The University of Newcastle

FACULTY OF ENGINEERING
HANDBOOK
The University of Newcastle Calendar consists of the following volumes:

Volume 1 — Legislation
Volume 2 — University Bodies and Staff
Volume 3 — Faculty of Architecture Handbook
Volume 4 — Faculty of Arts Handbook
Volume 5 — Faculty of Economics and Commerce Handbook
Volume 6 — Faculty of Education Handbook
Volume 7 — Faculty of Engineering Handbook
Volume 8 — Faculty of Medicine Handbook
Volume 9 — Faculty of Science and Mathematics Handbook
Volume 11 — Faculty of Music Handbook

Also available are the Undergraduate Guide and Postgraduate Prospectus.

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

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

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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 or in 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 in Computer Science and Surveying, will, in their own way, contribute to the solution of these and other important problems.

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.

The opportunity to obtain a well-rounded tertiary educational experience is embodied in the very concept of the university system. The University environment, with its excellent campus and facilities, together with the many extra-curricula activities, creates an opportunity for obtaining a broad experience, indeed

a unique experience in one's lifetime. For this reason I would encourage you to take full advantage of the opportunities available to you and, where time permits, take an active interest in the various facets of University life. I would also encourage you to take part in the decision-making processes of the Faculty, either through membership of the Faculty and Departmental Boards, or by supporting the students elected to those positions.

The staff of the Faculty will do everything possible to make your work both interesting and enjoyable; they are anxious to help you with any problems you may have. We would be most grateful for any feedback of a constructive nature that you may wish to offer.

In conclusion, I wish you well in your studies at this University. There is no doubt that a course leading to a degree in Engineering, Computer Science or Surveying, requires a great deal of dedication and perseverance, but the task is certainly a rewarding one.

ALAN W. ROBERTS
Dean
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Students with Special Needs

Students with disabilities may wish to consult the Faculty's Advisor for Students with Special Needs, Dr D.H. Wood of the Department of Mechanical Engineering.

THE FACULTY

The Faculty of Engineering is constituted by the Council of the University under By-law 2.4.1 and consists of the Department of Chemical Engineering, the Department of Civil Engineering and Surveying, the Department of Electrical Engineering and Computer Science 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 and Architecture, 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.

The responsibilities of Faculty Boards are set out in By-law 2.4.4 and other By-laws and Regulations of the University.

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 is awarded in the specialties of:
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Mechanical Engineering
- Electrical Engineering
- Industrial Engineering
- and Mechanical Engineering
- Bachelor of Surveying (BSurv)

Postgraduate Diplomas

Diploma in Computer Science (DipCompSc)
Diploma in Computing (DipComp)
Diploma in Surveying (DipSurv)

Higher Degrees

Master of Computer Science (MCompSc)
Master of Computing (MComp)
Master of Engineering Science (MEngSc)
Master of Engineering (MEng)
Master of Science (MSc)
Doctor of Engineering (DEng)
Doctor of Philosophy (PhD)
Doctor of Science (DSc)

* Note: No further enrolments are being accepted to the MEngSc programme

Bachelor Degree Courses

General information regarding the bachelor degree programmes offered in the Faculty is provided below. The detailed Course Programmes appear in Section 5 of the 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 programme meets the highest academic requirements for membership of the Australian Computer Society (ACS). The BCompSc programme may be completed by three years of full-time study or part-time equivalent. Combined degree programmes are also available which allow the BCompSc degree to be completed together with a degree in either Arts, Computer Engineering or Mathematics.

Honours in Computer Science

The Bachelor of Computer Science (Honours) degree is a separate degree programme which may be taken full-time over one year or part-time over two years. Candidates for this degree have normally completed the BCompSc programme 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 specialties:
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Industrial Engineering
- Mechanical Engineering

Each engineering degree programme 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 as their commitments permit. It is also possible to follow a 'thick sandwich' pattern of attendance by which full-time study and full-time industrial experience are alternately undertaken on an annual basis. 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 1 students study mathematics and the basic sciences as well as commencing studies in the engineering sciences. Year II programmes continue studies in mathematics and, where applicable, basic sciences. The scope of engineering studies is extended by the inclusion of more highly specialised topics. The programmes also make provision for non-engineering elective subjects to be included in the degree programme. The final year project, in which students may undertake extensive studies in an area of special interest, is a particular feature of engineering programmes at Newcastle.

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

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

Honours

Awards of honours are made on the basis of performance during the entire course programme (see Faculty Policies in Section 4).

Accreditation

Each engineering programme is recognised as meeting the full academic requirements for corporate membership of the Institution of Engineers, Australia (IEAust) and recognised by a number of overseas professional bodies.

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

The Chemical Engineering programme also meets requirements for membership of the Institution of Chemical Engineers (Great Britain) and is recognised by the Royal Australian Chemical Institute and the Australian Institute of Energy.

Combined Degree Programmes

Each of the BE programmes may form part of a combined degree programme leading to the award of a second degree by, in most cases, a total of five years of full-time study. Programmes have been approved which lead to the award of the BE degree in any speciality together with Bachelor degrees in Arts (BA), Commerce (BCom), Economics (B Econ), Mathematics (BMath) or Science (BSc). In addition, two specialist combined degree programmes have also been established: BE (Computer Engineering)/BCompSc and BE (Civil Engineering)/BSurv.

Combined degree programmes are normally entered after completion of the first year of the relevant engineering programme with an average of credit or weighted average mark (WAM) of 55.

In the case of the BE (Computer Engineering)/BCompSc and BE (Civil Engineering)/BSurv programmes, a WAM of 55 is required after completion of the first year of either of the associated programmes.

Surveying

The Bachelor of Surveying (BSurv) programme is offered as a four year full-time or equivalent study course on a similar basis to that of engineering programmes. In addition to Mathematics and Physics, the course also deals with aspects of Civil Engineering, Economics and Law as well as the technical aspects which include: cadastral surveying, engineering surveying, topographical surveying, geodetic and hydrographic 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. Enquiries 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)/BSurv degree programme, a recent innovation understood to be unique to the University of Newcastle, allows completion of the two professional qualifications in 5 years of full-time study. The programme is entered after completion of the first year of either course with a WAM of 55 or more.

Postgraduate Diploma Courses

Diploma in Computer Science

The Postgraduate Diploma in Computer Science meets the highest academic requirements for membership of the Australian Computer Society (ACS).

Applicants for admission to the programme must demonstrate a sound knowledge of Pascal. This knowledge can be demonstrated either by passing the Introduction to Programming Exemption Examination or by providing evidence of successful completion of an appropriate higher degree course in computer science.

Surveying

The Diploma in Surveying is a postgraduate course designed to broaden and further the education of the practising surveyor. 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 twenty years ago. In the course has a double objective. Primarily, it has been designed as a bridging course for surveyors with the professional qualification of the Reciprocal Surveyors Boards of Australia and New Zealand. University degree courses in surveying were not available when these surveyors passed the examinations set by those Boards.

The Diploma in Surveying is seen as broadening and updating the professional training with a choice of subjects designed to complement the professional experiences of candidates. Postgraduate surveyors who already have had a comprehensive training in the modern developments in surveying, the course has a secondary objective. 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 programme is normally completed by at least two years of part-time study, although in special cases approved by the Faculty Board, the programme may be completed in one year on a full-time basis.

Higher Degree Programmes

Master of Computer Science

The MCompSc is a research degree by thesis, requiring an original contribution to knowledge in the area of computer science. Applicants for admission are expected to hold a BCompSc (Honours) or an equivalent honours degree with at least second class honours. Candidates who enrol initially in the MCompSc may later transfer into the PhD programme if their work is of an exceptional quality. The area of research is usually associated with one of the research projects being carried out in the Department of Electrical Engineering and Computer Science.

Master of Surveying

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

This postgraduate coursework masters degree programme 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 Electrical Engineering and Computer Science.

Applications will be considered from graduates who have completed the Bachelor of Computer Science or its equivalent (eg. including the Diploma in Computer Science).
Centre for Industrial Control Science

The Centre for Industrial Control Science was established in the Department of Electrical Engineering and Computer Science in 1988 under the Special Research Centre scheme of the Australian Government. 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 understanding 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 Engineering and Computer Science 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
Dept of Electrical Engineering and Computer Science
University of Newcastle
AUSTRALIA 2308.

The School of Engineering and Architecture

The School of Engineering and Architecture was established on 1 January 1989 as a funding unit within the University. The School comprises the Faculty of Engineering and the Faculty of Architecture. The Foundation Director of the School is Professor A.W. Roberts.

Bachelor Degree Regulations

About This Section

This section contains the University Regulations regarding the Bachelor Degrees offered in the Faculty of Engineering.

Regulations Governing Bachelor Degrees in the Faculty of Engineering

1. General

These Regulations are made in accordance with the powers vested in the Council under By-law 5.2.1 and prescribe the conditions and requirements relating to the degrees of Bachelor of Computer Science, Bachelor of Computer Science (Honours), Bachelor of Engineering and Bachelor of Surveying.

2. Definitions

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

'candidate' means a student enrolled in a course;

'course' means the total requirements of the programme approved by the Faculty Board in accordance with the Schedule to qualify a candidate for the award of the degree;

'course programme' means the programme of subjects approved by the Faculty Board in accordance with the Schedule;

'Course Coordinator' means the Head of the designated Department or that Head of Department's nominee;

'Dean' means the Dean of the Faculty and, for the purposes of these Regulations, also means any nominee of the Dean;

'degree' means the Bachelor Degree referred to in the relevant schedule;

'Department' means the department or departments offering a particular subject and includes any other body doing so;

'Faculty' means the Faculty of Engineering;

'Faculty Board' means the Faculty Board, Faculty of Engineering;

'designated Department' means the department identified as such in the Schedule;

'Schedule' means the schedule to these Regulations relevant to the course in which a person is enrolled or proposing to enrol;

'satisfactory result' means a result considered by the Faculty Board to be sufficient to satisfy pre-requisite requirements;

'semester' means that portion of the calendar year so designated by the University; and

'subject' means a discrete component of a course for which a result may be recorded.

(2) The credit point value of a subject counting towards completion of the requirements of a course shall:

a) in the case of subjects offered by Departments comprising the Faculty of Engineering or by Departments outside the Faculty of Engineering specifically for inclusion in courses offered in the Faculty of Engineering, be the credit point value determined by the Faculty Board;
41. The Faculty Board, on the recommendation of the Course Coordinator, may grant exemption from undertaking subjects comprising a course in recognition of work completed in this University or another institution.

42. Exemptions shall be deemed to meet prerequisite, co-requisite and assumed knowledge requirements but apply only to the particular course in which the candidate is enrolled and are subject to review on any subsequent change of course by the candidate.

43. Exemptions granted for work completed for which an award has previously been made in this University or for work completed at another institution, whether an award has been made or not, shall not exceed:

a) in the case of the Bachelor of Computer Science course, 48 credit points; and
b) in the case of the Bachelor of Engineering and Bachelor of Surveying courses, 96 credit points.

44. Exemptions will not be granted in the Bachelor of Computer Science (Honours) course.

5. Enrolment: Standard Programme

1.41. The subjects comprising the course programme approved by the Faculty Board in accordance with the requirements of a Schedule shall be grouped by Year. Each Year of the course programme shall total 45 credit points and specify the annual programme of subjects to be undertaken by a full-time student completing the course in minimum time.

2. A candidate who has fully completed the requirements of the subjects comprising a particular Year of a course programme may enrol in any combination of subjects scheduled in the next Year of that course programme provided that the prerequisite, co-requisite requirements and assumed knowledge requirements of those subjects are met.

6. Enrolment: Non-Standard Programme

1. For the purposes of this regulation, a non-standard programme is defined as a combination of subjects which count in more than one Year of a course programme.

2. A candidate applying for enrolment in a non-standard programme shall comply with the rules for non-standard enrolment determined from time to time by the Faculty Board.

7. Prerequisites, Co-requisites and Assumed Knowledge

1. The Faculty Board on the recommendation of a Head of Department may prescribe prerequisites, co-requisites and assumed knowledge requirements for any subject offered by that Department.

2. Except with the approval of the Dean granted on the written recommendation of the Head of the Department offering the subject concerned, a candidate shall not enrol in a subject unless that candidate has:

a) attained a satisfactory result in any subject prescribed as its prerequisite;

b) attained a satisfactory result in any subject prescribed as its co-requisite or concurrently enrolled in any such subject; and

c) attained a satisfactory result on or as the basis of knowledge reasonably satisfied to the Faculty Board, in any subject prescribed as assumed knowledge.

3. A candidate enrolled in a subject in contravention of a prerequisite, co-requisite or assumed knowledge requirements may be withdrawn without notice from the subject unless permitted by the Head of Department to remain enrolled.

4. Except upon payment of the administration charge prescribed from time to time by the University Secretary and with the approval of the Dean given only on the written recommendation of the Head of Department, a candidate may not enrol in a subject unless application to do so is made:

a) in the case of any subject offered in the first semester or over a full year, the Friday of the third week of second semester;

b) in the case of any subject offered in the second semester, the Monday of the third week of second semester.

5. A candidate who applies to withdraw from any subject which is a prerequisite, co-requisite or assumed knowledge requirement for any other subject may be withdrawn without notice from any subject for which the withdrawn subject is prescribed unless permitted by the Head of Department to remain enrolled.

6. Any material presented by a candidate for assessment purposes of admission to the specific combined degree programme shall be work of the candidate and not previously submitted or written or other work as the Department shall require.

7. Any material presented by a candidate for assessment purposes shall be work of the candidate and not previously submitted for assessment elsewhere except as otherwise permitted by the Head of Department.

8. Subject Requirements

1. A candidate enrolled in a subject shall attend such lectures, tutorials, seminars, laboratory classes and field work as may be assigned to the subject.

2. A candidate enrolled in a subject shall satisfy the requirements for assessment and examinations as the Department shall require.

9. Examination - Including Withdrawal

1. A candidate may apply to withdraw from a subject or course only by informing the Secretary to the University on or before the last date for withdrawal, if approved, shall take effect from the date of receipt of such an application.

2. An application to withdraw from a subject but not from the course, will not be approved unless the application is received before the relevant last date for withdrawal, except that the Dean may approve withdrawal without academic penalty in appropriately documented exceptional circumstances.

3. A candidate who withdraws from the course shall be deemed to have failed in any uncompleted subject in which they are enrolled unless the application to withdraw is received before the last date for withdrawal relevant to such a subject, except that the Dean may approve withdrawal without academic penalty in appropriately documented exceptional circumstances.

The last date for withdrawal shall be:

a) in the case of any subject offered in the first semester, the Monday of the ninth week of first semester;

b) in the case of any subject offered in the second semester, the Monday of the ninth week of second semester; and

c) in the case of any subject offered over a full year, the Monday of the third week of second semester.

10. Re-admission

1. An applicant for re-admission to a course shall satisfy the requirements of the Regulations Governing Admission and Enrolment and such other additional requirements as may be specified in the Schedule.

2. Except as provided below, a candidate who does not re-enter in a course in each Year shall be deemed to have failed in all courses in that Year.

3. Candidates for the degrees of Bachelor of Computer Science, Bachelor of Engineering and Bachelor of Surveying who properly apply for re-admission to a course not more than one year following the relevant last date for enrolment in that course shall be deemed to have been granted leave of absence for that year and shall be re-admitted to that course and permitted to proceed as if they had continuously maintained their enrolment, provided that the candidate:

a) had completed at least one subject in the year of last enrolment in that course; and

b) was eligible to re-enrol at the conclusion of the last year of enrolment in that course.

4. Annual periods of leave permitted under Regulation 10(3) may be taken more than once.

5.1. The degree may be conferred in the following areas of specialisation:

- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Industrial Engineering
- Mechanical Engineering
SECTION THREE

2. For the purposes of these Regulations the designated Department with respect to each area of specialisation shall be:

- Department of Chemical Engineering
  - Chemical Engineering
- Department of Civil Engineering and Surveying
  - Civil Engineering
- Department of Electrical Engineering and Computer Science
  - Computer Engineering and
  - Electrical Engineering
- Department of Mechanical Engineering
  - Industrial Engineering and
  - Mechanical Engineering

3. To qualify for admission to the degree in any area of specialisation a candidate shall:

a) complete to the satisfaction of the Faculty Board a programme of subjects approved by the Faculty Board on the recommendation of the Head of the designated Department totalling 192 credit points or such greater number of credit points as may be approved by Faculty Board in individual cases;

b) satisfy the industrial experience requirements prescribed by the Faculty Board.

4. The course programme of 192 credit points approved by the Faculty Board shall include as a minimum:

- 48 credit points taken at 100 level
- 36 credit points taken at 200 level
- 36 credit points taken at 300 level
- 24 credit points taken at 400 level

5. A person who has satisfied the requirements for admission to the degree in one area of specialisation may be admitted to candidature in any other area of specialisation on such conditions as the Faculty Board may prescribe. Upon completing the requirements for admission to the degree in that other area of specialisation the candidate shall be eligible to receive a certificate to that effect.

6. The degree shall be conferred as an ordinary degree except that, in cases where a candidate's performance in the course has reached a standard determined by the Faculty Board to be of sufficient merit, the degree may be conferred with honours.

Schedule 2 — Bachelor of Metallurgy
(Discontinued)

Schedule 3 — Bachelor of Surveying
1. The designated Department for the purposes of these regulations shall be the Department of Civil Engineering and Surveying.

2. To qualify for admission to the degree a candidate shall complete to the satisfaction of the Faculty Board a programme of subjects approved by the Faculty Board on the recommendation of the Head of the designated Department totalling 192 credit points or such greater number of credit points as may be approved by Faculty Board in individual cases.

3. The course programme of 192 credit points approved by the Faculty Board shall include as a minimum:

- 48 credit points taken at 100 level
- 36 credit points taken at 200 level
- 36 credit points taken at 300 level
- 24 credit points taken at 400 level

4. The degree shall be conferred as an ordinary degree except that, in cases where a candidate's performance in the course has reached a standard determined by the Faculty Board to be of sufficient merit, the degree may be conferred with honours.

Schedule 4 — Bachelor of Science (Engineering)
(Discontinued)

Schedule 5 — Bachelor of Science (Metallurgy)
(Discontinued)

Schedule 6 — Bachelor of Computer Science
1. The designated Department for the purposes of these regulations shall be the Department of Electrical Engineering and Computer Science.

2. To qualify for admission to the degree a candidate shall complete to the satisfaction of the Faculty Board a programme of subjects approved by the Faculty Board on the recommendation of the Head of the designated Department totalling 144 credit points or such greater number of credit points as may be approved by the Faculty Board in individual cases.

3. The course programme of 144 credit points approved by the Faculty Board shall include as a minimum:

- 48 credit points taken at 100 level
- 36 credit points taken at 200 level
- 24 credit points taken at 300 level

4. The degree shall be conferred only as an ordinary degree.

Schedule 7 — Bachelor of Computer Science
(Honours)
1. The designated Department for the purposes of these regulations shall be the Department of Electrical Engineering and Computer Science.

2. In order to be admitted to candidature for the degree, an applicant shall:

a) have completed requirements for admission to the ordinary degree of Bachelor of Computer Science in the University of Newcastle or to any other degree approved by the Faculty Board;

b) have satisfactorily completed any additional work prescribed by the Head of the designated Department;

c) have obtained approval to enrol given by the Dean on the recommendation of the Head of the designated Department who, after considering the previous academic performance of the applicant in relevant studies, may decline to recommend an applicant for candidature.

3. Candidature for the degree shall not extend beyond two calendar years, except that in exceptional circumstances arising in a particular case the Faculty Board may grant permission to extend the term of candidature on such conditions as it considers appropriate including requiring additional subjects to be taken towards the degree.

4. To qualify for admission to the degree a candidate shall complete a programme of subjects approved by the Faculty Board on the recommendation of the Head of the designated Department totalling 48 credit points or such greater number of credit points as may be approved by the Faculty Board in individual cases.

