

# **Faculty of Science**

**Applied Geology**

**Biology**

**Chemistry**

**Mathematics**

**Physics**

**Queensland University of Technology**

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# Faculty of Science

## **Dean of Faculty:**

R B Gardiner, MA, BSc(Hons), PhD(Edin), CPhys, FInstP, FAIP.

The Faculty of Science consists of:

*Department of Applied Geology*

*Department of Biology*

*Department of Chemistry*

*Department of Mathematics*

*Department of Physics*

Each Department offers major studies at Bachelor's degree level within its area of interest. Courses at Associate Diploma level are conducted for the training of technicians in the areas of Biology and Chemistry, and at Diploma level in Radiography. Specialist training is provided by post-graduate courses in Medical Physics and Analytical Chemistry (at Masters level) and in Quality (at Graduate Diploma level) in collaboration with the Faculties of Business and Engineering.

All Departments within the Faculty offer a Master of Applied Science by Research and Thesis. This degree enables students to pursue a research program, which makes a contribution to a particular aspect of applied science, under the supervision of academic staff.

Departments have established strong links with professional bodies, employers and allied groups on matters pertaining to the Institute's objectives. These interactions provide valuable feedback to Departments on courses, and foster the development of initiatives in related areas and across traditional boundaries and between disciplines.

In addition to the informal liaison cited above, all courses are reviewed annually and assessed for reaccreditation purposes every five years by Course Assessment Committees. These Committees, assisted by Consultative Committees, are comprised of representatives from industry and from other academic institutions, and have both an advisory role and an assessment function with respect to a course.

Close interaction between employers and academic staff is afforded by the co-operative education option, which integrates closely the student's academic studies with an extended period of paid industrial experience, and is available in all degree level courses offered by the Faculty.

Interaction with the community is further enhanced through the provision by Departments of continuing education courses on a range of topics appropriate to their areas of expertise. In addition, the community benefits through the availability of staff to undertake applied research projects, consultancy activities and testing services.

As a result of its close association with industry and the expertise of its staff, the Faculty of Science provides up-to-date educational programs with a practical emphasis based on a sound theoretical foundation. Hence, graduates are able to avail themselves of a range of satisfying career opportunities in widely diverse fields.

A brief description of the characteristics and interests of each department follows:

*The Department of Applied Geology* produces graduates with the training and capabilities required by organisations primarily involved in mining or exploration for metals, fuels, construction materials and other natural resources.

The major areas of expertise in the department are economic geology, geochemistry, coal geology, sedimentology and geophysics. Practical applications of geology are emphasised in the course, culminating with a project thesis in the final year. The Applied Sedimentology and Environmental Geology Research Unit in the department is concerned with sedimentation control, sedimentary mineralisation and geotechnical problems related to sedimentary geochemistry.

The department has established strong industrial ties, including consultancy in economic geology, geochemistry and environmental geology.

Graduates from *the Department of Biology* have developed the skills required to identify and solve biological problems in our technological society, together with a range of appropriate techniques. They receive a grounding in molecular, organismic and ecological aspects of biology, and modelling dynamics of biological systems is a major theme.

The staff of the department are involved in consulting and applied research projects by means of which definite interfaces with the community have been established. Particular emphasis is placed on studies of pest populations and aquatic environments with respect to resource management and aquaculture. Research is also undertaken in plant tissue culture, with particular emphasis on economic plants.

A further activity of the department is the training of biological technicians with the wide range of technical skills appropriate to both laboratory and field work, and including aspects of tissue culture and aquaculture.

*The Department of Chemistry* has developed its main thrust in two well-defined directions:

- (i) analytical chemistry and advanced instrumental techniques
- (ii) process chemistry and chemical technology

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These aims are pursued in the undergraduate courses in which students are provided with a thorough grounding in the theory and practice of the modern techniques of analysis, process control and industrial chemistry. Some of these areas are developed in depth in the MAppSc course in Analytical Chemistry. The department also undertakes the training of chemical technicians in analytical chemistry and industrial analysis.

The department has earned a high reputation for its research and consulting work, especially in areas of industrial chemistry and environmental process technology.

