMPUTATIONS 2 5cp


SURV316 HYDROGRAPHIC SURVEYING 5cp


Text


SURV334 ERROR THEORY 5cp

Revision and extension of error theory. Adjustment by least squares. Error ellipse calculations.

Text

SURV361 PHOTOGRAMMETRY II
10cp
Stereoscopic vision — geometry of single aerial photograph — stereoscopic pairs — fundamental mathematical relationships — radial triangulation. Inner, relative and absolute orientation with respect to direct optical projection. Cameras, physical properties of photographs.

Text

SURV362 REMOTE SENSING
5cp
Introduction to sensing and sensors; sensor platforms; ground-based, aerial and satellite; applications.

Text

SURV393 LAND BOUNDARY DEFINITION
10cp
Cadastral surveys in N.S.W. Surveying Law. Torres and Common law titles surveys and searches. Identification surveys. Field records and plans. A ten-day survey camp is a compulsory part of this subject.

Texts
Hallinan, F. 1973, Legal Aspects of Boundary Surveying as Apply in NSW, Inst. of Surveyors NSW.

SURV417 INDUSTRIAL AND OTHER SURVEYING
10cp
Review of statistics. Mechanical principles of instrument design, optical tooling in industry, pointing accuracy theory. Management of a survey practice including use of software systems.

Texts

SURV418 CONTROL NETWORKS
5cp
Analysis of field procedures and design of surveys. Survey control for construction projects, deformation surveys, integrated surveys.

Texts
Hornby, D. 1976, Appraisal One, Jolyon.
## SCHEDULE OF SUBJECTS

### About This Section
This section contains the details of the subjects offered by the departments of the Faculty of Engineering together with subjects offered by departments of other faculties which are included in the course programs set out in Sections 5 and 7. The content descriptions of the listed subjects are set out in Section 6.

### Guide to Subject Detail Schedule

#### Subject Codes
Each subject has been given a unique code (eg CHEE11). This code identifies the subject within the University’s computer system and should be entered on each form dealing with subjects. The alpha section of the code indicates the department responsible for offering the subject. The first number in the code indicates the level at which the subject is offered (i.e. 100, 200, 300, 400 etc.) and, in the Faculty of Engineering, also indicates the WAM weighting of the subject. The latter two numbers usually indicate the sequence of a subject in a stream of subjects or within a course.

The departmental indicators included in this Handbook are set out in the following pages.

The head of the department offering a subject may waive the prerequisite or corequisite requirements of a subject offered by that department. Students should obtain any such waiver in writing on the form available from the Faculty Office and submit the completed form attached to any request for variation of program.

### Prerequisites and Corequisites

Many subjects have prerequisite and/or corequisite requirements. The meaning of these terms are defined in the Award Rules. The prerequisite and corequisite requirements of the subjects described in this Handbook are set out in the following pages.

#### Assumed Knowledge

Many subjects also have assumed knowledge requirements. These are also set out in the following pages. Students are strongly advised to have completed the subjects prescribed as assumed knowledge before enrolling or to otherwise discuss the extent of their disadvantage with the head of department or the lecturer concerned.

### SCHEDULE OF SUBJECTS

#### Subjects Offered by the Department of Chemical Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject Name</th>
<th>Credit Point Value</th>
<th>Semester Available</th>
<th>Prerequisites</th>
<th>Corequisites (CR)</th>
<th>Assumed Knowledge (AK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEE11</td>
<td>Industrial Process Principles</td>
<td>5 1</td>
<td></td>
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<tr>
<td>CHEE12</td>
<td>Introduction to Chemical Engineering</td>
<td>10 2</td>
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</tr>
<tr>
<td>CHEE13</td>
<td>Chemical and Manufacturing Processes</td>
<td>10 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEE191</td>
<td>Industrial Experience</td>
<td>5 Full year</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CHEE192</td>
<td>Industrial Experience</td>
<td>5 Full year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEE193</td>
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<tr>
<td>CHEE194</td>
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<tr>
<td>CHEE241</td>
<td>Design Principles</td>
<td>10 1</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**CHEE242** Chemical Engineering Computations  
**CHEE263** Transfer Principles  
**CHEE264** Transfer Principles  
**CHEE281** Laboratory 1  
**CHEE283** Laboratory 2  
**CHEE300** Selected Topic  
**CHEE321** Modelling of Processes  
**CHEE332** Thermodynamics  
**CHEE341** Project Engineering  
**CHEE342** Safety and Environment  
**CHEE351** Electrochemistry and Corrosion  
**CHEE352** Transport Phenomena  
**CHEE353** Surface Chemistry 1  
**CHEE354** Biotechnology  
**CHEE355** Process Synthesis  
**CHEE356** Fuel Technology 1  
**CHEE357** Process Metallurgy 1  
**CHEE358** Introduction to Mineral Processing  
**CHEE366** Waste Management  
**CHEE367** Analysis of Pollution  
**CHEE372** Separation Processes  
**CHEE381** Engineering Application Laboratory  
**CHEE382** Laboratory 3  
**CHEE383** Laboratory 4  
**CHEE401** Special Topic  
**CHEE405** Process Control and Instrumentation  
**CHEE412** Kinetics and Reaction Engineering  
**CHEE451** Surface Chemistry 2  
**CHEE452** Mineral Processing 2  
**CHEE453** Process Optimization  
**CHEE454** Fuel Technology 2  
**CHEE455** Heat Transfer  
**CHEE456** Process Metallurgy 2  
**CHEE461** Seminar  
**CHEE495** Design Project  
**CHEE496** Advanced Design Project  
**CHEE497** Research Project  
**CHEE498** Advanced Research Project  
**CHEE511** Coal Combustion  
**CHEE512** Coal Technology  
**CHEE513** Furnace Technology  
**CHEE521** Coal Combustion  
**CHEE523** Furnace Technology  
**CHEE542** Power Engineering Processes and the Environment  
**CHEE594** Industrial Systems Project/Seminar A  
**CHEE595** Industrial Systems Project/Seminar B  