5. The Faculty Board shall, on the recommendation of the Head of the designated Department, determine the award of honours to be made to a candidate upon completion of the requirements of this Schedule.
FACULTY POLICIES

About this Section
This section contains Faculty Policies which are relevant to all students enrolled in undergraduate programmes within the Faculty and are to be read in conjunction with course programmes and degree regulations.

Students should note that Faculty Policies do not remain static. Students are to consult the relevant Faculty 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 Secretary.

General Course Rules and Information
The information given below should be read in conjunction with the Regulations Governing Bachelor Degrees in the Faculty of Engineering and other University requirements and Faculty policies.

It is the responsibility of students to ensure that they enrol in a programme 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 Programme Form and attached to that form.

Advice on course requirements and procedures is available from the staff of the School Office - Enquiries to Room BA206, telephone (049)685630 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 48 credit points may be taken to indicate that the total workload of an average student working at past level is approximately 48 hours per week. Thus a 3 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 subject.

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 programmes 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 programmes.

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

6. Students must satisfy the relevant pre-requisite, co-requisite and assumed knowledge requirements of each subject unless granted a written waiver of such requirements by the Head of the Department offering the subject. Students wishing to obtain such a waiver should make application at the scheduled deadline.

7. Second semester timetable requirements may restrict selection of subjects in non-standard programmes. If a student requests a variation of enrolment at another time, the relevant form should be obtained from the School Office before making an appointment to see the Head of Department to discuss the proposed waiver.

8. Only in exceptional circumstances will pre-requisite, co-requisite and assumed knowledge 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 pre-requisite, co-requisite or assumed knowledge requirements is contingent upon successful completion of the relevant first semester subjects.

10. It is the responsibility of students to apply to withdraw from any second semester subject for which they do not meet pre-requisite, co-requisite 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.

11. A student who remains 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 Absent Fail (AF).

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:

- 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 any other relevant factors.

Non-Standard Programmes
14. A non-standard programme is one which includes subjects from more than one Year of the course programme. Where 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 programme.

15. Students are expected to complete subjects in the order given in the course programme. A student undertaking a non-standard programme should therefore include all uncompleted subjects 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.

16. Applications for enrolment in the following non-standard programmes will be approved without special permission being required.

- An annual programme of subjects prescribed for a combined degree programme in which a student is enrolled.

- Inclusion of Industrial Experience subjects by part-time students.

- An annual programme which follows prescribed Year by Year transition arrangements.

- An annual programme of subjects for which all of the following apply:

  - all pre-requisite, co-requisite and assumed knowledge requirements are met or written relaxation of the relevant requirements is submitted;

  - subjects extend over only two Years of the course;

  - all uncompleted subjects in the lower Year of the course programme are included.
**SECTION FOUR**

**FACULTY POLICIES**

- when undertaken by a student with a WAM of 55 or more, has a total credit point value not exceeding 51 with no more than 30 credit points in either semester; and
- when undertaken by a student with a WAM of 54 or less, has a total credit point value not exceeding 36 with no more than 24 credit points in either semester.

20. All other applications for enrolment must be approved by the Course Coordinator responsible for the course in which the student is enrolled.

21. Discussions with the Course Coordinator normally take place at the scheduled Re-enrolment Approval Sessions held in February each year. At other times, an appointment should be made at the Office of the Department concerned.

Substitution of Subjects
22. The Head of Department or Course Coordinator may approve limited substitution of another subject for a subject listed in the course programme where such a substitution is considered to be to the academic benefit of the student concerned. Approval will only be given where:

- the subject is of the same credit point value as the subject(s) it replaces;
- the requirements of the Regulations governing the degree programme continue to be met; and
- the overall programme of study to be taken by the student is suited to the award of the degree involved.

23. Substitution will not be granted for Year 1 subjects.

Enrolment in Extraneous Subjects
24. Enrolment in subjects extraneous to the requirements of the course in which the student is enrolled will normally only be approved where the student is otherwise enrolled in all subjects required to complete degree requirements and has a WAM of at least 55. The total programme attempted by such a student, including extraneous subjects, shall not exceed 48 credit points. The approval of the Dean is required for any application to undertake extraneous or non-degree 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 may charge 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 Programmes**

- Computer Science  
  - Associate Professor G. Wrightson
- Electrical Engineering  
  - Associate Professor P.J. Moylan
- Industrial Engineering  
  - Mr G.D. Butler
- Mechanical Engineering  
  - Mr J.W. Hayes
- Surveying  
  - Associate Professor J.G. Fryer

**Postgraduate Coursework Programmes**

- Computer Science  
  - Associate Professor G. Wrightson
- Surveying  
  - Associate Professor J.G. Fryer

**Undergraduate Performance and Progress**

These policies, known as the 'WAM Rules', were amended with effect from 1990 and now apply to students enrolled in the Bachelor of Computer Science, Bachelor of Engineering and Bachelor of Surveying degree programmes.

1. **General**

   (1) The following policies are made under the powers vested in the Faculty Board, Faculty of Engineering, by the Regulations Governing Bachelor Degrees offered in the Faculty of Engineering and various By-laws and Regulations of the University including, but not limited to, By-law 2.4 - The Faculties, the Examinations Regulations, and the Regulations Governing Un satisfactory Progress.

   (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.
   - "course" 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 the degree of Bachelor of Computer Science, Bachelor of Engineering or Bachelor of Surveying.
   - "Course Coordinator" means Head of the designated Department or the Head of Department's nominee.
   - "Dean" means the Dean of the Faculty of Engineering.
   - "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.
   - "designated department" means the department identified as such in the relevant Schedule of the Degree Regulations.
   - "student" means a person enrolled in an undergraduate course offered in the Faculty of Engineering.
   - "Sub-dean" means a Sub-dean of the Faculty of Engineering.
   - "WAM" means the cumulative Weighted Average Mark calculated in accordance with these policies.

2. **Reservation**

   Faculty Board reserves its right to consider each case on its merits and to amend its policies without notice if it judges to be proper to maintain appropriate standards of attainment.

3. **Assessment**

   (1) Assessment within each subject offered by a Department may take into account work in assignments, reports, laboratory 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 weightings of each task and class marking 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:

   **Result**

   **Reported as**

   Marks in the range of

   45 to 100 inclusive - Percentage Mark

   - Marks less than 45% - FF (Fail)
   - Marks 45% to 54% - DP (Distinction Pass)
   - Marks 55% to 64% - PP (Pass)
   - Marks 65% to 74% - HD (Honours)

   Other non-passing grades - Grades approved by Senate for specific purposes.

   (4) A mark of 50% is considered to be the notional pass/fail level of performance, however it is recognised that no matter how careful the assessment, an area of doubt may exist within 5% of that mark. Therefore, while a mark below 45% 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 not performing clearly at a satisfactory level in the subject concerned, but nevertheless demonstrating sufficient understanding of the subject to proceed, provided other progress requirements are met, without repeating the material contained in that subject (see 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 45 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 measured 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:

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

   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 the range of 45 to 100 inclusive, 'm' is equal to that percentage mark.
   - Where the result in a subject is a grade of FF, AF, EF or WF, '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 as the relevant number listed below:

     - **Grade**
     - **'m'**
     - HD = 93
     - D = 80
     - C = 70
     - P = 58
     - UP = 58
     - TP = 49

   Where grades of W, X, S or L 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.

   **Level at which the subject is offered**

   **Weighting**

   - 100 1
   - 200 2
   - 300 3
   - 400 and over 4

   Note: The level at which a subject is offered is indicated by the first number in the subject code; for example, MEC1H01 is offered at level 100 and MEC1B42 is offered at 300 level.
A student who achieves a WAM of 55 or more is considered to be on probation, the term of their probation shall be deemed to be extended to the following year of enrolment.

6. Unsatisfactory Progress
(1) A student on probation who fails to attain a WAM of 55 or more at the end of their probationary year and failed to achieve an annual WAM of 55 or more in that year, shall be deemed not to have maintained a satisfactory level of progress and shall be required to show cause as to why he or she should not be excluded from the Faculty under the terms of those Regulations.

8. Awards of Honours - Engineering and Surveying
(1) Honours grades in the Bachelor of Engineering and Bachelor of Surveying programmes 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>67</td>
<td>Class II Division 2</td>
</tr>
<tr>
<td>72</td>
<td>Class II Division 1</td>
</tr>
<tr>
<td>77</td>
<td>Class I</td>
</tr>
</tbody>
</table>

(2) If a student was granted exemptions at the time of his or her admission or re-admission to a course offered in the original course, retain the WAM achieved in the original course as the basis for future WAM calculations in the new course.

(3) Elective subjects approved by Faculty Board will normally be awarded at the completion of that subject, or that no honours grade 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, 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 5.2.

(4) 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.

(5) Students may elect to repeat any subject in which they were awarded a result of 55 or is excluded under the provisions of section 5 of these policies.

7. Special Consideration
It is recognised that during the course of their studies, students may suffer from sickness or other serious circumstances beyond their control which affect their preparation for or performance at an examination. University Regulations provide for students who believe that their performance in a subject has been adversely affected by such circumstances to apply for Special Consideration (also refer to the General University Information section of this Handbook).

Applications for Special Consideration MUST be made on the prescribed form. Forms are available from the Student Administration Office in the McMullin Building and the School Office - Room EA206.

As decisions can only be made on the basis of the information presented by the student, all available evidence should accompany each application. The medical certificate given on the prescribed form must be completed where an application is made on medical grounds unless a more extensive medical report is presented which includes the information required on the form. Where a request for Special Consideration is made on the grounds of misadventure, all available supporting evidence should be attached to the application. In some cases, particularly where no written evidence is available, the submission of a statutory declaration will be appropriate. Statutory declaration forms are available from most newsgatherers.

Applications for Special Consideration should be made as soon as possible after the occurrence of the circumstances leading to the request but not more than 3 days after the final examination in a subject. When considering requests for Special Consideration it is the intention of the Faculty to take account of circumstances which adversely affect performance such that the performance of the student concerned does not reflect his or her true competence in a subject. In doing so, the Faculty will be conscious that any Special Consideration given should not act to the disadvantage of other students.

Enquiries regarding Special Consideration may be directed to the Faculty Secretary - Telephone (049)885630.

Further Assessment
A department may grant further assessment where it considers it 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. Further assessments are normally undertaken:

- 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.

In view of the provision for further assessment by departments, the Faculty Board does not normally award results of Incomplete (I), however, it may do so if it deems it appropriate to allow a further short period for further assessment. A student in receipt of a result of Incomplete should immediately contact the Head of the Department offering the subject concerned to arrange a time to do so.
undertake further assessment. All further assessment for full-year or second semester subjects should be completed by the second week of January.

When a student granted further assessment on the basis of a request for Special Consideration is unable to attend for further assessment because of medical or other reasons beyond the control of the student and cannot be granted a non-failing result on the basis of work completed in the subject, the Department may recommend the grade of Not Completed (NC) in recognition that a student was unable to complete a subject for good cause. This result has an effect similar to withdrawal without penalty from the subject and the subject must be repeated.

*At the time of publication final approval for the award of the NC result was awaiting from Senate.*

**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 an I unless the student has been enrolled in a programme which was potentially sufficient to complete degree requirements in first semester. A result of I given in a first semester subject may be reviewed at the conclusion of second semester in the light of results obtained in other subjects in that year and may be amended to 'I' 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 or results consists of a check of records to ensure that all work has been marked and all marks were correctly included in the result - it is not a remark of the work submitted. If considered necessary, students may attach a statement to the official request for a review detailing any facts believed to point to an error or omission having been made. Students may discuss aspects of performance in examinations with the lecturer concerned within a short period after final results have been published in order to gain feedback for educational purposes.

**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) during the November examination period. This date is extended in the same way as a final formal examination. That is, failure to submit the report as or before the due date is regarded 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 Secretary to the University (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) during the January examination period and the Project will 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 Credit Points</th>
<th>Year</th>
<th>Part-time Credit Points</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-48</td>
<td>0-24</td>
<td>1</td>
<td>I</td>
</tr>
<tr>
<td>49-96</td>
<td>1</td>
<td>25-48</td>
<td>2</td>
</tr>
<tr>
<td>97-144</td>
<td>3</td>
<td>49-72</td>
<td>3</td>
</tr>
<tr>
<td>144-192</td>
<td>4</td>
<td>72-96</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>96-120</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>120-144</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>144-168</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>168-192</td>
<td></td>
</tr>
</tbody>
</table>

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

**Industrial Experience**

**General**

Students enrolled in Bachelor of Engineering programmes 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.

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 programme. 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 a 'double sandwich' pattern should consult with the Head of their Departments 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.

**Exemptions in Courses**

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

**Exemptions for TAFE Certificates**

Faculty Board has approved the granting of exemptions to students enrolled in courses who hold certain TAFE Certificates. The exemptions to be granted will normally vary according to the TAFE qualification obtained, the course programme in which the candidate is enrolled and the current requirements of that programme. Details are available from the Faculty Secretary. Exemptions have previously been granted to holders of the following qualifications.

- Cartography Certificate
- Civil Engineering Certificate
- Computer Services Technology Certificate
- Electrical Engineering Certificate
- Electronics Engineering Certificate
- Electronics and Communications Certificate
- Engineering Surveying Certificate
- Land and Engineering Survey Drafting Certificate
- Marine Engineering Technology Certificate
- Mechanical Engineering Certificate
- Metallurgy Certificate
- Naval Architecture Certificate

**Production Engineering Certificate**

Structural Engineering Certificate
Surveying Certificate / Higher Certificate

The question of the exemptions to be granted for the recently introduced TAFE Associate Diploma courses is currently under consideration.
BACHELOR DEGREE COURSE PROGRAMMES

About This Section
This section contains the detailed bachelor degree course programmes which have been approved by Faculty Board in accordance with the Regulations Governing Bachelor Degrees in the Faculty of Engineering.
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 Programme and associated requirements of the course in which they are enrolled. Attention is particularly drawn to the General Course Rules 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 Secretary or the Course Coordinator indicated in the course entry concerned.

Guide to Course Attendance Patterns
Course Programmes are given in this Section for all bachelor degree courses. All students must complete the requirements of the relevant Course Programme 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 Secretary.

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 course may be completed in a minimum of 4 years of full-time study. The criterion for classification as a full-time student is enrolment in three-quarters or more of the normal full-time programme. Thus a student enrolled in 36 credit points or more is regarded as a full-time student.

Part-time Attendance
All or part of each Approved Programme 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 programme.
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 36 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 Elective units as permitted by the Elective Requirements of the relevant course.

Sandwich Programmes
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 I 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. 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 MUST apply for re-admission to their course through UCAC in September of each year in which they are not enrolled at the University. Re-admission will be automatically approved provided only one year of absence is taken at a time and an application for re-admission is made through UCAC.

The Traineeship Pattern
Some traineeships may continue to be offered on the basis of a part-time attendance pattern, however the following programme 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.

Finding 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.

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 36 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 Elective units as permitted by the Elective Requirements of the relevant course.

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SECTION FIVE

CHEMICAL ENGINEERING COURSE PROGRAMME

Chemical Engineering

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

Designated Department: Department of Chemical Engineering

Course Coordinator: Mr J. Roberts

Course Programme Subjects Credit Points

YEAR I

Semester 1
CHEE111 Industrial Process Principles 3
CHEM101 Chemistry 1 6
MATH102 Mathematics 102 * 6
MECH102 Programming 3
PHYS102 Physics 102 * 6

Semester 2
CHEE112 Introduction to Chemical Engineering 6
CHEE113 Chemical and Manufacturing Processes 6
CHEM102 Chemistry 102 6
MATH103 Mathematics 103 * 6

* Approved Options
1. MATH101 and MATH102 may replace MATH102 and MATH103.
2. PHYS101 may replace PHYS102.

YEAR II

Semester 1
CHEE241 Design Principles 6
CHEE242 Chemical Engineering Computations 6
CHEE261 Transfer Processes 1 6
CHEE261 Transfer Processes 2 6
CHEE281 Laboratory 1 3
MATH201 Multivariable Calculus 3

Semester 2
CHEE262 Transfer Processes 2 6
CHEE261 Transfer Processes 2 6
CHEM201 Physical Chemistry 6
MATH202 Partial Differential Equations 1 3
MATH203 Ordinary Differential Equations 1 3

YEAR III

Semester 1
CHEE331 Modelling of Processes 3
CHEE331 Kinetics and Thermodynamics 3
CHEE341 Project Engineering and Management Principles 6
CHEE382 Laboratory 3 3
Technical Electives 9

Semester 2
CHEE342 Safety and Environment 6
CHEE372 Separation Processes 6
CHEE391 Engineering Applications Laboratory 3
CHEE383 Laboratory 4 3
Technical Electives 5 48

YEAR IV

Semester 1
CHEE421 Process Control and Instrumentation 6
CHEE431 Reaction Engineering 12
CHEE495 Design Project 12
CHEE491 Seminar 3
CHEE497 Research Project 12
General Electives 12

Semester 2
CHEE421 Process Control and Instrumentation 6
CHEE431 Reaction Engineering 12
CHEE495 Design Project 12
CHEE491 Seminar 3
CHEE497 Research Project 12
General Electives 12

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

Technical Electives
Technical Elective subjects 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 September of the previous year.

Subjects Credit Points
CHEE531 Electrochemistry and Corrosion 3
CHEE532 Transport Phenomena 3
CHEE533 Surface Chemistry 1 6
CHEE534 Biototechnology 3
CHEE535 Mineral Processing 1 6
CHEE536 Process Synthesis 3
CHEE537 Fuel Technology 1 3
CHEE538 Process Metallurgy 1 3

General Electives
General 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 elective subjects may be offered in any one year. Students will be advised in September of the preceding year of the particular CHIE100 level elective subjects which are intended to be offered.

Recommended General Elective Subjects Credit Points
CHEE191 Industrial Experience 3
CHEE192 Industrial Experience 3
CHEE193 Industrial Experience 3
CHEE194 Industrial Experience 3
CHEE451 Surface Chemistry 1 2
CHEE452 Mineral Processing 2 3
CHEE453 Process Optimization 3
CHEE454 Fuel Technology 2 3
CHEE455 Heat Transfer 3
CHEE456 Process Metallurgy 2 3
CHEE456 Advanced Design Project 6
CHEE459 Advanced Research Project 6
PHIL391 Technology and Human Values 1 6
STAT205 Engineering Statistics 3

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

SECTION FIVE

CHEMICAL ENGINEERING COURSE PROGRAMME

Prerequisite, Corequisite and Assumed Knowledge Requirements
The prerequisite, corequisite and Assumed knowledge requirements of individual subjects are listed in the schedule presented in Section 8 of this Handbook. 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 Programme given above. All or part of this programme may be completed by part-time attendance. 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:

Subjects Credit Points
CHEE111 Industrial Process Principles 3
CHEM101 Chemistry 101 6
MECH102 Programming 3
CHEE112 Introduction to Chemical Engineering 6
CHEM102 Chemistry 102 6

STAGE I

Semester 1
CHEE111 Industrial Process Principles 3
CHEM101 Chemistry 101 6
MECH102 Programming 3
CHEE112 Introduction to Chemical Engineering 6
CHEM102 Chemistry 102 6

Semester 2
CHEE111 Industrial Process Principles 3
CHEM101 Chemistry 101 6
MECH102 Programming 3
CHEE112 Introduction to Chemical Engineering 6
CHEM102 Chemistry 102 6

STAGE II

Semester 1
CHEE111 Industrial Process Principles 3
CHEM101 Chemistry 101 6
MECH102 Programming 3
CHEE112 Introduction to Chemical Engineering 6
CHEM102 Chemistry 102 6

Semester 2
CHEE111 Industrial Process Principles 3
CHEM101 Chemistry 101 6
MECH102 Programming 3
CHEE112 Introduction to Chemical Engineering 6
CHEM102 Chemistry 102 6

STAGE III

Semester 1
CHEE111 Industrial Process Principles 3
CHEM101 Chemistry 101 6
MECH102 Programming 3
CHEE112 Introduction to Chemical Engineering 6
CHEM102 Chemistry 102 6

Semester 2
CHEE111 Industrial Process Principles 3
CHEM101 Chemistry 101 6
MECH102 Programming 3
CHEE112 Introduction to Chemical Engineering 6
CHEM102 Chemistry 102 6

STAGE IV

Semester 1
CHEE111 Industrial Process Principles 3
CHEM101 Chemistry 101 6
MECH102 Programming 3
CHEE112 Introduction to Chemical Engineering 6
CHEM102 Chemistry 102 6

Semester 2
CHEE111 Industrial Process Principles 3
CHEM101 Chemistry 101 6
MECH102 Programming 3
CHEE112 Introduction to Chemical Engineering 6
CHEM102 Chemistry 102 6

Combined Degree Programmes
Combined degree programmes 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 second degree of Bachelor of Arts (BA), Bachelor of Commerce (BCom), Bachelor of Economics (BEC), Bachelor of Mathematics (BMath) and Bachelor of Science (BSc). Individual subjects in the programme are identical to those required in the Chemical Engineering programme. Combined degree programmes each require a minimum of 5 years full-time study.