*In the Department of Mathematics*, the main emphasis is on the application of mathematical methods and quantitative analytical techniques to various scientific, engineering and business situations. In this respect the department's reputation in consulting and research in the fields of mathematical modelling and operations research time series analysis, forecasting and coding theory ranks very highly.

Areas of particular development within the department include the applications of mathematics to problems arising in commerce and industry and the growth of activity in areas of quality technology, operations research and statistics. This has resulted in the introduction of a Graduate Diploma in Quality, a Graduate Diploma in Quality Assurance and the inclusion of topics involving mathematical economics, statistical forecasting, actuarial mathematics, mathematics of finance and coding and encryption techniques into the mathematics major.

*The Department of Physics*, in respect of both its staff and the courses it conducts, is noted for its activity in the sphere of medical physics, interpreted in the broadest sense. Areas of expertise within this field include medical ultrasonics, *in vivo* analysis using nuclear and atomic techniques, biomechanics, clinical measurement, environmental monitoring (including radiation, particulate and gases) and instrumentation. Another developing area within the department is that of materials science, in particular, the properties and instrumental analysis of materials.

In addition, the department has a program of continuing education in selected topics such as noise measurement, experimental physics, radiation physics, electronics and medical ultrasonics.

With respect to the sphere of medical physics, the Department of Physics has gained widespread recognition through the medical physics course, through its consultancy activities and the receipt of research grants. The value of the medical physics course has also achieved international recognition.

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## Preface



**1**





**Message from  
the Registrar  
on the  
establishment of  
Queensland University  
of Technology**

At the time of printing this handbook QIT is preparing for re-constitution as a new institution, the Queensland University of Technology.

The Premier of Queensland has announced the Government's intention to introduce legislation to the Queensland Parliament in the 1988 Spring session, probably in November 1988, to establish an institution to be named the Queensland University of Technology. Subject to the will of Parliament the new institution will come into being on 1 January, 1989.

**Transition from QIT to QUT**

*By-Laws and Rules*

The information published in this handbook has been prepared on the understanding that the Queensland University of Technology Act will provide that all By-Laws and Rules of the Queensland Institute of Technology will continue in force and apply to the new institution until new Statutes and Rules have been approved.

As soon as practical after the establishment of the QUT, the Council of the University will submit new Statutes for Executive Approval in substitution for the existing By-Laws and will approve new rules to be framed under the provision of those Statutes. Care will be taken to ensure that students' enrolment and course progression are not adversely affected in this transition.

*Transfer of Courses and Students*

Subject to the existing By-Laws and Rules (e.g. unsatisfactory academic performance rules), students of the QIT shall become students of the QUT with full transfer of their previous academic records. All courses offered by the QIT shall become courses of the QUT.

*Debts and Obligations*

Any debts or obligations owing to the QIT (e.g. fines or loans) shall be debts or obligations owing to the QUT. Equally, debts or obligations of the QIT (e.g. refund of laboratory deposits) shall be the responsibility of the QUT.

*Publication of QUT Calendar*

As early as possible in 1989 the University will publish its first Calendar (or institutional handbook). This publication will contain the Statutes and Rules of the Queensland University of Technology and other information on the new institution as approved by the University Council. Particularly in the first year of the university's operation all students should purchase a copy of the Calendar when it becomes available.

*Conclusion*

By the time this Faculty handbook is released for publication it is expected that the Act establishing the Queensland University of Technology will be law. I therefore take the opportunity to welcome all staff and students to the new institution.

B S Waters  
**Registrar**

## **Rules Relating to Student Matters**



## **RULES RELATING TO STUDENT MATTERS**

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### **Admission to Courses**

The Council may -

1. prescribe the conditions for normal entry to each course offered.
2. limit the number of students who shall be permitted to enrol or continue in any course.
3. appoint an Admissions Committee and approve of rules providing for -
  - (a) its membership including the appointment of a Chairman;
  - (b) its method of operation;
  - (c) the admission of students who do not comply with normal entry;
  - (d) the selection of students to be admitted where quotas or restrictions have been imposed upon admissions and enrolments;
  - (e) a quorum.