**T.B.D.** To be determined  
**H.O.D.** = Head of Department

* 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.
## SECTION NINE

CIVIL ENGINEERING AND SURVEYING SCHEDULE OF SUBJECTS

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject Name</th>
<th>Credit Point Value</th>
<th>Semester Available</th>
<th>Prerequisites</th>
<th>Corequisites (CR): Assumed Knowledge (AK):</th>
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<tbody>
<tr>
<td>CIVL111</td>
<td>Mechanics and Structures</td>
<td>5</td>
<td>Both 1 and 2</td>
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<td>CIVL131</td>
<td>Fluid Mechanics 1</td>
<td>5</td>
<td>2</td>
<td></td>
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<tr>
<td>CIVL141</td>
<td>Environmental Engineering 1</td>
<td>5</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIVL191</td>
<td>Industrial Experience</td>
<td>5</td>
<td>Full year</td>
<td>Part-time Enrolment</td>
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</tr>
<tr>
<td>CIVL192</td>
<td>Industrial Experience</td>
<td>5</td>
<td>Full year</td>
<td>Part-time Enrolment</td>
<td></td>
</tr>
<tr>
<td>CIVL193</td>
<td>Industrial Experience</td>
<td>5</td>
<td>Full year</td>
<td>Part-time Enrolment</td>
<td></td>
</tr>
<tr>
<td>CIVL212</td>
<td>Mechanics of Solids</td>
<td>5</td>
<td>CIVL111</td>
<td>AK: MATH102 or MATH112</td>
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</tr>
<tr>
<td>CIVL213</td>
<td>Theory of Structures 1</td>
<td>5</td>
<td>2</td>
<td>CIVL111</td>
<td>AK: MATH102 or MATH112</td>
</tr>
<tr>
<td>CIVL222</td>
<td>Materials 2</td>
<td>5</td>
<td>1</td>
<td></td>
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<tr>
<td>CIVL223</td>
<td>Materials 3</td>
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<td>2</td>
<td>CIVL222</td>
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<td>CIVL224</td>
<td>Geotechnical Investigation</td>
<td>10</td>
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<tr>
<td>CIVL232</td>
<td>Fluid Mechanics 2</td>
<td>5</td>
<td>1</td>
<td>CIVL131</td>
<td>AK: MATH102 or MATH112</td>
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<tr>
<td>CIVL233</td>
<td>Fluid Mechanics 3</td>
<td>5</td>
<td>2</td>
<td>CIVL131</td>
<td>AK: CIVL232</td>
</tr>
<tr>
<td>CIVL242</td>
<td>Environmental Engineering 2</td>
<td>5</td>
<td>2</td>
<td>CIVL141</td>
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<tr>
<td>CIVL251</td>
<td>Systems</td>
<td>5</td>
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<tr>
<td>CIVL271</td>
<td>Transportation Engineering</td>
<td>10</td>
<td>Full year</td>
<td></td>
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<tr>
<td>CIVL314</td>
<td>Theory of Structures 2</td>
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<td>1</td>
<td>CIVL213</td>
<td>AK: CIVL212</td>
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<tr>
<td>CIVL315</td>
<td>Stress Analysis</td>
<td>5</td>
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<td>CIVL212</td>
<td>AK: CIVL213</td>
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<td>CIVL316</td>
<td>Reinforced Concrete Design</td>
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<td>2</td>
<td>CIVL212</td>
<td>AK: CIVL213</td>
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<tr>
<td>CIVL317</td>
<td>Soil Design</td>
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<td>1</td>
<td>CIVL212</td>
<td>AK: CIVL213</td>
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<tr>
<td>CIVL325</td>
<td>Soil Mechanics 1</td>
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<td>CIVL212, CIVL24</td>
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<td>CIVL326</td>
<td>Soil Mechanics 2</td>
<td>5</td>
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<td>CIVL235</td>
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<tr>
<td>CIVL327</td>
<td>Concrete and Masonry Technology</td>
<td>5</td>
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<td>CIVL232</td>
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<tr>
<td>CIVL329</td>
<td>Concrete and Masonry Technology</td>
<td>5</td>
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<td>CIVL232</td>
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<tr>
<td>CIVL332</td>
<td>Open Channel Hydraulics</td>
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<td>CIVL342</td>
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<td>CIVL232, CIVL38</td>
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<td>CIVL352</td>
<td>Management</td>
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<tr>
<td>CIVL353</td>
<td>Environmental Regulations</td>
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<tr>
<td>CIVL381</td>
<td>Statistical Methods</td>
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<td>CIVL410</td>
<td>Dynamics and Stability of Structures</td>
<td>5</td>
<td>2</td>
<td>MCHI205</td>
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<td>CIVL418</td>