Note that students undertaking a combined degree programme are required to complete two distinct programmes concurrently and therefore the annual enrolment required by such a programme may exceed the normal annual load of 48 credit points. Also note that HECS will be calculated on the basis of the proportion which each individual subject counts in the programme of the separate degree of which it forms part and not on the proportion it contributes to any combined degree programme. Timetabling constraints may limit the choice of subjects offered.

Students normally apply to enter combined degree programmes at the conclusion of Year 1. Most combined degree programmes require a WAM of 70 for entry. Applications should be submitted on an Application for Course Transfer form by the due date for re-enrollment. The Faculty Secretary may be consulted regarding application details and course requirements.

Transition Arrangements
The Course Programme has been amended with effect from the commencement of the 1990 academic year. All students enrolled in this course or any combined degree programme of which it forms part, are required to meet the requirements of the new Course Programme. Appropriate exemptions in the new Course Programme will be granted for work previously completed by continuing students. No transition subjects will be offered.

Students who complete all subjects in which they were enrolled on 31 August 1989 without failure should re-enrol in accordance with the Transition Statement issued to them. Students who do not successfully complete all such subjects, must clarify their position in the new Course Programme before finalising their 1990 enrolment at the appropriate Re-enrolment Approval Session in February 1990.

Any student who believes they are disadvantaged by the programme set out on the Transition Statement, may, after consulting the Course Coordinator, apply in writing to the Dean for consideration of their case. In order to provide for exceptional cases in transition, the Dean may determine the transition programme to be followed.

Students following standard programmes in the old Course Programme will proceed as follows.

Year completed in 1989 Required to complete subsequently
Year I Year II, Year III and Year IV
Year II Year III and Year IV
Year III Year IV
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 Programme

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
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</thead>
<tbody>
<tr>
<td>CIVL102 Mathematics 102</td>
<td>6</td>
</tr>
<tr>
<td>CIVL121 Materials 1</td>
<td>3</td>
</tr>
<tr>
<td>PHYS101 Physics 102</td>
<td>3</td>
</tr>
<tr>
<td>SURY111 Surveying 1</td>
<td>3</td>
</tr>
<tr>
<td>CIVL111 Mechanics and Structures</td>
<td>3</td>
</tr>
<tr>
<td>CIVL131 Fluid Mechanics 1</td>
<td>3</td>
</tr>
<tr>
<td>CIVL103 Mathematics 103</td>
<td>6</td>
</tr>
<tr>
<td>MECH102 Programming</td>
<td></td>
</tr>
<tr>
<td>MECH111 Engineering Drawing</td>
<td></td>
</tr>
<tr>
<td>SURY112 Surveying 2</td>
<td>6</td>
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Full year: PHIIL391 Technology and Human Values 1 6

YEAR I

Semester 1

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVL317 Structural Design 2</td>
<td>6</td>
</tr>
<tr>
<td>CIVL326 Soil Mechanics 2</td>
<td>3</td>
</tr>
<tr>
<td>CIVL327 Concrete and Metals Technology</td>
<td>3</td>
</tr>
<tr>
<td>CIVL342 Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>CIVL352 Management</td>
<td>3</td>
</tr>
<tr>
<td>CIVL382 Finite Element Methods</td>
<td>3</td>
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</tbody>
</table>

Semester 2

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVL418 Theory of Structures 3</td>
<td>3</td>
</tr>
<tr>
<td>CIVL426 Geotechnical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CIVL435 Water Resources Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CIVL455 Civil Engineering Design 1</td>
<td>9</td>
</tr>
</tbody>
</table>

Full year: CIVL454 Civil Engineering Design 2 9

YEAR II

Semester 1

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
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</thead>
<tbody>
<tr>
<td>CIVL212 Mechanics of Solids</td>
<td>3</td>
</tr>
<tr>
<td>CIVL222 Materials 2</td>
<td>3</td>
</tr>
<tr>
<td>CIVL225 Fluid Mechanics 2</td>
<td>3</td>
</tr>
<tr>
<td>CIVL241 Environmental Science</td>
<td>3</td>
</tr>
<tr>
<td>CIVL271 Transportation Engineering</td>
<td></td>
</tr>
<tr>
<td>LAW261 Legal Process</td>
<td></td>
</tr>
<tr>
<td>MATH101 Multivariable Calculus</td>
<td>3</td>
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</tbody>
</table>

Semester 2

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVL213 Theory of Structures 1</td>
<td>3</td>
</tr>
<tr>
<td>CIVL223 Materials 3</td>
<td>3</td>
</tr>
<tr>
<td>CIVL233 Field Mechanics 3</td>
<td>3</td>
</tr>
<tr>
<td>CIVL251 Systems</td>
<td>3</td>
</tr>
<tr>
<td>GEBL224 Engineering Geology</td>
<td>6</td>
</tr>
<tr>
<td>MATH103 Ordinary Differential Equations 1</td>
<td>3</td>
</tr>
<tr>
<td>CIVL105 Engineering Computations</td>
<td>3</td>
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YEAR III

Semester 1

<table>
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<th>Subjects</th>
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</tr>
</thead>
<tbody>
<tr>
<td>CIVL314 Theory of Structures 2</td>
<td>3</td>
</tr>
<tr>
<td>CIVL315 Stress Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CIVL316 Structural Design 1</td>
<td>6</td>
</tr>
<tr>
<td>CIVL325 Soil Mechanics 1</td>
<td>3</td>
</tr>
<tr>
<td>CIVL334 Open Channel Hydraulics</td>
<td>3</td>
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<tr>
<td>CIVL381 Statistical Methods</td>
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Semester 2

<table>
<thead>
<tr>
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<tr>
<td>CIVL427 Structural Design 2</td>
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</tr>
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<td>CIVL437 Concrete and Metals Technology</td>
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Semester 3

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YEAR IV

Semester 1

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<tr>
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<table>
<thead>
<tr>
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</thead>
<tbody>
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Full year: CIVL455 Project 9

General Course Rules

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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.

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<tbody>
<tr>
<td>CIVL326 Safety and Environment</td>
<td>6</td>
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<tr>
<td>CIVL191 Industrial Experience *</td>
<td>3</td>
</tr>
<tr>
<td>CIVL193 Industrial Experience *</td>
<td>3</td>
</tr>
<tr>
<td>CIVL194 Industrial Experience *</td>
<td>3</td>
</tr>
<tr>
<td>CIVL419 Masonry and Timber Design</td>
<td>3</td>
</tr>
<tr>
<td>CIVL420 Dynamics and Stability of Structures</td>
<td>3</td>
</tr>
<tr>
<td>CIVL429 Rock Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CIVL437 River and Coastal Engineering</td>
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<td>CIVL472 Highway Engineering</td>
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<td>CIVL491 Special Topic</td>
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<td>CIVL492 Special Topic</td>
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<tr>
<td>ECON371 Principles of Economics</td>
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<tr>
<td>MATH103 Mathematics 103</td>
<td>3</td>
</tr>
<tr>
<td>MATH202 Partial Differential Equations 1</td>
<td>3</td>
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<tr>
<td>SURY213 Surveying 3</td>
<td>6</td>
</tr>
<tr>
<td>SURY214 Optics and Mining Surveying</td>
<td>3</td>
</tr>
</tbody>
</table>

* Approved Options

1. MATH101 and MATH102 may replace MATH102 and MATH103.
2. PHYS101 may replace PHYS102.

Combined Degree Programmes

Combined degree programmes are 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 a degree of Bachelor of Arts (BA), Bachelor of Mathematics (BMath) and Bachelor of Science (BSc). A programme 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 programme are identical to those required in the Civil Engineering programme. Combined degree programmes each require a minimum of 5 years full-time study.

Note that students undertaking a combined degree programme are attempting two distinct programmes concurrently. Students normally apply to enter combined degree programmes at the conclusion of Year 1. Most combined degree programmes require a WAM of 70 for entry. However, the BE(Civil Engineering)/BSurv programme normally requires satisfactory progression after the completion of Year 1 of either programme (that is a WAM of 55 or more) for entry. Applications should be submitted on an Application for Course Transfer form by the due date for re-enrolment. The Faculty Secretary may consult regarding application details and course requirements.

The detailed BE(Civil Engineering)/BSurv combined degree programme is summarised in the Surveying section.

## Computer Engineering

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

**Designated Department:** Department of Electrical Engineering and Computer Science

**Course Coordinator:** Associate Professor P.J. Moyle

### Programme Course

<table>
<thead>
<tr>
<th>Year</th>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>SEM 1</td>
<td>MATH102 Mathematics 102 *</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PHYS102 Physics 102</td>
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<tr>
<td></td>
<td></td>
<td>MATH121 Materials 1</td>
</tr>
<tr>
<td></td>
<td>SEM 2</td>
<td>MATH103 Mathematics 103 *</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PHYS103 Physics 103</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CIVL111 Mechanics and Structures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MATH111 Engineering Drawing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ELEC110 Electrical Engineering 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MECH101 Introduction to Engineering</td>
</tr>
</tbody>
</table>

* Approved Option
MATH102 assumes attainment of a mark of at least 110/150 in 3 unit Mathematics at the NSW HSC examination or completion of MATH101. Students unprepared for entry to MATH102 may, with the permission of the Course Coordinator, take MATH101 in Semester 1 and MATH102 in Semester 2 of Year 1. MATH101 will then be taken in the year of enrolment following completion of MATH102. MATH103 may be taken concurrently with most Year II subjects. Full-time students on track to complete in minimum time should consult the Course Coordinator regarding their intended Year II and Year III programmes. In terms of total course requirements, MATH101 will count in lieu of 6-credit points of General Elective.

### Year II

<table>
<thead>
<tr>
<th>Semester</th>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>SEM 1</td>
<td>MATH201 Multivariable Calculus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MATH206 Complex Analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PHYS201 Quantum Mechanics and Electromagnetics</td>
</tr>
<tr>
<td></td>
<td>SEM 2</td>
<td>MATH203 Ordinary Differential Equations 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MATH208 Linear Algebra 1 **</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ELEC220 Electronics 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ELEC230 Computer Science 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ELEC230 Electrical Engineering 2</td>
</tr>
</tbody>
</table>

* It is expected that MATH208 will be offered in Semester 1 from 1991.

### Year III

<table>
<thead>
<tr>
<th>Semester</th>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>COMP201 Advanced Data Structures</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>COMP205 Programming in C</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH212 Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>COMP204 Programming Language Semantics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>COMP206 Theory of Computation</td>
<td>3</td>
</tr>
</tbody>
</table>

* Approved Option

### Year IV

<table>
<thead>
<tr>
<th>Semester</th>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>ELEC230 Computer Science Project and Seminar</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>ELEC231 Advanced Computer Software</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>ELEC232 Computer Systems</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>COMP301 Compiler Design</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>COMP303 Computer Networks</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>COMP304 Database Design</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>COMP306 Computer Graphics</td>
<td>6</td>
</tr>
</tbody>
</table>

* Approved Option

See note re MATH101 in full course programme.
MECH121 forms part, The required at various times during the Semester. Both SECfION CNLll1 of the timetable. Full-time study is recommended after consulting commencement of the 1990 academic year. All students enrolled PHYS103 with the Transition Statement issued to them. After completion of the above programme attendance requirement the new (BE) degree in the specialisation of Computer Engineering in the first year of study of each programme will proceed in Year I. It is expected that MATII02 will then be offered in Semester 1 and MAHI02 in Semester 2 in Year IV. Students intending to enrol in a non-standard programme. Recommended electives are listed below.

**Recommended Elective Subjects**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL101 Introduction to Philosophy</td>
<td>12</td>
</tr>
<tr>
<td>PHYS101 Physics 101</td>
<td>6</td>
</tr>
<tr>
<td>PHYS102 Physics 102 *</td>
<td>6</td>
</tr>
<tr>
<td>PSYC103 Psychology 103</td>
<td>6</td>
</tr>
<tr>
<td>PSYC101 Psychology Introduction 1</td>
<td>6</td>
</tr>
<tr>
<td>PSYC102 Psychology Introduction 2</td>
<td>6</td>
</tr>
</tbody>
</table>

**Semester 2**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP301 Advanced Data Structures</td>
<td>3</td>
</tr>
<tr>
<td>COMP303 Assembly Language</td>
<td>3</td>
</tr>
<tr>
<td>COMP305 Programming in C</td>
<td>3</td>
</tr>
<tr>
<td>MAHI212 Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MAHI215 Operations research **</td>
<td>3</td>
</tr>
<tr>
<td>STAT203 Queues and Simulation</td>
<td>3</td>
</tr>
<tr>
<td>Year II Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

**Semester 3**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP200 Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>COMP204 Programming Language Semantics</td>
<td>3</td>
</tr>
<tr>
<td>COMP206 Theory of Computation</td>
<td>3</td>
</tr>
<tr>
<td>MATH208 Linear Algebra 1 **</td>
<td>3</td>
</tr>
<tr>
<td>MATH216 Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>PHIL242 Basic Symbolic Logic</td>
<td>3</td>
</tr>
<tr>
<td>Year II Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

**Combination Degree Programmes**

Students wishing to enter the BE/(Computer Engineering)/(BMath and BE/(Computer Engineering)/(BCompSc combined degree programmes should consult the Course Coordinator.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP301 Computer Network</td>
<td>6</td>
</tr>
<tr>
<td>COMP303 Computer Networks</td>
<td>6</td>
</tr>
<tr>
<td>COMP305 Design and Analysis of Algorithms</td>
<td>6</td>
</tr>
</tbody>
</table>

**Prerequisite, Corequisite and Assumed Knowledge Requirements**

The prerequisite, corequisite and Assumed knowledge requirements of individual subjects are listed in the schedule presented in Section 8 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.

**General Course Rules**

The attention of students is drawn to the General Course Rules of the Faculty published in the Faculty Policy Section of this Handbook. These rules are particularly important for students intending to enrol in a non-standard programme.
**Computer Science Programme**

**Semester 1**
- MATH102: Mathematics 102 (6)
- MATH103: Mathematics 102* (6)
- COMP101: Computer Science 1 (12)

*Approved Option

See note re MATH101 in full course programme.

**Semester 2**
- Year 1 Electives (6)
- ELEC130: Electrical Engineering 1 (6)
- ELEC170: Computer Engineering 1 (6)

**Combined Degree Programmes**

Combined degree programmes are available which allow completion of the requirements for the Bachelor of Computer Science and Bachelor of Engineering. Students may undertake the combined degree programme each year or two part-time years. The programme is normally undertaken by students with a superior record in the disciplines of Computer Science and Engineering.

Students following standard programmes in the old Course Programme will proceed as follows.

Year completed in 1989 Required to complete subsequently

- Year 1 and Year II
- Year II (including Mathematics ICS) Year III

**Computer Science Honours**

- Degree: Bachelor of Computer Science (Honours) (BCompSc(Hons))
- Course Coordinator: Associate Professor G. Wrightson

The BCompSc(Hons) programme is a postgraduate degree taken over one full-time year or two part-time years. The programme is normally undertaken by students with a superior record in the BCompSc programme 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 programme. Entry to the programme is possible for graduates of other disciplines. Enquiries regarding admission should be directed to the Course Coordinator.

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

<table>
<thead>
<tr>
<th>Course Programme</th>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP425</td>
<td>Honours Project</td>
<td>12</td>
</tr>
<tr>
<td><em>Approved Option</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Electrical Engineering Programme**

- Degree: Bachelor of Engineering (BB) in Electrical Engineering
- Course Coordinator: Associate Professor P.J. Moylan

<table>
<thead>
<tr>
<th>Course Programme</th>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMESTER 1</td>
<td>Mathematics 102</td>
<td>6</td>
</tr>
<tr>
<td>MATH111</td>
<td>Engineering Drawing</td>
<td>3</td>
</tr>
<tr>
<td>PHYS102</td>
<td>Physics 102</td>
<td>6</td>
</tr>
<tr>
<td>SEMESTER 2</td>
<td>CIVL111</td>
<td>Mechanics and Structures</td>
</tr>
<tr>
<td>MATH103</td>
<td>Mathematics 103</td>
<td>6</td>
</tr>
<tr>
<td>MSTR101</td>
<td>Materials 1</td>
<td>3</td>
</tr>
<tr>
<td>PHYS103</td>
<td>Physics 103</td>
<td>6</td>
</tr>
</tbody>
</table>

**Transition Arrangements**

The Course Programme has been amended with effect from the commencement of the 1990 academic year. All students enrolled in this course or any combined course of which it forms part, are required to meet the requirements of the new Course Programme. Appropriate exemptions in the new Course Programme will be granted for work previously completed by continuing students. No transition subjects will be offered.

Students who complete all subjects in which they were enrolled on 31 August 1989 without failure should re-enrol in accordance with the Transition Statement issued to them. Students who do not successfully complete all such subjects, must clarify their position in the new Course Programme before finalising their 1990 enrolments at the appropriate re-enrolment Approval Session in February 1990.

It should be noted that students who have successfully completed Computer Science I prior to 1990 will be deemed to have satisfied the requirements for entry to all COMP200 level subjects. Similarly, students who have successfully completed Computer Science II prior to 1990 will be deemed to have satisfied the requirements for entry to all COMP300 level subjects.
The attention of students is drawn to the General Course Rules of Handbook. These rules are particularly important for students in the first year of study of each programme are identical to those requirements in Electrical Engineering Programme. Each combined degree programme requires a minimum of 5 years full-time study.

Note that students undertaking a combined degree programme are attempting two distinct programmes concurrently and therefore the annual enrolment required by such a programme may exceed the normal annual load of 48 credit points. Also note that HECS will be calculated on the basis of the proportion which each individual subject counts in the programme of the separate degree of which it forms part and not on the proportion it contributes to any combined degree programme. Timetabling constraints may limit the choice of subjects offered.

Students normally apply to enter combined degree programmes at the conclusion of Year 1. Application to either combined degree programmes requires a WAM of 70 for entry. Applications should be submitted by the due date for re-enrolment. The Faculty Secretary may be consulted regarding application details. Students wishing to enter the BIE(Electrical Engineering)/BMath and BIE(Electrical Engineering)/BSc combined degree programmes should consult the Course Coordinator.