### **Academic Structure and Content of Courses**

The Council may -

4. prescribe the academic structure and content of any courses and amend these at any time provided the reasonable rights of students already enrolled in the course are not prejudiced or are sufficiently safeguarded;
5. prescribe rules for student progression within a course;
6. delegate any or all of its powers under this section.

### **Assessment of Students**

The Council may -

7. approve rules relating to the examination and assessment of students and the award of grades of passes;
8. delegate any or all of its powers under this section.

### **Exclusion of Students**

The Council may -

9. prescribe rules relating to gross failure;
10. exclude any student who is classified as having achieved gross failure in subjects or courses;
11. delegate any or all of its powers under this section provided that any student shall have a right of appeal to Council against any decision on exclusion.

## Appeals

Council shall establish an Appeals Committee to hear student appeals to the Council against exclusion and approve rules not inconsistent with By-law No. 5 or rules thereof in respect of the duties powers membership and management of the business of such Committee.

## RULES FOR ADMISSION

1. Meaning of certain words. Unless the context otherwise indicates or requires -
  - 'Admission Committee' means a committee appointed by Council to consider applications for admission to University courses.
  - 'Dean of Faculty' means a member of the academic staff appointed by Council and so designated.
  - 'Head of School' means a member of the academic staff appointed by Council and so designated as the senior academic member of staff in a particular School. Reference to 'Head of Department' in these Rules is deemed to include reference to 'Head of School'.
  - 'Head of Counselling' means the officer in charge of the University's Counselling Centre.
  - 'Academic Staff Association' means the Academic Staff Association of the University.
  - 'Ordered Course' means a course in which a student is required, to gain credit in a number of subjects in a particular sequence to acquire an award.
  - 'Head of Department' means a member of the academic staff appointed by Council and so designated as the senior academic member of staff in a particular Department. Reference to 'Head of Department' in these Rules is deemed to include reference to 'Head of School'.
  - 'Sub-tertiary course' means a course of study leading to the award of a Certificate.
  - 'Tertiary Course' means a course of study leading to the award of a Degree Diploma or an Associate Diploma.
  - 'Assistant Registrar' means the Assistant Registrar of the University.
  - A 'Registered Student' is a student in an ordered course whose first enrolment in that course has been accepted and approved by the Registrar. A student shall remain a registered student until he:
    - (a) completes the course, or
    - (b) withdraws from the course, or
    - (c) is excluded from the course, or
    - (d) fails to enrol in the course.
2. The membership of the Admissions Committee shall be -
  - Registrar (who shall act as Chairman)
  - Deans of Faculties

Head of Counselling

One representative appointed by the Academic Staff Association.

A member of Committee may be permitted to appoint another person who is not a member to attend and vote on his behalf.

3. The Admissions Committee shall -
  - (a) advise the Director and the Academic Assembly on all matters relating to the admission of students including -
    - (i) the standards of entry to all courses after consideration of recommendation prepared by the Academic Boards;
    - (ii) the assessment of prospective future enrolments following periodic reviews of statistical trends;
    - (iii) the recommendation or policies for determining those who should be given priorities for admission or enrolment where quotas or restrictions on admissions or enrolments are in the opinion of the Council necessary.
  - (b) determine eligibility for admission in those cases where the applicant does not possess normal entry standards.
4. A person desirous of entering a course shall make application to the Registrar for admission on a form provided for this purpose, and shall lodge such form fully and correctly completed not later than the closing date prescribed by the Council.

With such application, the person shall produce to the Registrar for verification, sufficient documentary evidence of passes in pre-requisite examinations.