<td>Theory of Structures 3</td>
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<td>1</td>
<td>MCHI205</td>
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<td>CIVL419</td>
<td>Masonry and Timber Design</td>
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<td>CIVL420</td>
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<td>CIVL429</td>
<td>Rock Mechanics</td>
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<td>CIVL435</td>
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<td>CIVL463</td>
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<td>CIVL465</td>
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<td>CIVL351, CIVL342</td>
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<td>CIVL474</td>
<td>Civil Engineering Design 2</td>
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<td>CIVL475</td>
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<td>Not until 1994</td>
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<tr>
<td>CIVL487</td>
<td>Engineering Risk Assessment</td>
<td>5</td>
<td>2</td>
<td>CIVL381 or STAT205</td>
<td>AK: All Year III subjects</td>
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<td>CIVL491</td>
<td>Special Topic</td>
<td>5</td>
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<td>Permission of H.O.D.</td>
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<td>CIVL492</td>
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<td>Permission of H.O.D.</td>
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<td>SURV111</td>
<td>Surveying 1</td>
<td>10</td>
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<td>Surveying 2</td>
<td>10</td>
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<tr>
<td>SURV191</td>
<td>Industrial Experience</td>
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<td>Full year</td>
<td>Part-time Enrolment</td>
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<tr>
<td>SURV192</td>
<td>Industrial Experience</td>
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<td>Full year</td>
<td>Part-time Enrolment</td>
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<tr>
<td>SURV193</td>
<td>Industrial Experience</td>
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<td>Part-time Enrolment</td>
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<td>SURV213</td>
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<td>10</td>
<td>2</td>
<td>SURV111, SURV112</td>
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<tr>
<td>SURV214</td>
<td>Optics and Measuring Survey</td>
<td>5</td>
<td>1</td>
<td>SURV111, SURV112</td>
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<tr>
<td>SURV215</td>
<td>Electronic Distance Measurement</td>
<td>5</td>
<td>2</td>
<td>SURV111, SURV112</td>
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<tr>
<td>SURV233</td>
<td>Survey Computations</td>
<td>5</td>
<td>2</td>
<td>SURV111, SURV112</td>
<td>AK: MCHI202</td>
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<tr>
<td>SURV316</td>
<td>Hydrographic Surveying</td>
<td>5</td>
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<td>SURV111, SURV112</td>
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</tbody>
</table>

**H.O.O. = Head of Department**

* 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.
### COMPUTER SCIENCE SCHEDULE OF SUBJECTS

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject Name</th>
<th>Credit Points</th>
<th>Semester Available</th>
<th>Prerequisites</th>
<th>Corequisites (CR)</th>
<th>Assumed Knowledge (AK)</th>
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<tbody>
<tr>
<td>COMP101</td>
<td>Computer Science 1</td>
<td>20</td>
<td>Full Year</td>
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<tr>
<td>COMP201</td>
<td>Advanced Data Structures</td>
<td>3</td>
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<td>COMP101 or COMP212</td>
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<tr>
<td>COMP202</td>
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** 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.
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T.B.D. = To be determined

H.O.D. = Head of Department

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

† Students intending to enrol in MECH415 who completed MECH213 prior to 1989 or who were granted credit in that subject or in MECH211 should consult the Head of Department regarding bridging work in CAD to be undertaken in February and completed prior to commencement of classes in MECH211.

### Schedule of Selected Subjects Offered by Departments Outside the Faculty of Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject Name</th>
<th>Credit Point Value</th>
<th>Semester Available</th>
<th>Prerequisites</th>
<th>Corequisites (CR)</th>
<th>Assumed Knowledge (AK)</th>
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<td>Cell Biology, Genetics and Evolution</td>
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