### 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.

#### Electives

**Subjects**

- ELEC192 Industrial Experience ** 3
- ELEC193 Industrial Experience 3
- ELEC194 Industrial Experience ** 3
- ELEC195 Industrial Experience ** 3
- MATH202 Partial Differential Equations 3
- MATH205 Analysis - Metric Spaces 3
- MATH211 Group Theory 3
- MATH212 Discrete Mathematics 3
- MATH213 Mathematical Modelling 3
- MATH214 Mechanics 3
- MATH215 Operations Research 3
- MATH216 Numerical Analysis 3
- MIEC481 Engineering Administration * 3
- MIEC482 Engineering Economics * 3
- PHIL101 Introduction to Philosophy 12
- PHIL591 Technology & Human Values 1* 6

**Subjects Credit Points**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC192 Industrial Experience</td>
<td>3</td>
</tr>
<tr>
<td>ELEC193 Industrial Experience</td>
<td>3</td>
</tr>
<tr>
<td>ELEC194 Industrial Experience</td>
<td>3</td>
</tr>
<tr>
<td>ELEC195 Industrial Experience</td>
<td>3</td>
</tr>
<tr>
<td>MATH202 Partial Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH205 Analysis - Metric Spaces</td>
<td>3</td>
</tr>
<tr>
<td>MATH211 Group Theory</td>
<td>3</td>
</tr>
<tr>
<td>MATH212 Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH213 Mathematical Modelling</td>
<td>3</td>
</tr>
<tr>
<td>MATH214 Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>MATH215 Operations Research</td>
<td>3</td>
</tr>
<tr>
<td>MATH216 Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MIEC481 Engineering Administration</td>
<td>3</td>
</tr>
<tr>
<td>MIEC482 Engineering Economics</td>
<td>3</td>
</tr>
<tr>
<td>PHIL101 Introduction to Philosophy</td>
<td>12</td>
</tr>
<tr>
<td>PHIL591 Technology &amp; Human Values</td>
<td>6</td>
</tr>
</tbody>
</table>

Note: * Industrial Experience subjects may be taken by part-time students after Stage I.

**Prerequisite, Corequisite and Assumed Knowledge Requirements**

The prerequisite, corequisite and Assumed knowledge requirements of individual subjects are listed in the schedule presented in Section 8 of this Handbook. Enrollment 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.

### Year III

**Semester 1**

- MIEC1271 Thermodynamics 3
- MIEC1272 Mathematics Elective *** 3

**Semester 2**

- MIEC1310 Power Engineering 9
- MIEC1320 Electronics 9
- MIEC1350 Communications 6
- MIEC1370 Computer Engineering 12
- MIEC1361 Automatic Control 48

**General Course Rules**

All candidates may, after consultation with the Dean Students who do not successfully complete all such subjects, must clarify their position in the new Course Programme before finalising their course programme. Students in Year II may, after consultation with the Dean of School, be granted for work previously completed by them. Students who do not subsequently complete all such subjects, must clarify their position in the new Course Programme before finalising their course programme.

### Year IV

**Semester 1**

- ELEC195 Industrial Experience 6
- ELEC196 Industrial Experience 6
- ELEC197 Electrical Engineering 6
- ELEC198 Computer Engineering 6

**Semester 2**

- ELEC199 Industrial Experience 6
- ELEC200 Industrial Experience 6
- ELEC201 Electrical Engineering 6
- ELEC202 Computer Engineering 6

- ELEC193 Industrial Experience 3
- ELEC194 Industrial Experience 3
- ELEC195 Industrial Experience 3
- MATH202 Partial Differential Equations 3
- MATH205 Analysis - Metric Spaces 3
- MATH211 Group Theory 3
- MATH212 Discrete Mathematics 3
- MATH213 Mathematical Modelling 3
- MATH214 Mechanics 3
- MATH215 Operations Research 3
- MATH216 Numerical Analysis 3
- MIEC481 Engineering Administration * 3
- MIEC482 Engineering Economics * 3
- PHIL101 Introduction to Philosophy 12
- PHIL591 Technology & Human Values 1* 6

**Credit Points**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC195 Industrial Experience</td>
<td>6</td>
</tr>
<tr>
<td>ELEC196 Industrial Experience</td>
<td>6</td>
</tr>
<tr>
<td>ELEC197 Electrical Engineering</td>
<td>6</td>
</tr>
<tr>
<td>ELEC198 Computer Engineering</td>
<td>6</td>
</tr>
<tr>
<td>ELEC193 Industrial Experience</td>
<td>3</td>
</tr>
<tr>
<td>ELEC194 Industrial Experience</td>
<td>3</td>
</tr>
<tr>
<td>ELEC195 Industrial Experience</td>
<td>3</td>
</tr>
<tr>
<td>MATH202 Partial Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH205 Analysis - Metric Spaces</td>
<td>3</td>
</tr>
<tr>
<td>MATH211 Group Theory</td>
<td>3</td>
</tr>
<tr>
<td>MATH212 Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MATH213 Mathematical Modelling</td>
<td>3</td>
</tr>
<tr>
<td>MATH214 Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>MATH215 Operations Research</td>
<td>3</td>
</tr>
<tr>
<td>MATH216 Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MIEC481 Engineering Administration</td>
<td>3</td>
</tr>
<tr>
<td>MIEC482 Engineering Economics</td>
<td>3</td>
</tr>
<tr>
<td>PHIL101 Introduction to Philosophy</td>
<td>12</td>
</tr>
<tr>
<td>PHIL591 Technology &amp; Human Values</td>
<td>6</td>
</tr>
</tbody>
</table>

**Combined Degree Programmes**

Combined degree programmes are available which allow completion of the requirements for the Bachelor of Engineering (BIE) degree in the specialisation of Electrical Engineering together with the requirements for a degree of Bachelor of Mathematics (BMath) and Bachelor of Science (BSc). The subjects undertaken in the first year of study of each programme are identical to those requirements in Electrical Engineering Programme. Each combined degree programme requires a minimum of 5 years full-time study.

**Transition Arrangements**

The Course Programme has been amended with effect from the commencement of the 1990 academic year. All students enrolled in this course in any combined degree programme of which it forms part, are required to meet the requirements in the new Course Programme. Appropriate exemptions in the new Course Programme will be granted for work previously completed by continuing students. No transition subjects will be offered.

Students who complete all subjects in which they were enrolled on 31 August 1989 without failure should re-enrol in accordance with the Transition Statement issued to them. Students who do not successfully complete all such subjects, must clarify their position in the new Course Programme before finalising their course programme at the conclusion of Year 1. Admission to either combined degree programmes requires a WAM of 70 for entry. Applications should be submitted by the due date for re-enrolment. The Faculty Secretary may be consulted regarding application details.

Students wishing to enter the BIE(Electrical Engineering)/BMath and BIE(Electrical Engineering)/BSc combined degree programmes should consult the Course Coordinator.
**Industrial Engineering**

Degree: Bachelor of Engineering (BE) awarded in the specialization of Industrial Engineering

Designated Department: Department of Mechanical Engineering

Course Coordinator: Mr. G.D. Butler

### SECTION FIVE: INDUSTRIAL ENGINEERING COURSE PROGRAMME

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICH383</td>
<td>Quality Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MICH385</td>
<td>Computer Aided Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>MICH387</td>
<td>Operations Research 2</td>
<td>3</td>
</tr>
<tr>
<td>MICH356</td>
<td>Automatic Control</td>
<td>6</td>
</tr>
<tr>
<td>PHIL391</td>
<td>Technology and Human Values 1</td>
<td>6</td>
</tr>
<tr>
<td>Both Semesters</td>
<td></td>
<td>48</td>
</tr>
</tbody>
</table>

### YEAR I

**Semester 1**

- MATH102: Mathematics 102 * 3
- MECH102: Programming 3
- MECH111: Engineering Drawing 3
- PHYS102: Physics 102 * 6

**Semester 2**

- CIVIL111: Mechanics and Structures 3
- MATH103: Mathematics 103 * 6
- MECH121: Materials 1 3
- MECH103: Engineering Chemistry 3
- PHYS103: Physics 103 * 6

**Both Semesters**

- ELEC170: Computer Engineering 1 3
- MICH101: Introduction to Engineering 3 48

*Approved Options*

1. MATH101 and MATH102 may replace MATH102 and MATH103.
2. PHYS101 and PHYS102 may replace PHYS101 and PHYS103.

### Elective Requirements

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.

**General Course Rules**

- The attention of students is drawn to the General Course Rules of the Faculty published in the Faculty Policy Section of this Handbook. These rules are particularly important for students intending to enrol in any non-standard programme.

- **Approved Elective Subjects**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICH317</td>
<td>Bulk Materials Handling 1</td>
<td>3</td>
</tr>
<tr>
<td>MICH318</td>
<td>Conveying of Bulk Solids</td>
<td>3</td>
</tr>
<tr>
<td>MICH321</td>
<td>Industrial Experience</td>
<td>3</td>
</tr>
<tr>
<td>MICH324</td>
<td>Ceramic Science and Technology</td>
<td>3</td>
</tr>
<tr>
<td>MICH325</td>
<td>Polymer Science and Technology</td>
<td>3</td>
</tr>
<tr>
<td>MICH326</td>
<td>Fabrication of Metals</td>
<td>3</td>
</tr>
<tr>
<td>MICH333</td>
<td>Dynamics of Machines</td>
<td>3</td>
</tr>
<tr>
<td>MICH342</td>
<td>Mechanics of Solids 2</td>
<td>3</td>
</tr>
<tr>
<td>MICH352</td>
<td>Fluid Mechanics 2</td>
<td>6</td>
</tr>
<tr>
<td>MICH372</td>
<td>Heat Transfer 1</td>
<td>3</td>
</tr>
<tr>
<td>MICH386</td>
<td>Computer Aided Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>MICH407</td>
<td>Environmental Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MICH409</td>
<td>Vibration and Noise Problems</td>
<td>3</td>
</tr>
<tr>
<td>MICH412</td>
<td>Bulk Materials Handling 2</td>
<td>3</td>
</tr>
<tr>
<td>MICH413</td>
<td>Mechanical Engineering Design 3</td>
<td>3</td>
</tr>
<tr>
<td>MICH419</td>
<td>Maintenance Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MICH421</td>
<td>Composites in Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MICH425</td>
<td>Fluid Mechanics 3</td>
<td>3</td>
</tr>
<tr>
<td>MICH473</td>
<td>Thermodynamics 3</td>
<td>3</td>
</tr>
<tr>
<td>MICH474</td>
<td>Heat Transfer 2</td>
<td>3</td>
</tr>
<tr>
<td>MICH484</td>
<td>Engineering Economics 2</td>
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</tr>
<tr>
<td>MICH497</td>
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</tr>
<tr>
<td>MICH498</td>
<td>Directed Reading **</td>
<td>3</td>
</tr>
<tr>
<td>MGST201</td>
<td>Management 1</td>
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<td>MGST202</td>
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<td>Management 1</td>
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</tr>
<tr>
<td>MNGT202</td>
<td>Management 2</td>
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</tr>
<tr>
<td>PHIL392</td>
<td>Technology and Human Values 1</td>
<td>6</td>
</tr>
<tr>
<td>Both Electives ***</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

- *Approved Options*

1. MATH101 and MATH102 may replace MATH102 and MATH103.
2. PHYS101 and PHYS102 may replace PHYS101 and PHYS103.

### Transition Arrangements

The Course Programme has been amended with effect from the commencement of the 1990 academic year. All students enrolled in this course or any combined degree programme of which it forms part, are required to meet the requirements of the new Course Programme. Appropriate exemptions in the new Course Programme will be granted for work previously completed by continuing students. No transition subjects will be offered.

Students who complete all subjects to which they were enrolled on 31 August 1989 without failure should re-enrol in accordance with the Transition Statement issued to them. Students who do not successfully complete all such subjects, must clarify their position in the new Course Programme before finalizing their 1990 enrolment at the appropriate Re-enrolment Approval Session in February 1990.

Any student who believes they are disadvantaged by the programme set out on the Transition Statement, may, after consulting the Course Coordinator, apply in writing to the Dean for consideration of their case. In order to provide for exceptional cases in transition, the Dean may determine the transition programme to be followed.
### Mechanical Engineering Course Programme

**Degree:** Bachelor of Engineering (BE) awarded in the specialisation of Mechanical Engineering  
**Designated Department:** Department of Mechanical Engineering  
**Course Coordinator:** Mr J.W. Hayes

#### Year I  
**Semester 1**  
- MATH102 Mathematics 102  
- MECH102 Programming  
- PHYS102 Physics 102  

**Semester 2**  
- CIVIL111 Mechanics and Structures  
- MECH103 Mathematics 103  
- MECH121 Materials 1  
- MECH103 Engineering Chemistry  
- PHYS103 Physics 103  

**Both Semesters**  
- ELEC170 Computer Engineering 1  
- MECH101 Introduction to Engineering  

**Credit Points**  
- 6  
- 3  
- 6  

#### Year II  
**Semester 1**  
- MATH201 Multivariable Calculus  
- MECH204 Experimental Methods 1  
- MECH241 Mechanics of Solids 1  
- MECH271 Thermodynamics 1  
- STAT205 Engineering Statistics  

**Semester 2**  
- MATH203 Ordinary Differential Equations 1  
- MECH205 Engineering Computations  
- MECH222 Materials 2  
- MECH251 Fluid Mechanics 1  

**Both Semesters**  
- MECH213 Mechanical Engineering Design 1  
- MECH212 Dynamics  
- ELEC310 Electrical Engineering 1  

**Credit Points**  
- 3  
- 3  
- 3  

#### Year III  
**Semester 1**  
- MECH313 Materials 3  

**Semester 2**  
- ELEC211 Electrical Energy Conversion  
- MECH202 Partial Differential Equations 1  

**Credit Points**  
- 3  
- 3  

**Approved Options**  
1. MATH101 and MATH102 may replace MATH102 and MATH103.  
2. PHYS101 and PHYS102 may replace PHYS102 and PHYS110.

#### Year IV  
**Semester 1**  
- MECH333 Dynamics of Machines  
- MECH352 Fluid Mechanics 2  

**Semester 2**  
- MECH342 Mechanist of Solids 2  
- MECH372 Heat Transfer 1  
- MECH373 Thermodynamics 2  

**Both Semesters**  
- MECH361 Automatic Control  

**Credit Points**  
- 3  
- 6  

#### List A Subjects  
- 9  

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

#### Elective Requirements  
Electives may be chosen from the list of Approved Elective Subjects given below. A minimum of six 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 MECH 500 and 400 level elective subjects will be available.

#### Approved Elective Subjects  

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH204</td>
<td>Real Analysis 3</td>
</tr>
<tr>
<td>MATH206</td>
<td>Complex Analysis 1</td>
</tr>
<tr>
<td>MATH208</td>
<td>Linear Algebra 1</td>
</tr>
<tr>
<td>MECH111</td>
<td>Industrial Experience *</td>
</tr>
<tr>
<td>MECH112</td>
<td>Industrial Experience *</td>
</tr>
<tr>
<td>MECH113</td>
<td>Industrial Experience *</td>
</tr>
<tr>
<td>MECH105</td>
<td>Advanced Numerical Programming</td>
</tr>
<tr>
<td>MECH109</td>
<td>Noise Pollution and Control</td>
</tr>
<tr>
<td>MECH115</td>
<td>Computer Aided Design</td>
</tr>
<tr>
<td>MECH116</td>
<td>Finite Element Methods in Design</td>
</tr>
<tr>
<td>MECH117</td>
<td>Bulk Materials Handling 2</td>
</tr>
<tr>
<td>MECH118</td>
<td>Converting of Bulk Solids</td>
</tr>
<tr>
<td>MECH124</td>
<td>Ceramic Science and Technology</td>
</tr>
<tr>
<td>MECH125</td>
<td>Polymer Science and Technology</td>
</tr>
<tr>
<td>MECH126</td>
<td>Fabrication of Metals</td>
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<tr>
<td>MECH181</td>
<td>Methods Engineering</td>
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<td>MECH182</td>
<td>Engineering Administration</td>
</tr>
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<td>MECH183</td>
<td>Quality Engineering</td>
</tr>
<tr>
<td>MECH184</td>
<td>Engineering Economics 1</td>
</tr>
<tr>
<td>MECH185</td>
<td>Production Scheduling</td>
</tr>
<tr>
<td>MECH186</td>
<td>Computer Aided Manufacturing</td>
</tr>
<tr>
<td>MECH187</td>
<td>Operations Research 1</td>
</tr>
<tr>
<td>MECH188</td>
<td>Operations Research 2</td>
</tr>
<tr>
<td>MECH187</td>
<td>Environmental Engineering</td>
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<td>MECH1407</td>
<td>Vibration and Noise Problems</td>
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<tr>
<td>MECH1412</td>
<td>Bulk Materials Handling 2</td>
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<tr>
<td>MECH1419</td>
<td>Maintenance Engineering</td>
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<tr>
<td>MECH1421</td>
<td>Computer Aided Engineering</td>
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<td>MECH1431</td>
<td>Robotics</td>
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<td>MECH1453</td>
<td>Fluid Mechanics 3</td>
</tr>
<tr>
<td>MECH1473</td>
<td>Thermodynamics 3</td>
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<td>MECH1474</td>
<td>Heat Transfer 2</td>
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<td>MECH1484</td>
<td>Engineering Economics 2</td>
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<td>Directed Reading</td>
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<td>PHIL392</td>
<td>Technology and Human Values 2</td>
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<tr>
<td>General Electives **</td>
<td>12</td>
</tr>
</tbody>
</table>

* Industrial Experience subjects may be taken by part-time students after stage 1.  
** MECH497 and MECH498 are normally taken as substantial extensions to MECH396. Supervision must be arranged and the written permission of the Head of the Department obtained before enrolment will be permitted to these subjects.  
*** General Electives may be any subject(a) 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).**
SECTION FIVE

MECHANICAL ENGINEERING COURSE PROGRAMME

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 Programme given above. All or part of this programme 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

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
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</thead>
<tbody>
<tr>
<td>Semester 1</td>
<td></td>
</tr>
<tr>
<td>MATH102 Mathematics 102 *</td>
<td>6</td>
</tr>
<tr>
<td>MECH111 Engineering Drawing</td>
<td>3</td>
</tr>
<tr>
<td>Semester 2</td>
<td></td>
</tr>
<tr>
<td>CIVL111 Mechanics and Structures</td>
<td>3</td>
</tr>
<tr>
<td>MATH103 Mathematics 103 *</td>
<td>6</td>
</tr>
<tr>
<td>MECH103 Engineering Chemistry</td>
<td>3</td>
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<td>Both Semesters</td>
<td></td>
</tr>
<tr>
<td>MECH101 Introduction to Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

STAGE 2

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester 1</td>
<td></td>
</tr>
<tr>
<td>MECH102 Programming</td>
<td>3</td>
</tr>
<tr>
<td>PHYS102 Physics 102 *</td>
<td>6</td>
</tr>
<tr>
<td>Semester 2</td>
<td></td>
</tr>
<tr>
<td>MECH121 Materials 1</td>
<td>3</td>
</tr>
<tr>
<td>PHYS103 Physics 103 *</td>
<td>6</td>
</tr>
<tr>
<td>Both Semesters</td>
<td></td>
</tr>
<tr>
<td>ELEC170 Computer Engineering 1</td>
<td>6</td>
</tr>
</tbody>
</table>

* Approved Options
1. MATH101 and MATH102 may replace MATH102 and MATH103.
2. PHYS101 and PHYS102 may replace PHYS102 and PHYS103.

After completion of the above programme 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 Programme has been amended with effect from the commencement of the 1990 academic year. All students enrolled in this course or any combined degree programme of which it forms part, are required to meet the requirements of the new Course Programme. Appropriate exemptions in the new Course Programme will be granted for work previously completed by continuing students. No transition subjects will be offered.

Students who complete all subjects in which they were enrolled on 31 August 1989 without failure should re-enrol in accordance with the Transition Statement issued to them. Students who do not successfully complete all such subjects, must clarify their position in the new Course Programme before finalising their 1990 enrolment at the appropriate Re-enrolment Approval Session in February 1990.

Any student who believes they are disadvantaged by the programme set out on the Transition Statement, may, after consulting the Course Coordinator, apply in writing to the Dean for consideration of their case. In order to provide for exceptional cases in transition, the Dean may determine the transition programme to be followed.

Students following standard programmes in the old Course Programme will proceed as follows:

Year completed in 1989 Required to complete subsequently

Year I Year II

Year III and Year IV

Year III Year IV

Year IV

MECH102 Programming

ELEC130

MECH102 & MECH103

MATII102

Electives (3cp)

List A (6cp)

Electives (3cp)

MECH123

Combined Degree Programmes
Combined degree programmes are available which allow 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 Arts (BA), Bachelor of Commerce (BCom), Bachelor of Economics (BSc), Bachelor of Mathematics (BMath) and Bachelor of Science (BSc). The subjects undertaken in the first year of study of each programme are identical to those required in the Mechanical Engineering programme. Combined degree programmes each require a minimum of 5 years full-time study.