The documentary evidence produced for verification shall be -

  - (a) the original documents or facsimile copies thereof;
  - (b) such other evidence as the Admissions Committee may require.
5. A person who does not have the normal entry qualifications may make application for special consideration for entry on a form provided by the Registrar.
6. Concurrently with an application for special consideration for entry a person shall lodge with the Registrar an application for enrolment on the form provided for the purpose, and shall lodge such form fully and correctly completed not later than the closing date prescribed.
7. The Registrar shall notify all applicants for admission of the acceptance or rejection of their applications.
8. An application for enrolment may be amended by the Head of Department because of -
  - (a) timetable incompatibility;
  - (b) non-compliance with the rules applicable to the course of study;
  - (c) selection by the applicant of subjects which in the opinion of the Head of Department are more than his capacity or

circumstances allow him to study adequately.

An applicant whose application for enrolment has been amended shall have a right of appeal to the Dean of Faculty. Such an appeal shall be lodged with the Registrar within fourteen (14) days from date of notification of such amended enrolment. The Registrar shall notify the applicant of the result of the appeal as soon as is reasonably possible.

9. Late enrolments may be accepted only if a vacancy exists in classes established on the basis of closing date enrolments, and with the approval of the Dean of Faculty.
10. A Dean of Faculty may cancel any class in any subject where the number of enrolments in that class is considered to be insufficient.

Class groups shall be determined on enrolments at a closing date prescribed by Council. In the event of the cancellation of any class the enrolment of a student shall be deemed to be cancelled in respect of such subject provided that such cancellation shall be without prejudice to the right of the student to again apply for admission for enrolment in such subject, subject to the conditions prescribed for entry to such subject at the time of his application.

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## **RULES RELATING TO UNREGISTERED STUDENTS**

1. Unregistered Students are defined as those students who undertake individual subjects from accredited University courses (award courses) and receive normal instruction, assessment and examination results in such subjects but who are not registered to undertake a complete award course.
2. There shall be two categories of Unregistered Students:
  - (a) Miscellaneous Students who pay no tuition fees and who are enrolled under special approval arrangements, for example, to undertake an approved bridging program prior to entering a specific award course, to satisfy provisional enrolment requirements, to complete a second or subsequent strand of a University course or to complete a course offered by another institution;
  - (b) Visiting Students who pay a tuition fee as determined by the University's Continuing Education Committee, who undertake as continuing education students individual subjects from award courses for means of professional or personal development, but who do not come within the definition of Miscellaneous Students.
3. Enrolment as an Unregistered Student shall be subject to the applicant's completion of application procedures as determined by the Registrar and to the approval of the application by the Head of Department or Head of School responsible for teaching the subject.

4. Unregistered Students shall be required to pay the appropriate Union Fee and shall be subject to the rules of the University, with the exception of Rules 41 to 46 of the General Examination Rules (Unsatisfactory Academic Performance).
  5. Miscellaneous Students shall not be permitted to accumulate credits for more than 20% of the total course hours within a course. Visiting Students shall not receive credit towards a University course for any subject undertaken as a Visiting Student.
  6. Where quotas or other restrictions apply to a subject, a student registered for a University course will have precedence over a Miscellaneous Student and a Miscellaneous Student shall have precedence over a Visiting Student.
  7. Where a registered student is also undertaking a subject or subjects offered in a course other than that for which the student is registered, the application of the Rules on Unsatisfactory Academic Performance in the course for which the student is registered will not be affected in any way by the results obtained in the subject or subjects undertaken in the unregistered mode.
  8. When a registered student is excluded from a course due to unsatisfactory academic performance, the student shall not be eligible subsequently for enrolment as an unregistered student in any subject of that course except at the discretion of the Dean of the Faculty responsible for the conduct of the course.
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### **RULES RELATING TO EXEMPTIONS**

1. Subject to the provisions of Rules 2 and 3 hereof, a student who has completed a program considered by the Head of School or Head of Department responsible for the course as being an adequate and relevant substitute for a subject or subjects prescribed in the relevant course rules may be granted exemption from the whole or part of that subject or those subjects.
2. Exemptions may be granted for any number of subjects provided that -
  - (a) in the case of a course which exceeds two semesters full-time or four semesters part-time, exemptions may be granted up to a limit such that in order to qualify for the award the student must have completed satisfactorily within the University the equivalent of at least two semesters of full-time study or where the course is not offered for full-time study four semesters of part-time study in subjects nominated by the Head of School or Head of Department responsible for the course, irrespective of the course in which the student was registered while undertaking the nominated subjects;
  - (b) in the case of a course which does not exceed two semesters

full-time or four semesters part-time, exemptions may be granted up to a limit such that in order to qualify for the award the student must complete satisfactorily within the University subjects nominated by the Head of School or Head of Department responsible for the course, the contact hours of which aggregate to 75 percent or more of the prescribed minimum contact hours of the course, irrespective of the course in which the student was registered while undertaking the nominated subjects;