Note that students undertaking a combined degree programme are attempting two distinct programmes concurrently and therefore the normal annual load of 48 credit points. Also note that HECs will be calculated on the basis of the proportion which each individual subject counts in the programme of the separate degree of which it forms part and not on the proportion it contributes to any combined degree programme. Timetabling constraints may limit the choice of subjects offered.

SECTION FIVE

SURVEYING COURSE PROGRAMME

Students normally apply to enter combined degree programmes at the conclusion of Year 1. Most combined degree programmes require a WAM of 70 for entry. Applications should be submitted on an Application for Course Transfer form by the due date for re-enrolment. The Faculty Secretary may be consulted regarding application details and course requirements.

Surveying

Degree: Bachelor of Surveying (BSurv)

Designated Department: Department of Civil Engineering and Surveying

Course Coordinator: Associate Professor J.G. Pryer

Course Programme

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>YEAR I Semester 1</td>
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<tr>
<td>MATH102 Mathematics 102 *</td>
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<tr>
<td>MECH121 Materials 1</td>
<td>3</td>
</tr>
<tr>
<td>PHYS102 Physics 102 *</td>
<td>6</td>
</tr>
<tr>
<td>SURV111 Surveying 1</td>
<td>6</td>
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<tr>
<td>Semester 2</td>
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<tr>
<td>CIVL111 Mechanics and Structures</td>
<td>3</td>
</tr>
<tr>
<td>CIVL121 Fluid Mechanics 1</td>
<td>3</td>
</tr>
<tr>
<td>MATH103 Mathematics 103 *</td>
<td>6</td>
</tr>
<tr>
<td>MECH102 Programming</td>
<td>3</td>
</tr>
<tr>
<td>MECH111 Engineering Drawing</td>
<td>3</td>
</tr>
<tr>
<td>SURV112 Surveying 2</td>
<td>6</td>
</tr>
<tr>
<td>Full Year</td>
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<td>MECH101 Introduction to Engineering</td>
<td>3</td>
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</tbody>
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* Approved Options
1. MATH101 and MATH102 may replace MATH102 and MATH103.
2. PHYS101 may replace PHYS102.

YEAR II Semester 1

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Credit Points</th>
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<tbody>
<tr>
<td>CIVL121 Mechanics of Solids</td>
<td>3</td>
</tr>
<tr>
<td>CIVL232 Fluid Mechanics 2</td>
<td>3</td>
</tr>
<tr>
<td>CIVL271 Transportation Engineering</td>
<td>6</td>
</tr>
<tr>
<td>LAW291 Legal Process</td>
<td>3</td>
</tr>
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<td>MATH201 Multivariable Calculus</td>
<td>3</td>
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<td>SURV213 Surveying 3</td>
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<tr>
<td>Semester 2</td>
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</tr>
<tr>
<td>CIVL251 Systems</td>
<td>3</td>
</tr>
<tr>
<td>GROI224 Engineering Geology</td>
<td>6</td>
</tr>
<tr>
<td>LAW202 Property and Survey Law</td>
<td>3</td>
</tr>
<tr>
<td>MATH203 Ordinary Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>SURV214 Optics and Mining Surveying</td>
<td>3</td>
</tr>
<tr>
<td>SURV215 Electronic Distance Measurement</td>
<td>3</td>
</tr>
<tr>
<td>SURV233 Survey Computations</td>
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YEAR III Semester 1

<table>
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<tr>
<td>CIVL325 Soil Mechanics 1</td>
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<tr>
<td>CIVL381 Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>ECON371 Principles of Economics</td>
<td>6</td>
</tr>
<tr>
<td>SURV316 Hydrographic Surveying</td>
<td>3</td>
</tr>
<tr>
<td>SURV334 Error Theory</td>
<td>3</td>
</tr>
<tr>
<td>SURV361 Photogrammetry 1</td>
<td>6</td>
</tr>
</tbody>
</table>
## General Course Rules

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

### 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 SURV400 level elective subjects will be available.

### Recommended Elective Subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURV101</td>
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<tr>
<td>SURV102</td>
<td>3</td>
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<tr>
<td>SURV103</td>
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<td>SURV452</td>
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</tr>
<tr>
<td>CIVL222</td>
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<tr>
<td>CIVL223</td>
<td>3</td>
</tr>
<tr>
<td>CIVL241</td>
<td>3</td>
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<tr>
<td>CIVL334</td>
<td>3</td>
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<td>MATH101</td>
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<td>MECI1204</td>
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<td>PHIL391</td>
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* Industrial Experience subjects may be taken by part-time students after stage 1.

### Prerequisite, Corequisite and Assumed Knowledge Requirements

The prerequisite, corequisite and Assumed knowledge requirements of individual subjects are listed in the schedule presented in Section 8 of this Handbook. Enrollment 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 Programme given above. All or part of this programme 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

<table>
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<tr>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
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<tbody>
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<td>MATH102</td>
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<td>SURV111</td>
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#### STAGE 2

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#### STAGE 3

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<td>PHYS102</td>
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#### Full Year

<table>
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### Year completed in 1989

#### Year I

<table>
<thead>
<tr>
<th>Subject</th>
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<tr>
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#### Year II

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURV215</td>
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</tr>
</tbody>
</table>

#### Year III

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURV215</td>
<td></td>
</tr>
</tbody>
</table>

#### Year IV

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
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<tbody>
<tr>
<td>SURV215</td>
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</tbody>
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### Required to complete

#### Year I

<table>
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<tr>
<th>Subject</th>
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#### Year II

<table>
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</table>

#### Year III

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<tbody>
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<td>SUIV215</td>
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</tbody>
</table>

#### Year IV

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>SUIV215</td>
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</tr>
</tbody>
</table>

### Combined BE/BSurv Degree Programme

The combined degree programme 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 programme are attempting two distinct programmes concurrently and therefore the annual enrolment required by such a programme may exceed the normal annual load of 48 credit points. Also note that HECS will be calculated on the basis of the proportion which each individual subject counts in the programme of the separate degree of which it forms part and not on the proportion it contributes to any combined degree programme. Students normally apply to enter combined degree programmes at the conclusion of Year 1. Students who have completed the first year of either the Surveying or Civil Engineering programme and have attained a weighted average mark (WAM) of 35 for entry may be admitted. Applications should be submitted on an Application for Course Transfer form by the due date for re-enrolment. The Faculty Secretary may be consulted regarding application details. The Course Coordinator may be consulted regarding course requirements.

The detailed requirements are set out below.

### Year I

1. of either the Surveying or Civil Engineering programme (Total 44 credit points).

### Year II

1. CIVL212, CIVL213, CIVL222, CIVL223, CIVL232, CIVL233, CIVL241, CIVL251, CIVL271, MATH101, MATH201, MATH303, MECI1205, SURV213, SURV233 (Total 54 credit points)

### Year III

1. CIVL314, CIVL316, CIVL317, CIVL325, CIVL326, CIVL327, LAW101, LAW202, SURV334, SURV214, SURV215, SURV391, PHIL391 or ECON371 (Total 51 credit points)

### Year IV

1. CIVL315, CIVL334, CIVL342, CIVL353, CIVL381, CIVL382, SURV316, SURV351, SURV361, SURV362, SURV417, SURV418, SURV441 (Total 51 credit points)

### Year V

1. CIVL418, CIVL428, CIVL443, CIVL453, CIVL454, SURV472, SURV473, CIVL455 or SURV481 (Total 48 credit points)
POSTGRADUATE DEGREE AND DIPLOMA REGULATIONS

SECTION SIX

About This Section

This section contains the regulations governing the following degrees and postgraduate diplomas:

Diploma in Computer Science
Diploma in Computing
Diploma in Surveying
Master of Computer Science
Master of Computing
Master of Engineering
Master of Engineering Science
Master of Surveying
Doctor of Philosophy

Regulations Governing Postgraduate Diplomas in the Faculty of Engineering

1. General

These Regulations are made in accordance with the powers vested in the Council under By-law 5.2.1 and prescribe the conditions and requirements relating to the Postgraduate Diploma in Computer Science, the Postgraduate Diploma in Computing, and the Postgraduate Diploma in Surveying.

2. Definitions

In these Regulations and in the Schedule thereto, unless the context or subject matter otherwise indicates or requires:

"course" means the total requirements prescribed under these Regulations to qualify a candidate for the award of the Diploma;

"Course Coordinator" means the Head of the designated department or that Head of Department's nominee;

"credit point" means the workload indication of a subject determined by the relevant faculty board;

"Dean" means the Dean of the Faculty of Engineering;

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

"designated department" means the department identified as such in the schedule;

"Diploma" means the Postgraduate Diploma in Computing, the Postgraduate Diploma in Computer Science or the Postgraduate Diploma in Surveying as the case may be;

"Faculty Board" means the Faculty Board, Faculty of Engineering;

"Schedule" means the Schedule to these Regulations relevant to the Diploma in which a person is enrolled or proposing to enrol;

"subject" means a discrete component of the course for which a result may be recorded.

3. Admission to Candidature

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

To be eligible for admission to candidature for the Diploma, an applicant shall have satisfied the requirements for admission set out in the Schedule.

An application for admission to candidacy shall be considered by the Dean who, after considering the recommendation of the Course Coordinator, may approve or reject any application.

4. Exemptions

(1) The Faculty Board, on the recommendation of the Course Coordinator, may grant a candidate exemptions in the course in recognition of work completed in this University or elsewhere on such conditions as the Faculty Board may determine.

(2) The exemptions granted under this regulation shall not exceed 12 credit points.

5. Prerequisites, Corequisites and Assumed Knowledge

(1) The Faculty Board, on the recommendation of the Head of Department, may prescribe prerequisites, corequisites and/or assumed knowledge for a subject.

(2) Except with the approval of the Course Coordinator, a candidate may not enrol or continue enrolment in a subject unless he or she has attained a satisfactory result in any subject prescribed as its prerequisite, has already attained a satisfactory result or is concurrently enrolled in any subject prescribed as its corequisite and has already fully attempted any subject prescribed as assumed knowledge.

6. Enrolment

(1) In any year a candidate shall enrol only in those subjects which count towards completion of the requirements of the Diploma as are approved by the Course Coordinator.

(2) A candidate will not be permitted to enrol in any subject which is deemed by the Course Coordinator to be substantially equivalent to one which the candidate has previously counted towards a degree or diploma. In such a case the Course Coordinator may prescribe alternative subjects of equivalent total credit point value.

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

7. Variation of Enrolment - Including Withdrawal

A candidate shall comply with the requirements of Regulation 9 of the Regulations Governing Bachelor Degrees in the Faculty of Engineering.

8. Discontinuance and Re-Admission

(1) A candidate who, prior to completing requirements for the award of the Diploma, does not effectively re-enrol in such calendar year shall be deemed to have discontinued studies and, if re-admitted at a later date, and may be granted such exemptions for work previously completed in that course as are determined by the Faculty Board on the recommendation of the Course Coordinator.

(2) The provisions of Regulation 3 shall apply to applicants for re-admission.

9. Time Requirement

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

10. Award of the Diploma

(1) To qualify for the award of the Diploma a candidate shall complete to the satisfaction of the Faculty Board a programme of subjects approved by the Faculty Board on the recommendation of the Head of the designated department totalling 48 credit points.

(2) The Diploma shall be awarded as an ordinary diploma except that in cases where a candidate's performance has reached a standard determined to be appropriate by the Faculty Board, the Diploma may be awarded with merit.

11. Exceptional Circumstances

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

SCHEDULE 1 — POSTGRADUATE DIPLOMA IN COMPUTER SCIENCE

1. For the purposes of these Regulations the designated department for the Diploma shall be the Department of Electrical Engineering and Computer Science.

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

(a) have satisfied the requirements for admission to a degree in the University of Newcastle;

(b) have satisfied the requirements for admission to a degree in another university recognized for this purpose by the Faculty Board;

(c) hold such other qualifications approved by the Faculty Board for the purpose of admission to candidacy; and

(d) have met the level of competence in computer programming required by the Faculty Board.

Note: The level of competence in computer programming required by section 2 of the above Schedule is satisfied by completion of COMPI01 Computer Science 1 or COMPI02 Introduction to Programming or other studies deemed by the Course Coordinator to be equivalent. Intending applicants who do not meet this requirement may undertake COMPI02 as a non-degree student with a view to later admission to the Diploma. Students of the University who intend to enrol in the Diploma on completion of their degree studies are advised to include COMPI01 or COMPI02 in their degree studies if possible or otherwise to consider undertaking COMPI02 as an extramural subject.

SCHEDULE 2 — POSTGRADUATE DIPLOMA IN COMPUTING

1. For the purposes of these Regulations the designated department for the Diploma shall be the Department of Electrical Engineering and Computer Science.

2. To be eligible for admission to candidacy an applicant shall:
Regulations Governing Masters Degrees

Part I — General

1. (1) These Regulations prescribe the conditions and requirements relating to the degrees of Master of Architecture, Master of Arts, Master of Commerce, Master of 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.

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

"Faculty Board" means the Faculty Board of the Faculty responsible for the course in which a person is enrolled or is proposing to enrol;

"programme" means the programme of research and study prescribed in the Schedule;

"Schedule" means the Schedule of these Regulations pertaining to the course in which a person is enrolled or is proposing to enrol;

"thesis" means any thesis or dissertation submitted by a candidate.

(3) These Regulations shall not apply to degrees conferred honoris causa.

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

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

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

(a) have satisfied the requirements for admission to a degree in the University of Newcastle;

(b) have satisfied the requirements for admission to a degree in another university recognised for this purpose by the Faculty Board;

(c) hold such other qualifications approved by the Faculty Board for the purpose of admission to candidature.

(d) have met the level of competence in computer programming required by the Faculty Board.

Note: The level of competence in computer programming required by section 2 of the above Schedule is satisfied by completion of COMP101 Computer Science 1 or COMP102 Introduction to Programming or other studies deemed by the Course Coordinator to be equivalent. Intending applicants who do not meet this requirement may undertake COMP102 as a non-degree student with a view to later admission to the Diploma. Students of the University who intend to enrol in the Diploma on completion of their degree studies are advised to include COMP101 or COMP102 in their degree studies if possible or otherwise to consider undertaking COMP102 at an extraneous subject.

Schedule 3 — Postgraduate Diploma in Surveying

1. For the purposes of these Regulations the designated department for the Diploma shall be the Department of Civil Engineering and Surveying.

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

(a) have satisfied the requirements for admission to a degree in the University of Newcastle;

(b) have satisfied the requirements for admission to a degree in another university recognised for this purpose by the Faculty Board;

(c) have Registration as a Land Surveyor, or hold the Certificate of Competency issued by any of the Boards of Surveyors of Australia or New Zealand;

(d) hold such other qualifications approved by the Faculty Board for the purpose of admission to candidature.

General Information

[General information relating to the Schools of Administration & Technology, Education, Health and Visual Performances Arts (formerly attached to the Hunter Institute of Higher Education) may be found in Volume 10 of the University Calendar].

Principal Dates 1990

(See separate entry for Faculty of Medicine)

January

1 Monday Public Holiday — New Year’s Day
5 Friday Last day for return of Application for Re-Enrolment Form — Continuing Students
8 Monday Deferred Examinations begin
19 Friday Deferred Examinations end
26 Friday Public Holiday — Australia Day
31 Wednesday New students attend in person to enrol and pay charges

February

1 Tuesday Lecture Approval Sessions for re-enrolling students
13 Tuesday
20 Tuesday Late enrolment session for new students
21 Wednesday Late enrolment session for re-enrolling students
26 Monday First Semester begins

March

23 Friday Last day of variation of programme in relation to HECS liability for Semester I.

April

13 Friday Good Friday — Easter Rooms continues
23 Monday Lectures resume

May

20 Tuesday Last day for withdrawal without academic penalty from first semester subjects (See page (v) for Dean’s discretion)
30 Wednesday Public Holiday — Anzac Day

June

8 Friday First Semester ends
11 Monday Examinations begin
11 Monday Public Holiday — Queen’s Birthday
20 Friday Examinations end

Closing date for applications for admission to the Bachelor of Medicine and the Diploma in Aviation Science courses in 1991.

No guarantees can be given that variation of programmes for enrolments after this date will be processed by the relevant HECS census date (31 March Semester I; 31 August Semester II)

<i>1 date yet to be finalised</i>
Campus Traffic and Parking

Persons wishing to bring motor vehicles (including motor cycles) on to the campus are required to complete a parking registration form for each vehicle. Completed forms must be lodged with the Attendant (Parking) Office located off the foyer of the Great Hall. All persons must comply with the University's Traffic and Parking Regulations including parking in approved parking areas, complying with road signs and not exceeding 35 k.h.p. on the campus.

If the Manager, Buildings and Grounds, after affording the person a period of seven days in which to submit a written statement in satisfying that any person is in breach of Regulations, he may:

(a) warn the person against committing any further breach; or
(b) impose a fine; or
(c) refer the matter to the Vice-Chancellor.

The range of fines which may be imposed in respect of various categories of breach include:

- A student failing to notify the registered number of a vehicle brought on to the campus $10
- Parking in areas not set aside for parking $10
- Parking in special designated parking areas without a parking permit for that area $15
- Driving offences - including speeding and dangerous driving $30
- Failing to stop when signalled to do so by an Attendant (Patrol) $30
- Refusing to give information to an Attendant (Patrol) $30
- Failing to obey the directions of an Attendant (Patrol) $30

The Traffic and Parking Regulations are stated in full in the Calendar, Volume 1.

Section SIX

4. To qualify for admission to a degree of Master a candidate shall enrol and satisfy the requirements of these regulations including the Schedule.

5. The programme shall be carried out:

(a) under the guidance of a supervisor or supervisors either appointed by the Faculty Board or as otherwise prescribed in the Schedule; or

(b) as the Faculty Board may otherwise determine.

6. Upon request by a candidate the Faculty Board may grant leave of absence from the course. Such leave shall not be taken into account in calculating the period of the programme prescribed in the Schedule.

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

(2) A candidate who withdraws from any subject after the relevant date shall be deemed to have failed in that subject unless granted permission by the Dean to withdraw without penalty.

The relevant date shall be:

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

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

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

8. (1) If the Faculty Board is of the opinion that the candidate is not making satisfactory progress towards the degree then it may terminate the candidature or place such conditions on its continuation as it deems fit.

(2) For the purpose of assessing a candidate's progress, the Faculty Board may require candidates to submit a report or reports on their progress.

3. A candidate against whom a decision of the Faculty Board has been made under Regulation 8(1) of these Regulations may request that the Faculty Board cause the case to be reviewed. Such request shall be made to the Dean of the Faculty within seven days from the date of posting to the candidate the advice of the Faculty Board's decision or in the case of any other subject, the Monday of the 3rd week of second semester.

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

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

Part II - Examination and Results

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

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

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

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

(c) to require the candidate to undertake such further oral, written or practical examinations as the Faculty Board may prescribe; or

(d) not to recommend that the candidate be admitted to the degree, in which case the candidature shall be terminated.

Part III — Provisions Relating to Theses

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

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

13. The candidate shall give to the Secretary to the University three months' written notice of intention to submit a thesis and such notice shall be accompanied by a prescribed fee.

14. (1) The candidate shall comply with the following provisions concerning the presentation of a thesis:

(a) the thesis shall contain an abstract of approximately 200 words describing its content;

(b) the thesis shall be typed and bound in a manner prescribed by the University;

(c) three copies of the thesis shall be submitted together with:

(i) a certificate signed by the candidate that the main content of the thesis has not been submitted by the candidate for a degree of any other tertiary institution; and

(ii) a certificate signed by the supervisor indicating whether the candidate has completed the programme and whether the thesis is of sufficient academic merit to warrant examination; and

(iii) if the candidate so desires, any documentation or published work of the candidate bearing on the subject of the thesis or not.

(2) The Faculty Board shall determine the course of action to be taken should the certificate of the supervisor indicate that in the opinion of the supervisor the thesis is not of sufficient academic merit to warrant examination.
15. The University shall be entitled to retain the submitted copies of the thesis, accompanying documents and published work. The University shall be free to allow the thesis to be consulted or borrowed and, subject to the provisions of the Copyright Act, 1968 (Com), may issue it in whole or any part in photocopy or microfilm or other copying medium.

16. (1) For each candidate two examiners, at least one of whom shall be an external examiner (being a person who is not a member of the staff of the University) shall be appointed either by the Faculty Board or otherwise as prescribed in the Schedule.

(2) If the examiners' reports are such that the Faculty Board is unable to make any decision pursuant to regulation 11 of these Regulations, a third examiner shall be appointed either by the Faculty Board or otherwise as prescribed in the Schedule.

SCHEDULE 7 — MASTER OF ENGINEERING SCIENCE

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

(c) in exceptional cases produce evidence of possessing such academic and professional attainments as may be approved by the Faculty Board on the recommendation of the Head of Department in which the applicant proposes to carry out the programme.

3. (1) An applicant shall nominate the Department in which it is proposed to pursue the programme.

(2) In the case of each applicant the Head of the nominated Department shall:

(a) make recommendations to the Faculty Board on the applicant's suitability for admission to candidature; and

(b) advise Faculty Board as to the adequacy or otherwise of supervision available within the Department.

4. (1) To qualify for admission to degree a candidate shall pass a programme of subjects approved by the Faculty Board on the recommendation of the Head of the nominated Department consisting of:

(a) such work and examinations as may be prescribed by the Faculty Board; and

(b) a thesis embodying the results of an original investigation or design.

4. The programme shall be completed:

(a) in not less than two academic years except that, in the case of a candidate who has completed the requirements for a degree of Bachelor with honours or a qualification deemed by the Faculty Board to be equivalent or who has had previous research experience, the Faculty Board may reduce this period to not less than 18 credit points; and

(b) except with the permission of the Faculty Board, in not more than five years.

5. Except with the permission of the Faculty Board a candidate shall take part in research seminars within the Department of Electrical Engineering and Surveying.

SCHEDULE 14 — 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 any other 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 any other university; and

(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.

3. To qualify for admission to degree a candidate shall complete to the satisfaction of the Faculty Board a programme consisting of:

(a) such work and examinations as may be prescribed by the Faculty Board; and

(b) a thesis embodying the results of an original investigation or design.

4. The programme shall be completed:

(a) in not less than two academic years except that, in the case of a candidate who has completed the requirements for a degree of Bachelor with honours or a qualification deemed by the Faculty Board to be equivalent or who has had previous research experience, the Faculty Board may reduce this period to not less than 18 credit points; and

(b) except with the permission of the Faculty Board, in not more than five years.

5. Except with the permission of the Faculty Board a candidate shall take part in research seminars within the Department of Electrical Engineering and Surveying.

SCHEDULE 15 — MASTER OF SURVEYING

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

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 Surveying with honours in the University of Newcastle or any other university 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 any other university; and

(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.

3. To qualify for admission to degree a candidate shall complete to the satisfaction of the Faculty Board a programme consisting of:

(a) such work and examinations as may be prescribed by the Faculty Board; and

(b) a thesis embodying the results of an original investigation or design.

4. Except with the permission of the Faculty Board, which shall be given only in special circumstances, a candidate shall:

(a) conduct the major proportion of the investigation or design work in the University; and

(b) take part in research seminars within the Department of Electrical Engineering and Computer Science.

5. Except with the special permission of the Faculty Board:

(a) a full time candidate shall complete the programme in not less than two and not more than three calendar years from its commencement;

(b) a part time candidate shall complete the programme in not less than three and not more than five calendar years from its commencement.
Section Six

Requirements for Sections Six

The Faculty Board may grant standing to a candidate on such conditions as it may determine in respect of work undertaken by the candidate for an uncompleted qualification. Standing shall not be granted for more than half the programme.

3. Except with the permission of the Faculty Board a candidate shall complete the programme in not less than two and not more than five calendar years from its commencement.

Doctoral Degree Regulations

General

1. (a) These Regulations are made in accordance with the powers vested in the Council under By-law 5.2.1 and shall relate to the degrees of Doctor of Engineering, Doctor of Laws, Doctor of Medicine, Doctor of Science, Doctor of Surgery, and Doctor of Technology.

(b) In order to qualify for a doctoral degree the candidate shall comply with the requirements for the degree as set out in the appropriate Schedule of these Regulations.

(c) In these Regulations “Doctoral Degree Committee” means the Doctoral Degree Committee for the Faculty in which the candidate is enrolled or is proposing to enrol.

(d) These Regulations shall not apply to degrees conferred honoris causa.

Doctoral Degree Committee

2. (a) The Senate shall appoint for each Faculty a Doctoral Degree Committee consisting of:

(i) the Dean of the Faculty who shall preside at meetings of the Committee,

(ii) the Deputy Chairman of the Senate or the nominee of the Deputy Chairman, and

(iii) three members of the academic staff of the University nominated by the Board of the Faculty concerned.

Where the Committee is to discuss matters affecting the candidature of a particular person the Head of the Department or Division in which the person is carrying out or is proposing to carry out research or the nominee of the Head shall, if not already a member of the Committee, be invited to take part in such discussion as a non-voting member.

(b) The number of members constituting a quorum of the Committee shall be three.

(c) (i) A member nominated by the Faculty Board shall hold office for three years from the date of appointment and shall be eligible for reappointment, provided that the first three members appointed shall hold office for one, two and three years respectively.

(ii) In the event of a casual vacancy, a new member shall be appointed by the Senate on the nomination of the Faculty Board and shall hold office for the residue of the predecessor’s term of office.

Functions

3. The Doctoral Degree Committee shall be responsible for:

(a) Admission to Candidature

(i) considering the evidence of qualification for admission submitted by applicants;

(ii) considering the adequacy of facilities for supervision and research within the department or division concerned;

(b) Supervision of Candidates

(i) appointing a supervisor or supervisors on the recommendation of the Head of the Department or Division in which the candidate is to carry out research;

(ii) ensuring adequate supervision of candidates;

(iii) considering progress reports submitted annually by candidates and supervisors to ensure that progress is satisfactory;

(iv) terminating candidature if progress is considered unsatisfactory.

(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 Regulation 3(c)(ii) of these Regulations take one or more of the following actions, namely:

(a) review the reasons expressed by the examiners for their recommendations;

(b) direct 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 to act 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) (i) The two members appointed by the Senate shall hold office for three years from the date of appointment and shall be eligible for reappointment.

(ii) 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.

6. The Senate Review Committee shall be responsible for:

(a) advising Doctoral Degree Committees of procedures to be followed to resolve any doubt concerning the recommendation to be made to the Senate Review Committee;

(b) considering the recommendation of the Doctoral Degree Committee in the light of the report submitted with the recommendation and

(i) recommending that the Senate recommend to the Council that the degree be conferred; or

(ii) requesting the Doctoral Degree Committee to take specified further action; or

(iii) recommending to the Senate that the degree be not conferred.

SCHEDULE II — REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

1. An applicant for admission to candidature for the degree of Doctor of Philosophy shall:

(a) have satisfied all of the requirements for admission to the degree of Master or the degree of Bachelor with first or second class honours in the University of Newcastle or a degree from another university approved for this purpose by the Doctoral Degree Committee;

(b) have satisfied all of the requirements for admission to the degree of Bachelor with third class honours or the ordinary degree of Bachelor in the University of Newcastle or a degree from another university approved for this purpose by the Doctoral Degree Committee, and have achieved by subsequent work and study a standard recognised by the Doctoral Degree Committee as equivalent to at least second class honours; or

(c) in exceptional cases submit such other evidence of general and professional qualifications as may be approved by the Senate.

2. Before approving an admission to candidature the Doctoral Degree Committee

(a) shall be satisfied that the applicant can devote sufficient time to advanced study and research; and

(b) may require an applicant to sit for such examinations or carry out such work as the Committee may prescribe.
SECTION SIX

3. Upon admission to candidature the candidate shall enrol and shall pursue a programme of advanced study and research (which in these requirements shall be referred to as "the programme") prescribed by the Doctoral Degree Committee for not less than three nor more than five consecutive years or such different period as the Doctoral Degree Committee may approve, provided that in no case shall the period be less than two years.

4.(a) The programme shall be carried out in the University under the direction of a supervisor or supervisors appointed by the Doctoral Degree Committee on the recommendation of the Head of the Department or Division in which the candidate is to carry out the research.

(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, if it deems fit.

7. On completing the programme every candidate shall submit a thesis which complies with the following requirements

(a) the thesis shall be typed and bound in a manner prescribed by the University;

(b) 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 programme 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.

8. 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 any part in photostat or microfilm or other copying medium.

9. The candidate shall comply with the following provisions

(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 that 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;
Investigation of Programming (IP) prior to 1990 or completion of COMP308 COMP306 COMP204 The DipComp programme assumes a competence in a List B Subjects their programme as a List requirements of the DipComp course programme in a single year to applying for admission.

Other evidence of Programming competence will be considered by the approved subjects given below. In exceptional circumstances the Head of the Department of Electrical Engineering and Computer Science may approve enrolment in.

- List B Subjects

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP304</td>
<td>6</td>
</tr>
<tr>
<td>COMP305</td>
<td>6</td>
</tr>
<tr>
<td>COMP306</td>
<td>6</td>
</tr>
<tr>
<td>COMP307</td>
<td>6</td>
</tr>
<tr>
<td>COMP308</td>
<td>6</td>
</tr>
<tr>
<td>MGNT311</td>
<td>6</td>
</tr>
</tbody>
</table>

Diploma in Computing

**Designated Department:** Department of Electrical Engineering and Computer Science

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

The DipComp programme assumes a competence in Pascal programming. Previous completion of Computer Science I or Introduction to Programming (IP) prior to 1990 or completion of COMP101 Computer Science I or COMP102 Introduction to Programming meets this requirement. Other evidence of programming competence will be considered by the Course Coordinator. Students currently enrolled in bachelor degree programmes who intend to enrol in the DipCompSc should, if possible, include either COMP101 or COMP102 in their degree programme of study.

Students who do not meet the assumed level of programming competence may wish to complete COMP102 as a non-degree student prior to applying for admission.

While 48 credit points is normally considered a full workload for a single year of a course, it might not be possible to complete the requirements of the DipComp course programme in a single year of attendance because of subject prerequisite requirements.

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

**Course Programme**

The DipComp course programme approved by the Faculty Board requires completion of 48 credit points selected from the list of approved subjects given below. In exceptional circumstances the Head of the Department of Electrical Engineering and Computer Science may approve enrolment in other subjects.

<table>
<thead>
<tr>
<th>Approved Diploma in Computing Subjects</th>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP201 Advanced Data Structures</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMP202 Computer Architecture</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMP203 Assembly Language</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMP204 Programming Language Semantics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMP205 Programming in C</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMP206 Theory of Computation</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COMP301 Compiler Design</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP302 Artificial Intelligence</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP303 Computer Networks</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP304 Database Design</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP305 Design and Analysis of Algorithms</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP306 Software Engineering Principles</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP307 Operating Systems</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>MATH268 Linear Algebra I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MATH212 Discrete Mathematics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MATH215 Operations Research</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MATH216 Numerical Analysis</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>MGNT323 Management Information Systems</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>PHIL242 Symbolic Logic</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Diploma in Surveying

**Designated Department:** Department of Civil Engineering and Surveying

**Course Coordinator:** Associate Professor J.G. Fryer

The Postgraduate Diploma in Surveying 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 48 credit points, it might not be possible to complete the requirements of the DipSurv course programme in a single year of attendance because of subject prerequisite requirements. Subject prerequisites are, however, prescribed mainly in relation to the BCompSc programme. The prescribed prerequisites may therefore be waived for DipSurv students with an appropriate background. Enquiries regarding waiver of prerequisites should be directed to the Course Coordinator.

**Course Programme**

The DipSurv course programme approved by the Faculty Board requires completion of 48 credit points selected from the list of approved subjects given below and approved by the Course Coordinator. Enquiries regarding waiver of prerequisite should be directed to the Course Coordinator.

<table>
<thead>
<tr>
<th>Approved Diploma in Surveying Subjects</th>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON101 Economics I</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>ECON102 Principles of Economics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GEOG101 Introduction to Physical Geography</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>GEOG102 Introduction to Human Geography</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>LAW 291 Legal Process</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>LAW 292 Property and Survey Law</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SURV516 Hydrographic Surveying</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>SURV334 Error Theory</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>SURV561 Photogrammetry 1</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>CIVIL132 Management</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SURV551 Goodday 1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SURV362 Remote Sensing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SURV593 Land Boundary Definition</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>SURV417 Industrial and Other Surveying</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>SURV481 Control Networks</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SURV434 Astronomy</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>SURV482 Gloveley 2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SURV462 Photogrammetry 2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SURV463 Advanced Cartography</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SURV472 Land Valuation</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>SURV473 Town Planning</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>SURV481 Project</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

**Master of Computing**

**Degree:** Master of Computing (MComp)

**Designated Department:** Department of Electrical Engineering and Computer Science

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

The Master of Computing (MComp) programme is a postgraduate coursework degree programme which incorporates advanced project work. The course programme requires completion of a total of 96 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) programmes. 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 programme are listed below. In exceptional circumstances the Head of the Department of Electrical Engineering and Computer Science may approve enrolment in other subjects.

<table>
<thead>
<tr>
<th>Approved Master of Computing Subjects</th>
<th>Subjects</th>
<th>Credit Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP501 Compiler Design</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP502 Artificial Intelligence</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP503 Computer Networks</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP504 Database Design</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP505 Design and Analysis of Algorithms</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP506 Computer Graphics</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP507 Software Engineering Principles</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP508 Operating Systems</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP509 Advanced Artificial Intelligence</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP512 Formal Semantics of Programming Languages</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP503 Advanced Computer Architecture</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP504 Parallel Programming and VLSI</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP505 Digital Image Processing</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP506 Advanced Operating Systems</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP507 Advanced Computer Networks</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP508 Natural Language Processing</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP509 Advanced Compiler Design</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP511 Special Topic A</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP512 Special Topic B</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP513 Special Topic C</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP514 Special Topic D</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>COMP515 Special Topic E</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>COMP501 Master of Computing Project A*</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>COMP502 Master of Computing Project B*</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>COMP503 Master of Computing Project *</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

*Either COMP503 or both COMP501 and COMP502 must be completed.

**Master of Engineering Science**

The Master of Engineering Science (MEngSc) programme is a postgraduate coursework degree programme. The course programme requires completion of a total of 48 credit points of which at least 18, 21 or 24 credit points must be specified project work.

It has been decided that no further enrolments will be accepted in this programme pending the outcome of a review. Continuing students should consult the relevant Head of Department regarding selection of subjects for 1990.

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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 departments of other faculties which are included in the course programmes set out in Sections 5 and 7.

Guide to Subject Descriptions

Credit Point Value

The course programmes offered within the University from 1990 require full-time students completing course requirements in minimum time-to-undertake an annual workload of 48 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 programme. Similarly, the credit point value of a subject indicates the proportion of the annual UEICS liability which arises from enrolment in that subject. Further information on the meaning of credit points is given in the General Course Rules 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 usually indicate the sequence of a subject in a stream of subjects or within a course.

The departmental indications included in this Handbook are listed below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEB</td>
<td>Chemical Engineering</td>
</tr>
<tr>
<td>CHEM</td>
<td>Chemistry</td>
</tr>
<tr>
<td>CIVL</td>
<td>Civil Engineering and Surveying (Civil Engineering subject)</td>
</tr>
<tr>
<td>COMM</td>
<td>Commerce</td>
</tr>
<tr>
<td>COMP</td>
<td>Electrical Engineering and Computer Science (Computer Science subject)</td>
</tr>
<tr>
<td>ECON</td>
<td>Economics</td>
</tr>
<tr>
<td>GEOL</td>
<td>Geology</td>
</tr>
<tr>
<td>LAW</td>
<td>Law</td>
</tr>
<tr>
<td>ELEC</td>
<td>Electrical Engineering and Computer Science (Electrical or Computer Engineering subject)</td>
</tr>
<tr>
<td>MATH</td>
<td>Mathematics</td>
</tr>
<tr>
<td>MECH</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>MNGT</td>
<td>Management</td>
</tr>
<tr>
<td>PHIL</td>
<td>Philosophy</td>
</tr>
<tr>
<td>PHYS</td>
<td>Physics</td>
</tr>
<tr>
<td>PSYC</td>
<td>Psychology</td>
</tr>
<tr>
<td>STAT</td>
<td>Statistics</td>
</tr>
<tr>
<td>SURV</td>
<td>Civil Engineering and Surveying (Surveying subject)</td>
</tr>
</tbody>
</table>

Prerequisites, Corequisites and Assumed Knowledge

Many subjects have prerequisite, corequisite or assumed knowledge requirements. The meaning of the terms are defined in the relevant degree regulations. The prerequisite, corequisite or assumed knowledge 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, corequisite or assumed knowledge requirements of that subject. Students should obtain any such waiver in writing on the form available from the School Office and submit the completed form attached to any request for variation of programme.

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 4 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 48 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 3 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 emanates.

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.

In September, Departments will indicate the elective subjects which the department intends to offer in the following year.

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.

Chemical Engineering Subjects

CHEE11 INDUSTRIAL PROCESS PRINCIPLES 3cp


Wall, T.F.

Industrial Process Principles Notes (Department of Chemical Engineering)

CHEE12 INTRODUCTION TO CHEMICAL 6cp ENGINEERING


Coulson, J.M. and Richardson, J.F.

Chemical Engineering Vol.1 SI edn (Pergamon 1977) Introduction to Chemical Engineering Notes (Department of Chemical Engineering)

CHEE13 CHEMICAL AND MANUFACTURING 6cp PROCESSES

An introduction to the structure and organisation of the chemical and process metallurgical industries in Australia, with reference to the world scene. Descriptors 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 member of industrial plants illustrative of the course material, and preparation of process flow diagrams, to Australian Standards requirements.
SECTION EIGHT  
CHEMICAL ENGINEERING SUBJECT DESCRIPTIONS

Text
Austin, G.T.  

CHEME21  TRANSFER PROCESSES 1  


CHEME22  TRANSFER PROCESSES 2  


CHEM231  CHEMICAL ENGINEERING COMPUTATIONS  
Development of a student's ability to write and understand computer programmes that use numerical analysis techniques to solve problems in engineering. The main emphasis is on efficient computing methods. Topics include numerical solutions of ordinary differential equations including stability, convergence criteria, "wild" equation and boundary value problems. Numerical solution of partial differential equations. Explicit and implicit methods of computation; solution of elliptic equations by the grid, iterative and relaxation methods. Solution of hyperbolic equations by the grid method. Solution of parabolic equations by explicit, implicit methods. Microcomputer applications in Chemical Engineering.

Text
Chapra, S.C. and Canale, R.P.  

CHEME23  CHEMICAL ENGINEERING 6cp  

CHEM241  DESIGN PRINCIPLES  

Materials: Materials of construction for process equipment in chemical industry. Use and limitations of various metals, plastics and ceramics.

Text
SAAC Code  
*Engineering Drawing Practice* (AS C21-1982)

SAAC Code  
*Unfired Pressure Vessels* (AS 1210-1989)

Gerome, W.  
*Steel Designers Handbook* (NSW University Press 1984)

CHEM242  CHEMICAL ENGINEERING COMPUTATIONS  
CHEEM262  TRANSFER PROCESSES 1  
HEAT AND MASS TRANSFER: A UNIFIED TREATMENT OF BASIC CONCEPTS OF HEAT AND MASS TRANSFER. CONCEPTS OF FLUX, DRIVING FORCE, DIFFUSIVITY AND CONDUCTIVITY; RATE EQUATIONS. DIMENSIONAL ANALYSIS. HEAT TRANSFER BY CONVECTION, CONDUCTION AND RADIATION. CONVEXTIVE HEAT TRANSFER COEFFICIENTS. RADIATIVE HEAT TRANSFER. MASS TRANSFER BY DIFFUSION AND CONVECTION. MASS TRANSFER COEFFICIENTS. CORRELATION OF TRANSFER COEFFICIENTS. FILM THEORY; PENETRATION THEORY; VAPOUR-LIQUID EQUILIBRIUM. HEAT EXCHANGER DESIGN. EQUATIONS FOR HEAT TRANSFER SURFACE. CO- AND COUNTER-CURRENT ARRANGEMENTS. EVAPORATION AND BOILING.