- (c) where a student gains an award in one University course, in order to qualify for a second or subsequent University award the provisions of 2(a) or 2(b) above must be satisfied subsequent to registering for the second or subsequent course.
  3. Exemptions will not be granted in connection with or for the Graduate Diploma in Legal Practice course.
  4. Except as specifically provided in individual Course Rules and save in exceptional circumstances as determined by the Registrar all applications for exemption must be made and determined at the time of a student's first Enrolment in the course to which the exemptions refer.
  5. Whenever exemptions granted constitute 50% or more of the full course program, the Head of School or Head of Department responsible for the course shall provide the Registrar with full details of the study program which the student has to complete at the University to qualify for the award. The Registrar shall advise the student of such requirements in writing.
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### **RULES RELATING TO STUDENTS WHO SEEK RE-REGISTRATION**

1. Subject to the provisions of clauses 2 and 3 below, a student whose registration in a course has lapsed because of withdrawal from the course or failure to re-enrol in the course and who wishes to re-register in that course.
  - (a) must apply for registration in the course by submitting a Re-enrolment Form;
  - (b) shall be subject to the Course Rules in operation at the time of resumption; and
  - (c) must re-enrol as directed.
2. The provisions of clause 1 of this Rule do not apply to students, who, at the time of resumption, have not satisfactorily completed all the subjects listed in the Course Rules for the first and second semesters, full-time, part-time, or external, as the case may be, of the course in which re-registration is sought. Such students are not eligible to re-enrol and must apply for admission to the course

- in the manner prescribed for new students.
3. Upon withdrawal from a course, or upon failure to re-enrol in a course a student who has not satisfactorily completed all subjects listed in the Course Rules for the first and second semesters, full-time, part-time or external, as the case may be, of that course, may be granted leave of absence upon production to the Registrar of documentary evidence acceptable to the Registrar in the case of medical or other compassionate grounds and acceptable to the relevant Academic Board responsible for the course in any other case. Such leave of absence shall be for a specific period at the expiration of which the student may re-enrol without loss of credit for results awarded prior to the date of withdrawal. A student to whom leave of absence has been granted shall be deemed for the period of leave of absence to be no longer proceeding to an academic award and must, on termination of the leave of absence, re-enrol or apply for an extension of the leave of absence. If a student fails to re-enrol or obtain an extension his registration will lapse.
  4. A student whose registration in a course has lapsed as a consequence of exclusion from the course and who wishes to re-register in the course must apply for readmission in accordance with Rule 46 of the General Examination Rules.
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## GENERAL EXAMINATION RULES

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### Part I. DEFINITIONS

- 'Academic Board' means a Board constituted by Council to exercise certain academic functions in relation to a particular Faculty.
- 'Committee of the Academic Board' means a group of members of the Academic Board constituted by the Academic Board to exercise those particular academic functions prescribed by the Academic Board.
- 'Award' means a Degree, Graduate Diploma, Diploma, Associate Diploma or Certificate conferred upon a student by the Council.
- 'Chief Examiner' means an officer appointed and so designated by a Head of Department in relation to an examination in a particular subject for a particular period.
- 'Examiner' means an officer appointed by the Head of Department to set and mark examination papers in a particular subject for a particular period.
- 'Supervisor' means an officer appointed by the Registrar or nominated by a Head of Department to supervise the conduct of a particular examination.
- 'Central Examination' means any examination administered by the office of the Registrar.
- 'Departmental Examination' means any examination administered by a Department.
- 'Supplementary Examination' means a further examination given to a student who has failed to pass a subject.
- 'Deferred Examination' means an examination given to a student in cases where the student has failed to sit for and complete an examination and the reasons for such failure have been accepted by the Dean of Faculty.
- 'Course' means a group of subjects specified by the rules which must be successfully completed in order to qualify for a specified award.
- 'Subject' means the basic educational unit for which results are awarded within the University.
- 'Result' means the formal indicator of a student's achievement in a subject.
- 'Assessment Provisions' means the systems of assessment approved for a subject and may include Central Examinations, Departmental Examinations, Assignments, Field Work, Practical Work, Reports, Seminar Participation or other work which a student is required to do and which will be assessed in determining a student's result in the subject.
- 'Dean of Faculty' means a member of the academic staff appointed by Council and so designated.
- 'Head of School' means a member of the academic staff appointed by Council and so designated. Reference to 'Head of Department' in these Rules is deemed to include reference to 'Head of School'.
- 'Head of Department' means a member of the academic staff appointed by Council and so designated as the senior academic member of

staff in a particular Department except that where there is no Department responsible for subjects the Dean of Faculty shall be regarded as the Head of Department. Reference to 'Head of Department' in these Rules is deemed to include reference to 'Head of School'.

'Registrar' means the Registrar of the University.

'Vice-Chancellor' means the Vice-Chancellor of the University.

## **Part II. DETERMINATION AND NOTIFICATION OF ASSESSMENT PROVISIONS**

### *1. Authority to Prescribe Assessment Provisions*

- (a) The Assessment Provisions for each subject shall be prescribed by the Department responsible for the subject and shall be approved by the Academic Board of the Faculty to which the Department is attached.
- (b) An Academic Board shall have the power to delegate its responsibility under this rule to a Committee of the Academic Board subject to any conditions the Academic Board may impose. The Academic Board shall resolve any disputes.

### *2. Notification of Assessment Provisions in Subjects*

Within a reasonable period of the commencement of a subject students shall be provided with written advice of the Assessment Provisions in the subject, together with information on the weight and timing of each item of assessment. If a passing grade is required in any or each item of assessment in order to obtain a passing grade in the subject this information must also be included in the advice to students.

## **Part III. ORGANISATION OF EXAMINATIONS**

### *3. Periods for Examinations*

- (a) The periods within the academic year to be set aside for Central Examinations, Supplementary Examinations and Deferred Examinations will be determined by Council and published in the University Calendar.
- (b) The timing of Departmental Examinations shall be as determined by the Department concerned after agreement with other Departments which might be affected by any determination and, where appropriate, by agreement with the Registrar.
- (c) Except in exceptional circumstances and with the specific approval of the Registrar no Central Examination or Departmental Examination, other than Deferred or Supplementary Examinations may be held during a period shown on the University Calendar as reserved for Examination preparation or for Recess periods.

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#### 4. *Accommodation*

The Registrar shall have first call on Lecture Rooms, Seminar Rooms, Drawing Offices, and other examination accommodation during periods approved for Central Examinations.

#### 5. *Appointment of Examiners*

- (a) The relevant Head of Department shall appoint examiners and, where appropriate, chief examiners each semester for each subject in that semester.
- (b) The names of all examiners shall be forwarded by the Head of Department to the Registrar by a date to be prescribed by the Registrar.

#### 6. *Submission of Central Examination Papers*

The Registrar may prescribe the date upon which all Central Examination papers required to be set by examiners are to be forwarded to the Examinations Section within the Registrar's Office and the form in which such papers will be received.

#### 7. *Timetables*

- (a) The Registrar shall be responsible for the preparation of a timetable for all Central Examinations and for the publication of this timetable as required by these rules.
- (b) Each Head of Department shall be responsible for the preparation of a timetable for Departmental Examinations conducted by the Department and shall place such timetable on appropriate Departmental Noticeboards.
- (c) A timetable for Central Examinations shall be posted on the main University Noticeboards and to external students not less than three weeks prior to the commencement of the relevant semester examination period.
- (d) Should any timetable show a clash between subjects for which the student is enrolled, it is the responsibility of the student to notify either the Registrar or the Head of Department as the case may be by the date prescribed for such notification.
- (e) No amendment to a timetable for Central Examinations will be accepted following distribution of student examination forms referred to in Rule 8(a).