FLUIDS: ENERGY SOURCES AND USES. FLUIDS AND COMBUSTION EQUIPMENT. COAL PROPERTIES AND POTENTIAL USE. COBBLING COALS AND COKE MAKING. COMBUSTION MECHANISMS. HEAT TRANSFER IN FURNACES.

CHEM251  MODELLING OF PROCESSES  
AN INTRODUCTION TO MATHEMATICAL MODELLING AND THE UNREHEARD STANCE BEHAVIOUR OF CHEMICAL PLANT AND PROCESSES. REVISION OF LAWS OF TRANSFORMATIONS, TRANSFER FUNCTION CONCEPT, UNSTEADY STATE MATERIALS AND ENERGY BALANCES AS A TECHNIQUE FOR SYSTEM MODELLING. FIRST ORDER SYSTEMS, SECOND ORDER SYSTEMS, RESPONSE TO DISRUPTIONS-MODELLING OF SELECTED PROCESSES; RESPONSE OF SEPARATION ELEMENTS. INTRODUCTION TO THE PRINCIPLES OF CONTROL.

Text
Stephanopoulos, G.  
*Chemical Process Control* (Prentice-Hall 1984)

CHEM261  PROJECT ENGINEERING AND MANAGEMENT  
PROJECT ENGINEERING: THE TECHNICAL AND ADMINISTRATIVE ASPECTS LEADING TO THE SUCCESSFUL COMMISSIONING OF A CHEMICAL PLANT, INCLUDING SITE AND PROCESS SELECTION, CONTRACTING, CONSTRUCTION AND COMMISSIONING. NETWORK ANALYSIS. PROCESS AND STORAGE VESSELS, PUMPS AND PIPES. PLANT UTILITIES, INCLUDING COMPRESSED AIR, ELECTRICITY SUPPLY AND ELECTRICAL DRIVE SYSTEMS. PROCESS INSTRUMENTATION, CONCEPTS AND HARDWARE.

MANAGEMENT PRINCIPLES: MANAGEMENT STRUCTURE, INDUSTRIAL RELATIONS, LEGAL AND SOCIOLOGICAL CONSIDERATIONS. ESTIMATION OF CAPITAL AND OPERATING COSTS FOR PROCESS PLANTS, BREAK-EVEN ANALYSIS, PROJECT PROFITABILITY, DISCOUNTING TECHNIQUES, ECONOMIC EVALUATION OF ALTERNATIVES, RISK ANALYSIS. BASIC PROCEDURES FOR COST ACCOUNTING, BUDGETING, PURCHASING AND INVENTORY CONTROL.

SITE INSPECTIONS OF APPROPRIATE INDUSTRIES.

Text
Peters, M.S. and Timmerhaus, K.D.  

CHEM271  SAFETY AND ENVIRONMENT  
A GENERAL INTRODUCTION TO THE INHERENT HAZARDS OF THE MATERIALS AND PROCESSES RELATVE TO THE CHEMICAL INDUSTRY. ELEMENTS OF HAZARD ANALYSIS AND OPTIMIZATION. ASPECTS OF INDOUSTRY TOXICOLOGY. SOURCES, TYPES AND EFFECTS OF EXPLOSIONS. LEGAL, ENVIRONMENTAL AND ECLOGICAL CONSIDERATIONS IN THE DISPOSAL OF INDUSTRIAL WASTES.

Text
Holman, J.P.  

CHEM281  ELECTROCHEMISTRY AND CORROSION  
INTRODUCTORY ELECTROCHEMISTRY. POTENTIAL AND POTENTIAL DIFFERENCES AT INTERFACES. CHARGED INTERFACES, AND CHARGE TRANSFER BETWEEN PHASES. ELECTROCHEMICAL DIFFUSION CONTROL. CORROSION AND PASSIVATION. EVAUATION AND POURBAIX DIAGRAMS. CATHODIC AND ANODIC PROTECTION. TECHNIQUES OF CORROSION INHIBITION. STRESS CORROSION CRACKING.

Text
Bird R.B., Stewart W.E. et al.  
*Transport Phenomena* (Wiley 1960)

CHEM291  SURFACE CHEMISTRY  
PROPERTIES OF MINERALS AND THEIR RELATION TO MINERALOGICAL CLASSIFICATION. TECHNIQUES OF SEPARATION BASED ON VOLUME PROPERTIES (GRAVITY, ELECTROSTATIC, MAGNETIC) AND SURFACE PROPERTIES (CHARGE, HYDROPHOBICITY). FLOTTATION. ACTION OF COLLOIDION, MODIFIERS, FLOTATION. ELECTROGEOGRAPHIC PHENOMENA. OXIDE AND SULPHIDE FLOTATION. FLOTTATION AND AGGREGATION.

Text
Shaw, D.C.  
*Introduction to Colloid and Surface Chemistry* (Butterworth 1980)

CHEM301  BIOTECHNOLOGY  
PROPERTIES OF IMPORTANT MICRO-Organisms; THERMODYNAMIC AND STOICHIOMETRIC ASPECTS OF MICROBIAL METABOLISM AND ACTIVITY. PRODUCT PATHWAYS AND ENZYMES. REACTORS AND FLOW BEHAVIOUR OF FERMENTATION FLUIDS; TRANSFER PROCESSES AND UNIT OPERATIONS FOR PRODUCT RECOVERY; WITH EXAMPLES FROM PHARMACEUTICAL, AGRICULTURE, FOOD, ENERGY AND LIQUID EFFLUENT CONTROL.

Text
Peters, M.S. and Timmerhaus, K.D.  

CHEM311  MINERAL PROCESSING  
PROPERTIES AND HANDLING OF PARTICULAR SOLIDS: SIZE ANALYSIS, SCREENING, SIZE SELECTION IN PROCESS DESIGN, SEPARATION AND BLENDING OF SOLIDS AND LIQUIDS. MOTION OF PARTICLES IN A FLUID. TERMINAL VELOCITY DRAG COEFFICIENTS, SEDIMENTATION AND FILTRATION. CLASSIFICATION AND ELUTRICATION. FLUIDIZATION; PNEUMATIC AND...
hydraulic transport. Properties and handling of particulate solids.
Size analysis, screening. Size reduction, comminution.

CHE3356 PROCESS SYNTHESIS 3cp
The utilisation of computer software packages for complete flowsheet development and analysis of process synthesis to the solution of complex chemical engineering design problems.

CHE337 FUEL TECHNOLOGY I 3cp
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.

CHEE338 PROCESS METALLURGY 1 3cp

CHEE3372 SEPARATION PROCESSES 6cp
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, hydraulic design of mass transfer equipment; stage efficiency, energy requirements; analysis of multi-component separation processes including azeotropic, extractive and complex distillation.

Text
McCabe, W.L., and Smith, J.C.
Unit Operations of Chemical Engineering (McGraw-Hill 1985)

CHEE381 ENGINEERING APPLICATION 3cp LABORATORY
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.

CHEE332 LABORATORY 3 3cp
A number of open-ended investigations illustrating Year III lecture topics, including experiments on instrumentation and control of process plant.

CHEE383 LABORATORY 4 3cp
A number of open-ended investigations illustrating Year III lecture topics, including experiments on instrumentation and control of process plant.

CHEE401 SPECIAL TOPIC 3cp
A topic in Chemical Engineering to be approved by Head of Department.

CHEE421 PROCESS CONTROL AND INSTRUMENTATION 6cp

Text
Stephens, G.
Chemical Process Control (Prentice-Hall 1984)

CHEE431 REACTION ENGINEERING 3cp

Text
Levenspiel, O
Chemical Reaction Engineering 2nd edn (Wiley 1972)

CHEE451 SURFACE CHEMISTRY 2 3cp
Selected topics in surface chemistry relevant to chemical engineering and mineral processing.

CHEE452 MINERAL PROCESSES 2 3cp
A treatment of unit operations of mineral processing.

CHEE453 PROCESS OPTIMIZATION 3cp
Introduction to stochastic processes and their simulation. Analytical and numerical techniques for optimization of single and multiple variable problems. Development of simple flowsheets, process synthesis, to emphasize optimization possibilities or alternatives.

Text
Taha, H.A.
Operations Research (McMillan 1987)
Chemistry Subjects

CHEM101 CHEMISTRY 101 6cp
General Chemistry: (approx.15 lectures) Revision of basic chemical principles. Introduction to atomic and molecular concepts. Simple ionic and covalent bonding models.

Organic Chemistry: (approx.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.

See Faculty of Science and Mathematics Handbook for further information.

Texts
Lehman, J.W. Molecular Model Set for Organic Chemistry (Allyn & Bacon, 1984)

CHEM102 CHEMISTRY 102 6cp

Inorganic Chemistry: (approx.13 lectures) Inorganic solids and their structures. Simple molecular orbital theory and bonding in metals. Transition metal chemistry; coordination compounds.

Physical Chemistry: (approx. 26 lectures) Chemical equilibria; thermodynamics; electrochemistry; chemical kinetics.

See Faculty of Science and Mathematics Handbook for further information.

Text

CHEM203 ORGANIC CHEMISTRY 6cp


See Faculty of Science and Mathematics Handbook for further information.

Texts

Civil Engineering Subjects

CIVL111 MECHANICS AND STRUCTURES 3cp
Introduction to the behaviour of structures. Statics; forces as vectors, resultant and equilibrium into two dimensions. Beams, trusses; method of joints, method of sections. Static determinacy. Compatibility; properties of sections, stress, strain, Mohr’s circle. Co-linearity, stability, Euler’s formula.

Texts
Atkins, K.J. et al. Mechanics and Structures (Science Press)
Atkins, K.J. Teaching Programmes in Mechanics and Structures (Science Press)
Atkins, K.J. and Darvall, P. Mechanics and Structures: Worked Problems (Science Press)

CIVL131 FLUID MECHANICS I 3cp

Texts

CIVL191 INDUSTRIAL EXPERIENCE 3cp

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 evaluations 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 INDUSTRIAL EXPERIENCE 3cp

CIVL193 INDUSTRIAL EXPERIENCE 3cp

CIVL194 INDUSTRIAL EXPERIENCE 3cp

Civil Engineering Subjects

CIVL222 MATERIALS 2 3cp
Fundamentals of concrete technology; component materials, properties of fibre, and hardened concrete, mix design, manufacturing and field control. Laboratory testing of materials.

Texts
Fundamentals of Concrete Technology (Course Notes).

CIVL223 MATERIALS 3 3cp
Properties and behaviour of brick, masonry, timber and bituminous materials. Theoretical background and laboratory tests of elastic and inelastic properties, creep, hardness and fracture of metals and timber. Laboratory testing of materials.

CIVL223 FLUID MECHANICS 2 3cp

CIVL233 FLUID MECHANICS 3 3cp

CIVL241 ENVIRONMENTAL SCIENCE 3cp

Text

CIVL251 SYSTEMS 3cp
General introduction to the systems approach. Economics of large engineering projects in the public domain. Mathematical modelling, mathematical programming techniques, networks, CPM. Examples in civil engineering practice.

CIVL271 TRANSPORTATION ENGINEERING 6cp
Elements of regional planning, land-use/transport interactions; transportation modes and system characteristics; transportation demand estimates, data collection; traffic engineering; highway engineering; driver, vehicle and road characteristics; road geometrics; road construction, drainage, pavements, maintenance.
CIVL314 THEORY OF STRUCTURES 2 3cp

CIVL315 STRESS ANALYSIS 3cp

Text
Timoshenko, S. and Goodier, N. Theory of Elasticity (McGraw-Hill)

CIVL316 STRUCTURAL DESIGN 1 6cp
Loads and loading combinations. The design process, conceptual design. The design of reinforced concrete members and connections.

Texts

CIVL317 STRUCTURAL DESIGN 2 6cp
The design of steel members, composite beams, and connections.

Texts
Hot Rolled Carbon Steel Sections and Plates (B.H.P. Co. Ltd.)
Gorenc, B.J. and Taiton, R. Steel Designers' Handbook (N.S.W. I.P.) Relevant SAA Codes.

CIVL318 SOIL MECHANICS 1 3cp
Index properties, classification of soils; permeability, capillarity, seepage and flow nets; stress states in soils. Settlement and consolidation; compaction.

CIVL326 SOIL MECHANICS 2 3cp
Shear strength and failure criteria; stability of retaining walls, surface footings and slopes.

CIVL327 CONCRETE AND METALS TECHNOLOGY 3cp

CIVL330 OPEN CHANNEL HYDRAULICS 3cp

CIVL342 HYDROLOGY 3cp

CIVL352 MANAGEMENT 3cp
Management: construction company failures and the need for efficient management; principles of management, management functions and techniques; nature and type of organisational structures. Industrial relations and law. Administration: costing, estimating, engineering contracts; drawings and specifications; tendering. Project Planning and Control planning; constructing and analysing networks; resource levelling; cost minimization; presentation of information; control.

CIVL360 STATISTICAL METHODS 3cp

CIVL362 FINITE ELEMENT METHODS 3cp
Introduction to the finite element method. Emphasis on the generality of the technique. Topics covered include Lagrange interpolation, numerical integration, solution to linear equations, stress elements, beam elements, 2-dimensional solid elements and the solution of field problems. Theory is reinforced by programming assignments which use the NAG finite element library.

CIVL410 DYNAMICS AND STABILITY OF STRUCTURES 3cp

CIVL418 THEORY OF STRUCTURES 3 3cp

CIVL419 MASONRY AND TIMBER DESIGN 3cp
The properties and behaviour of masonry and its components. The design of masonry structures including recent developments in high rise construction. The properties and behaviour of timber. The design of timber structures.

CIVL428 GEOTECHNICAL ENGINEERING 3cp
Site investigation, design of shallow foundations, piled foundations, soil improvement, designs of embankments, cuttings, earth dams, buried pipes.

Text

CIVL429 ROCK MECHANICS 3cp
Index properties and classification, rock strength and failure criteria, deformation of rocks, in situ stress, planes of weakness, foundations on rock, underground openings, rock slopes.

CIVL435 RIVER AND COASTAL ENGINEERING 3cp

CIVL443 WATER RESOURCES ENGINEERING 3cp
This course considers several areas of applied water resources engineering emphasizing synthesis of basic principles and design. Urban drainage: layout and design, runoff routing, recontouring. Flood management: mitigation schemes. Water supply systems: objectives, economics, stochastic behaviour, design, operation, modelling.

CIVL453 CIVIL ENGINEERING DESIGN 1 9cp
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.

CIVL454 CIVIL ENGINEERING DESIGN 2 9cp
Further examples as per CIVL453.
Commerce Subjects

COMM101 FINANCIAL ACCOUNTING FUNDAMENTALS

Entry to this subject is restricted to students meeting the entry requirements for the BComm degree programme.

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.

Additional Commerce subjects are described in the Faculty of Economics and Commerce Handbooks.

Computer Science Subjects

COMP101 COMPUTER SCIENCE 1

12cp

Entry to this subject by students other than those enrolled in the BCompSc, BE(Computer Engineering) and BInfSc degree programmes is limited by quota. See the Faculty Secretary 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 Pascal and a functional programming language.

COMP102 INTRODUCTION TO PROGRAMMING

3cp

This subject is not available to students enrolled in computer science degree or diploma courses. Completion of this subject meets the programming competence requirement for admission to the postgraduate DipCompSc and DipComp programmes.

An introduction to structured programming and the design of algorithms using the high level language Pascal. The formal definition of high level languages and basic data structures will also be introduced.

COMP201 ADVANCED DATA STRUCTURES

3cp

Basic data structures are investigated. Topics covered will include a review of elementary data structures, an introduction to the concept of an abstract data type and the implementation of data types selected from lists, stacks, queues, trees, graphs and sets.

COMP202 COMPUTER ARCHITECTURE

3cp

Provides basic introduction to the logical internal structure of computers and the implementation of computer arithmetic and number handling systems.

COMP203 ASSEMBLY LANGUAGE

3cp

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

3cp

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.
### Economics Subjects

#### ECON101 ECONOMICS I

The course is designed to introduce the student to the principles of economics. While emphasis through the course is on the theoretical underpinnings of economics the concepts afford significant insights into contemporary problems. The theoretical concepts developed will be used to address contemporary issues and problems. The first semester students will examine the principles of Microeconomics and their applications. Microeconomics is concerned with the rules of rationality for decisions made by individuals who wish to maximise their wellbeing, and the impact these decisions have upon the allocation of resources through an economy or society. Emphasis will be placed on contrasting theoretical conclusions with real-world proofs. In the second semester students will be concerned with Macroeconomics. It will involve a study of the relationship between aggregates such as consumption, investment, employment, exchange rates, inflation and growth. Basic theoretical analysis will be used to explain policy alternatives and some of the problems involved in making appropriate policy decisions. The course will include a discussion of areas of theoretical controversy and provide some explanation as to why economists can advocate incompatible "solutions" to the same problem.

**Text**


#### ECON371 PRINCIPLES OF ECONOMICS

An introduction to the fundamental theories 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 underdeveloped 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.

*Additional Economics subjects are described in the Faculty of Economics and Commerce Handbook.*
ELECG0 ELECTRONICS 5 6cp
An introductory subject on electronic devices and circuit techniques.

Text
Mitchell, F.H. and Mitchell, F.H.
Introduction to Electronics Design (Prentice-Hall 1988)

ELEC230 ELECTRONICS 2 12cp
The fundamental concepts of electronic engineering are expounded.
The subject builds on and expands the first year circuits topics.
The student is also introduced to electro-mechanical energy conversion principles which form the basis of future power subjects.
A broad outline of the subject content is as follows:
- Review of AC circuit theory
- Operational amplifiers and feedback
- Phase shift and Wien bridge oscillators
- Active filters
- Frequency response of filters
- Digital electronics
- Logic families
- Microprocessors

Text
K. S. Barnaby and F. C. Gardner
Digital Electronics and Microprocessors (Prentice-Hall 1983)

ELEC230 ELECTRONICS 2 12cp
Introduction to power electronic transmission systems and power utilisation by electrical machines. Fundamental concepts associated with rotating machines. Machine construction. Machine windings and their parameters. Detailed steady state analysis and performance of d.c. machines and induction machines. Structure of electrical power systems. Power supplies. d.c. sources, synchronous machines; the synchronous machine; transmission lines; surge phenomena, switchgear, watt and VAR flow control; substations and control rooms; distribution systems; reliability. The subject comprises a series of lectures, tutorials and laboratory sessions.

Texts
M. D. Green
Electric Power Systems (Prentice-Hall 1986)

ELEC230 ELECTRONICS 2 12cp

Test
Mitchell, F.H. and Mitchell, F.H.
Introduction to Electronics Design (Prentice-Hall 1988)

ELEC230 ELECTRONICS 2 12cp
Attenuation and surface impedance. Free space and guided wave propagation including coaxial, waveguide and strip line configurations. Electromagnetic sources and propagation, radiation and elementary antenna theory. Techniques for obtaining the surface current distribution on an arbitrary antenna by analytical and computational methods. Solutions of potential equations, near and far field distributions. Characteristics of common antennas configurations including primary sources (wire antennas, antenna arrays and secondary sources) Ground wave and ionospheric propagation. The subject comprises a series of lectures, laboratories and tutorials.