#### 8. *Student Examination Form*

- (a) The Registrar shall forward to each student at least two weeks prior to the commencement of the Central Examination period an examination form showing all the subjects in which the student is enrolled in the current semester, a statement of whether the subject has a Central Examination scheduled and the date and time of the examination in those subjects which are to be centrally examined.
- (b) The student shall take this form to all examinations and shall produce the form on request as provided for in Rule 18.

#### **Part IV. ELIGIBILITY TO UNDERTAKE ASSESSMENT PROVISIONS**

##### **9. Eligibility to Undertake Assessment**

Subject to the provisions of Rule 10, a student who holds a current enrolment approval in a subject shall be eligible to undertake the assessment provisions for that subject.

##### **10. Eligibility to Sit for Examinations**

- (a) A student may be declared ineligible by the Head of the Department responsible for the course to sit for an examination as a consequence of having failed to fulfil all the conditions as set out in the rules pertaining to the course for which the student has enrolled.
- (b) The Registrar may prescribe the date by which Heads of Department must advise the Registrar of the names of students who are declared to be ineligible under this rule and upon receipt of advice from the relevant departments will so advise the students in writing of their ineligibility inviting them to show cause by a prescribed date why ineligibility should not be confirmed.
- (c) Where students show cause why they should not be declared ineligible their cases shall be referred to the Dean of Faculty for review and determination.
- (d) A student declared by the Dean of Faculty to be so ineligible shall have the right of appeal to the Director.

##### **11. Voluntary Withdrawal from Enrolment in Subjects**

- (a) A student who cancels enrolment in a subject on or before the final date for cancellation of subjects without penalty shown in the University Calendar shall not receive any result for the subject.
- (b) Subject to sub-rule 11(c), a student who cancels enrolment in a subject after the final date for cancellation of subjects without penalty shown in the University Calendar *and before the date shown in the Calendar for the end of the relevant semester*, shall be regarded as having presented for assessment and shall receive the result 'Fail - Late Cancellation'.
- (c) If the Registrar, on the advice of the Faculty, is satisfied that medical, compassionate, or other exceptional circumstances necessitate a student cancelling a subject, such cancellation may be granted without penalty even though the date of cancellation was after the final date for cancellation without penalty specified in the University Calendar.

#### **Part V. DEFERRED EXAMINATIONS AND SPECIAL CONSIDERATION**

##### **12. Failure to Attend for Examination at the Prescribed Date and Time**

Subject to the provisions of Rule 13, a student who fails to attend an examination which is shown on the examination form referred to in Rule 8 will be deemed to have sat for and failed the examination.

13. *Deferred Examination*

- (a) A student who for medical or compassionate reasons or other circumstances beyond the student's control, was, or will be, unable to sit for an examination may apply for a Deferred Examination. An Application for Deferred Examination must be lodged with the Registrar as soon as practicable, and in any case not later than the date prescribed in the University Calendar, and must be supported by suitable medical or other evidence in the form specified in Rule 15.
- (b) Should the medical or other evidence submitted in support of an Application for Deferred Examination be acceptable to the relevant Dean of Faculty, the student shall be granted a Deferred Examination.

14. *Special Consideration of Factors Affecting Examination Performance*

- (a) Candidates who consider that their performance in an examination has been adversely affected by illness, disability, bereavement or other exceptional circumstances may apply for special consideration. Such applications must be lodged with the Registrar as soon as practicable, and in any case by the closing dates specified in the current University Calendar. Such applications must be supported by medical or other evidence in the form specified in Rule 15.
- (b) The Registrar shall forward applications for special consideration to the relevant Dean of Faculty for determination. The Dean of Faculty may refer the application to the relevant chief examiner who, in consultation with the appropriate examiner or examiners, shall take such account of the information contained therein as is considered appropriate in deciding the result to be recommended for the candidate in the subject in question.
- (c) Notwithstanding Section (b) of this rule, Academic Boards may prescribe additional procedures to facilitate consideration of special consideration applications.