Test
Stremler, P.G.
Introduction to Communications Systems 2nd edition (Addison Wesley 1982)
ELEC450 ADVANCED COMMUNICATIONS 6cp
This subject consists of lectures, laboratories and assignments, with the emphasis on the implementation and realisation of relevant digital processes and covers three general areas.


ELEC460 COMPUTER SOFTWARE 6cp
A subject consisting primarily of practical work on a large software development project.

ELEC470 COMPUTERSYSTEMS 6cp
A subject consisting of a series of lectures, tutorials and laboratory work covering the areas of advanced computer architecture and VLSI.

ELEC480 ELECTRICAL ENGINEERING PROJECT 18cp
The final year project for Electrical Engineering students. Usually consisting of literature survey, and review, analytical and/or experimental investigation of an electrical engineering problem. Two copies of the Project Report are required. Each student will prepare a seminar on their project work. A series of seminars is also given by invited guest speakers. Weekly attendance at seminars is compulsory.

ELEC485 COMPUTER ENGINEERING PROJECT 18cp
The final year project for Computer Engineering students. Usually consisting of literature survey, and review, analytical and/or experimental investigation of a computer engineering problem. Two copies of the Project Report are required. Each student will prepare a seminar on their project work. A series of seminars is also given by invited guest speakers. Weekly attendance at seminars is compulsory.

ELEC543 OPTIMIZATION TECHNIQUES 3cp

Text

ELEC544 LINEAR SYSTEMS THEORY 3cp
Advanced treatment of multivariable linear systems from frequency domain, matrix fraction, state-space and/or geometric viewpoints.

ELEC545 NONLINEAR SYSTEMS ANALYSIS 3cp
Basic techniques in nonlinear systems analysis: Lyapunov stability theory, Gronwall Lemma, input-output methods, oscillations, singular perturbations.

Text

ELEC546 TOPICS IN SYSTEM DESIGN 1 3cp
A topic oriented to students concerned with advanced design rather than basic research.

ELEC547 TOPICS IN SYSTEM DESIGN 2 3cp
A topic oriented to students concerned with advanced design rather than basic research.

ELEC552 ADVANCED DIGITAL SIGNAL PROCESSING 3cp
Advanced techniques in recursive filter design: bandwidth, ambiguity functions, two-dimensional imaging, array processing.

ELEC571 COMPUTER AND ELECTRONICS SEMINAR 1 3cp
ELEC572 COMPUTER AND ELECTRONICS SEMINAR 2 3cp
ELEC573 COMPUTER AND ELECTRONICS SEMINAR 3 3cp
Each subject consists of a series of seminars for research postgraduate students. Each student will prepare a seminar on research literature.

ELEC581 PROJECT 18cp
Available to M.Eng.Science students only.

ELEC582 PROJECT 24cp
Available to M.Eng.Science students only.

ELEC591 SYSTEMS AND CONTROL SEMINAR 1 3cp
ELEC592 SYSTEMS AND CONTROL SEMINAR 2 3cp
ELEC593 SYSTEMS AND CONTROL SEMINAR 3 3cp
Each subject consists of a series of seminars for research postgraduate students. Each student will prepare a seminar on research literature.

ELEC641 ADAPTIVE CONTROL 3cp

Text

ELEC642 ESTIMATION AND SYSTEM IDENTIFICATION 3cp

Text

ELEC643 NONLINEAR CONTROL 3cp
Emphasises modern theory for synthesis of controllers for nonlinear multivariable systems.

Text

ELEC654 ADVANCED TOPICS IN CONTROL 3cp
Variable content emphasizing recent developments.

ELEC655 ADVANCED TOPICS IN SYSTEMS THEORY 1 3cp
Variable content emphasizing recent developments.

ELEC656 ADVANCED TOPICS IN SYSTEMS THEORY 2 3cp
Variable content emphasizing recent developments.

ELEC661 COMPUTER NETWORKS 3cp
Network architectures and topologies. Local network and examples. Distributed operating systems.

Text
Geology Subject

Additional Geology subjects are described in the Faculty of Science and Mathematics Handbook.

Mathematics Subjects

Mathematics 101 6cp

Mathematics 102 6cp

Mathematics 103 6cp

Law Subjects

Law 101 6cp
- Foundational legal concepts, the Act of Parliament. The foundation of the processes of law-making through judicial decisions, and primary and delegated legislation are considered in detail.

Suggested Preliminary Reading
- Gifford, D.J. & K.H. "Our Legal System 2nd Eds (Law Book Co. 1983)
- Nettheim, G. "Understanding Law 2nd Eds (Butterworths 1988)

Law 201 3cp

Law 202 3cp
- 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
- Hallman, F. "Legal Aspects of Boundary Surveying as apply in New South Wales" (Inst. of Surveyors Aust. 1973)
- Willis "Notes on Survey Investigations (NSW Government Printer)"

Additional Law subjects are described in the Faculty of Economics and Commerce Handbook.
MECH111 ENGINEERING DRAWING 3cp
A study in communication methods and visualisation by pictorial means. Review of drafting types. Methods of projection including orthographic, axonometric and perspective in both structured and freehand modes. Sectioning, dimensioning and use of standards and symbolism in engineering pictorial communication. Developments, true shapes and intersection of entities.

Text

MECH121 MATERIALS 1 3cp
The course provides a general introduction to materials of engineering significance and to the relationships which exist between structures, properties and applications. The detailed treatment of various aspects is left to the latter stages of the degree programme. The following sections are given approximately equal amounts of time and emphasis. Atomic bonding; atomic orthographic, axonometric and perspective in both structured and

MECH122 MATERIALS 2 3cp
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.

Text

MECH123 MECHANICAL ENGINEERING DESIGN 1 9cp

Text

MECH124 EXPERIMENTAL METHODS 1 3cp
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. Problems of correct interpretation of experimental data and basic principles of error analysis are discussed. Proficiency in technical report writing is emphasized.

MECH125 ENGINEERING COMPUTATIONS 3cp
This course is concerned with developing a student's ability to write computer programmes that utilise numerical analysis techniques to solve problems in the engineering field. Some discussion of the theories behind the numerical analysis techniques is given but the main emphasis is on computing. The programming work of Engineering Computations I is extended to include some advanced FORTRAN programming techniques, the use of graph-plotting routines and the use of computer libraries such as the MAG 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 solutions of ordinary differential equations and partial differential equations.

Text
Handbook for VAX/VMS (The University of Newcastle Computing Centre)

MECH126 EXPERIMENTAL METHODS 2 3cp
Selected engineering laboratory experiments designed to extend the concepts of experimental procedures and to complement formal subject matter in the course.

MECH131 ENGINEERING MECHANICS 1 3cp

MECH132 DYNAMICS 6cp

Text

MECH134 MECHANICAL ENGINEERING DESIGN 2 9cp

Text
Burr, A.H. Mechanical Analysis and Design (Blawurt 1983)

MECH135 COMPUTER AIDED DESIGN 3cp
The CAD/CAM environment. Representation of basic geometric entities; points, line surfaces. Drafting, control of work views and display systems; dialogue, bill of materials, templates and patterns. 3-D geometry; projections, auxiliary views, coordinate transformations, sections and solid properties. Part representation and generation; NC machining paths and part program generation. Interface to analysis packages.

MECH136 FINITE ELEMENT METHODS 1 3cp
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
MECH105 MECHANICAL ENGINEERING DESIGN 3cp
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 a systematic approach to material selection.

MECH141 MAINTENANCE ENGINEERING 3cp

MECH142 COMPOSITES IN ENGINEERING 3cp
Strengthening principles of composites and fibre reinforcement. Engineering properties and forms available of constituent materials (fibres and matrix material). Strength, fracture, fatigue and design techniques. Introduction to manufacturing processes.

MECH143 ROBOTICS 3cp
Basic concepts, classification of robotic systems, control systems, kinematic analysis and co-ordinate transformations, trajectory interpolation, programming, applications, sensors and intelligent robots, computer integrated manufacturing systems.

MECH144 FLUID MECHANICS 3cp
Lecturers and laboratory work dealing with fluid flow. One-dimensional compressible flow. Fluid dynamic stability. Elements of turbulent flows. Turbulent flows in both the laboratory and atmosphere.

MECH145 THERMODYNAMICS 3cp
Thermodynamic relations; the Maxwell relations; general equations for entropy, internal energy and entropy; compressibility factor; equations of state; generalised charts for entropy and entropy. Availability concepts and applications. Thermodynamics of irreversible processes. Applications of statistical thermodynamics. Direct energy conversion.
MANAGEMENT SUBJECT DESCRIPTIONS

PHIL101 INTRODUCTION TO PHILOSOPHY 12cp
First Semester: Some of Plato’s dialogues will be read, and the ethical, political and metaphysical questions raised by them will be systematically expounded (1 hour per week). A segment on knowledge and reality examines some questions about belief and knowledge, the mind/body relationship, meaning, and skepticism (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 reasoning as an everyday practice (1 hour per week).
Second Semester: Book I of Hobbes’s classic Leviathan will be read; it will be explained and expounded in detail to bring out the Hobbesian world view systematically, the world view of liberalism that underlies western democracies (1 hour per week). A segment on morality discusses the nature of justice and some views on free will and on the basis of morality (1 hour per week). A further segment on critical reasoning discusses syllogistic reasoning, fallacies and inductive arguments (1 hours per week).

PHIL392 TECHNOLOGY AND HUMAN VALUES 2
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 technological decision. Each team will produce a report of a quality aimed at management/ministerial level. Each team will deal with the reduction of logical formulae into clauses form to enable their expression in PROLOG.

PHIL191 TECHNOLOGY AND HUMAN VALUES 1
A course of lectures and discussions focusing on the economic, political, social and ethical issues that arise in technological design decisions. The course is presented in two parallel streams. Strand A is based on an examination of energy policy. This example of design analysis and decision making is used to develop an awareness of (i) systems design and how non-technical factors enter design decisions and (ii) a systematic approach to public policy making. Strand B complements Strand A by introducing a range of additional topics concerned with the philosophy, nature and social assessment and regulation of technology.

TEXTS

Strand A
Commissar, B. The Poverty of Power (Bantam 1977)
Hooker, C.A. et al. Energy and the Quality of Life (University of Toronto Press 1981)
Texts (Strand B)
Brown, L.R. The Twenty Ninth Day (W. W. Norton 1978)
Schumacher, E.F. Small is Beautiful (Abacus 1974)
Teich, L.H. Technology and Man’s Future (St. Martin’s Press 1977)

PHIL422 BASIC SYMBOLIC LOGIC 3cp
A basic introduction to sentential and predicate calculus, including theorems, interpretation, satisfiability, validity and proof construction. Part of the course will deal with the reduction of logical formulae into clauses form to enable their expression in PROLOG.

Text
Newton-Smith, W.H. Logic: An Introductory Course (Routledge)

PHIL391 TECHNOLOGY AND HUMAN VALUES 6cp
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 streams. Strand A is based on an examination of energy policy. This example of design analysis and decision making is used to develop an awareness of (i) systems design and how non-technical factors enter design decisions and (ii) a systematic approach to public policy making. Strand B complements Strand A by introducing a range of additional topics concerned with the philosophy, nature and social assessment and regulation of technology.

TEXTS

Strand A
Commissar, B. The Poverty of Power (Bantam 1977)
Hooker, C.A. et al. Energy and the Quality of Life (University of Toronto Press 1981)
Texts (Strand B)
Brown, L.R. The Twenty Ninth Day (W. W. Norton 1978)
Schumacher, E.F. Small is Beautiful (Abacus 1974)
Teich, L.H. Technology and Man’s Future (St. Martin’s Press 1977)

PHIL422 BASIC SYMBOLIC LOGIC 3cp
A basic introduction to sentential and predicate calculus, including theorems, interpretation, satisfiability, validity and proof construction. Part of the course will deal with the reduction of logical formulae into clauses form to enable their expression in PROLOG.

Text
Newton-Smith, W.H. Logic: An Introductory Course (Routledge)
PHYSICS 101

This is an introductory course in physics concentrating primarily on the core topics of the HSC physics syllabus. The lecture course, each of 13 lectures consists of three main strands: Mechanics, Electromagnetism, Waves, optics and thermal physics. The subject includes 3 hrs/week of laboratory and tutorial work.

See Faculty of Science and Mathematics Handbook for further information.

Texts
Serway and Faughn

PHYSICS 102

This lecture course consists of three principal strands, each of 13 lectures, being: Mechanics; Electromagnetism; Thermal, nuclear and quantum physics. The subject includes 3 hrs/week of laboratory and tutorial work.

See Faculty of Science and Mathematics Handbook for further information.

Statistics Subjects

STAT203 QUEUES AND SIMULATION 3cp

Queues. Random number generation. Simulation, including the use of SIMSCRIPT.

STAT205 ENGINEERING STATISTICS 3cp


Additional Statistics subjects are described in the Faculty of Science and Mathematics Handbook.

PHYSICS 103

This lecture course consists of three principal strands, each of 13 lectures: Advanced mechanics and electromagnetism; Waves and optics; Thermal, atomic, and quantum physics. The strands will be matched to the preceding strands of PHYSICS 102, continuing with the rigorous development of basic physics. The subject also includes 3 hours per week associated with laboratory and tutorial work.

See Faculty of Science and Mathematics Handbook for further information.

PHYSICS 100 QUANTUM MECHANICS AND ELECTROMAGNETISM 6cp

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

Additional Physics subjects are described in the Faculty of Science and Mathematics Handbook.
law titles surveys and searches. Identification surveys. Field
records
Text
Texts
SURV393 LAND BOUNDARY DEFINITION 6cp
Cadastral surveys, N.S.W. Surveying Law, Tenures 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
Hallman, F.
Legal Aspects of Boundary Surveying as Apply in NSW
(Inst. of Surveyors NSW 1973)
Willis, R.W.
Notes on Survey Investigations (The Land Titles Office)
SURV417 INDUSTRIAL AND OTHER
SURVEYING
Review of statistics. Mechanical principles of instrument design,
optical tooling in industry, pointing accuracy theory. Construction
project surveys, establishing control net and monitoring
construction, such as: ground deformation surveys.
Texts
Richardus, P.
Project Surveying (North Holland)
Manual of the N.S.W. Integrated Survey Grid (NSW
Department of Lands 1976)
SURV418 CONTROL NETWORKS 3cp
Analysis of field procedures and design of surveys. Survey
control for subdivision projects, integrated surveys.
Texts
Richardus, P.
Project Surveying (North Holland)
Manual of the N.S.W. Integrated Survey Grid (NSW
Department of Lands 1976)
SURV441 ASTRONOMY 6cp
The celestial sphere and astronomical triangle — definitions,
conventions and time. Latitude by circum-meridian methods.
Longitude by ex-meridian methods. Azimuth by circum-
elongation, circumpolar and sun observations. Position line
methods.
Texts
Bennett, G.G. and Freidich, J.G.
Field Astronomy for Surveyors (UNSWP 1979)
Mackie, J.B.
Astronomy for Surveyors 8th edn (Giffin 1978)
SURV452 GEODESY 2 3cp
Least squares adjustment of control surveys; variance/covariance
matrix, variance factor and weight coefficient matrix, elementary
statistical testing of observations and adjusted values. Relationship
between geoid and ellipsoid, astro-geodetic levelling, ellipsoidal
elevations, mean sea level and the geoid-gravity and its use
in geodesy, methods for establishing a world geodetic system,
Precise levelling.
Texts
Torge, W.
Geodesy (de Gruyter)
Mikhail, E.M.
Observations and Least Squares (JBP)
SURV462 PHOTOGRAMMETRY 2 3cp
Photogrammetric orientation. Design: principles and practical
application of exact and approximate restitution instruments.
Flight and project planning — aerial mapping — aerial
triangulation of strips.
Text
Wolf, P.R.
Elements of Photogrammetry (McGraw-Hill 1974)
SURV463 ADVANCED CARTOGRAPHY 3cp
Cadastral systems. Land information systems. Evolution of the
N.S.W. cadastre. Mapping — methods of preparing and
reproducing line maps and other map products. Principles of
automatic cartographic procedures, review of equipment examples
of automated mapping.
SURV472 LAND VALUATION 6cp
General principles of urban and rural land valuation — unimproved
and improved capital values — valuation of leasehold and
freehold land — subdivisional value of land — valuation of
buildings — relevant Acts and Regulations — N.S.W. Land and
Valuation Court proceedings and decisions.
Texts
Hornby, D.
Appraisal One (Jolyon 1976)
Murray, J.I.N.
Principles and Practice of Land Valuation (Commonwealth
Inst. of Valuers 1974)
SURV473 TOWN PLANNING 6cp
Review of historical planning concepts. Modern approaches to
town planning including legal aspects. Practical consideration in
subdivision design. Environmental impact considerations.
SURV481 PROJECT 9cp
Either a minor research project involving a literature review and/or
analytical and/or experimental investigation or
a land studies project, involving selection of a site suitable for a
specified purpose, investigation of title, zoning, site survey,
environmental impact study, design for development.
SURV488 SPECIAL TOPIC 3cp
A contemporary topic in surveying approved by the Head of
Department.
SURV499 SPECIAL TOPIC 3cp
A contemporary topic in surveying approved by the Head of
Department.
**SCHEDULE OF SUBJECTS**

**About This Section**
This section contains the details of the subjects offered by the departments of the Faculty of Engineering, also indicates the WAM weighting of the subject.

**Guide to Subject Detail Schedule**
Each subject has been given a unique code (eg CIVL11). 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 usually indicate the sequence of a subject in a stream of subjects or within a course.

The departmental indicators in this Handbook are listed in Section 7.

**Credit Point Value**

The course and subject requirements offered within the University from 1990 require full-time students completing course requirements in minimum time to undertake an annual workload of 48 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 programme. 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 point values is given in the General Course Rules and Information in Section 4.

**Semester Offered**
Subjects may be offered in Semesters 1, 2, both Semester 1 and Semester 2 (ie the subject is repeated) or over a full year.

The indications given in the Schedule are accurate at the time of publication but students should check final arrangements in the University Timetable.

**Prerequisites, Corequisites and Assumed Knowledge**
The schedule lists the prerequisite, corequisite or assumed knowledge requirements of the subjects described in this Handbook.

The meaning of these terms are defined in the relevant degree regulations.

The head of the department offering a subject (indicated by the subject code) may waive the prerequisite, corequisite or assumed knowledge requirements of that subject. Students should obtain any such waiver in writing on the form available from the School Office and submit the completed form attached to any request for variation of programme.

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### Schedule of All Subjects Listed by the Department of Chemical Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject Name</th>
<th>Credit Point Value</th>
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T.B.D. = To be determined

H.D.O. = Head of Department

* Effective subjects. Not all elective subjects will be available in any one year. A list of the elective subjects planned to be offered will be posted on the Departmental Notice Board in September of the previous year but the ability to offer elective subjects will depend on student demand. Students enrolled in elective subjects should check with the relevant Departmental Office in the first week of first semester to ensure that the elective subjects they have chosen will be offered and, if necessary, formally vary their enrolment accordingly.
### SECTION NINE

**SURVEYING COMPUTER NUMBERS**

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<th>Code</th>
<th>Subject Name</th>
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**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. A list of the elective subjects planned to be offered will be posted on the Departmental Notice Board in September of the previous year but the ability to offer elective subjects will depend on student demand. Students enrolled in elective subjects should check with the relevant Departmental Office in the first week of first semester to ensure that the elective subjects they have chosen will be offered and, if necessary, formally vary their enrolment accordingly.
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<th>Code</th>
<th>Subject Name</th>
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### Schedule of All Subjects Listed by the Department of Mechanical Engineering

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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. A list of the elective subjects planned to be offered will be posted on the Departmental Notice Board in September of the previous year but the ability to offer elective subjects will depend on student demand. Students enrolled in elective subjects should check with the relevant Departmental Office in the first week of first semester to ensure that the elective subjects they have chosen will be offered and, if necessary, formally vary their enrolment accordingly.
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*** MATH1025 is expected to be offered in Semester 2 after 1990. MATH1028 is expected to be offered in Semester 1 after 1990. MATH1215 is expected to be offered in Semester 2 after 1990.