15. *Evidence in Support of Applications for Deferred Examinations and Special Consideration*

- (a) **Medical Evidence:** A candidate who applies for a Deferred Examination or for special consideration on medical grounds must submit a medical certificate from a registered medical or dental practitioner stating:
  - (i) the date on which the student was examined;
  - (ii) the nature, severity and duration of the complaint;
  - (iii) the practitioner's opinion of the effect on the student's ability to take, or to perform satisfactorily in, the examination.

A statement that the student was not fit for duty, or was suffering from 'a medical condition' will not be accepted.

- (b) Evidence other than medical evidence: A candidate who applies for a Deferred Examination or for Special Consideration on other than medical grounds must submit with the application a Statutory Declaration stating the disability or exceptional circumstances, which precluded the candidate from taking the examination in the appointed place and/or at the appointed time or which the candidate considers affected performance in the examination. The candidate should also furnish any corroborative evidence in support of the application.
- (c) A Deferred Examination may not be granted if in the opinion of the relevant Dean of Faculty more timely notice of difficulties would have permitted arrangements to have been made for the original examination to be taken close to the original time set down for the examination.
- (d) A Deferred Examination will not normally be granted to candidates who misread the Examination timetable.

## **Part VI. CONDUCT OF EXAMINATIONS**

### **16. *Responsibility for Conduct of Examinations***

- (a) The Registrar shall be responsible for the conduct of all Central Examinations in accordance with the rules contained in this Part VI.
- (b) The relevant Head of Department shall be responsible to the Registrar for the conduct of Departmental Examinations in accordance with the rules contained in this Part VI.

### **17. *Entry to Examination Rooms***

- (a) All persons entering an examination room must provide proof of identity to the supervisor.
- (b) A person other than the candidate, supervisor, chief examiner or chief examiner's nominee, Head of Department, Registrar or Registrar's nominee, may not except with the permission of the supervisor enter an examination room during an examination session.
- (c) Except with the permission of a supervisor no person other than a supervisor, the Registrar or the Registrar's nominee may enter an examination room during the period of forty-five minutes immediately preceding an examination session set down for that room.
- (d) A person whether a candidate or not, who is given permission to enter or leave an examination room shall comply with all conditions on which the permission is given.

### **18. *Identification***

A candidate shall bring to the examination room the student

examination form and student card provided to each student and shall produce or keep displayed such information in accordance with any direction given by notice displayed in the examination room, by direction on an examination book, by a supervisor or otherwise.

19. *Places*

A candidate for an examination shall upon entering an examination room proceed without delay to such place as the candidate is or has been directed to occupy for that examination by a supervisor or by notice, or other means, and shall not leave that place except with the permission or by the direction of a supervisor. A supervisor may at any time direct a candidate to leave any such place and to occupy another place specified by the supervisor, and a candidate shall without delay comply with any such direction.

20. *Time for Departure*

- (a) A candidate may not leave an examination room before the end of the examination session without the permission of a supervisor.
- (b) Except in exceptional circumstances permission to leave an examination room will not be granted before the expiration of half the working duration of the examination.

21. *Candidates Not to Remove Papers*

A candidate shall not remove from the examination room any worked script or other paper provided for use during the course of the examination (other than the question paper supplied where this is authorised by the supervisor on advice from the examiner) or other material the property of the University.

22. *Cheating*

- (a) A candidate shall not cheat or attempt to cheat in any examination.
- (b) A person whether a candidate or not shall not do anything intended to assist any other person sitting for an examination to cheat or otherwise defeat the purposes of the examination.

23. *Candidate not to Communicate with Others*

A candidate shall not during an examination session communicate by word or otherwise with any other person except a supervisor, examiner or examiner's nominee, or assist any other person to communicate with another person, or willingly receive a communication from any person other than a supervisor, examiner or examiner's nominee.

24. *Unauthorised Material not to be brought into the Examination Room*

A candidate shall not bring into an examination room anything whatsoever which conveys or is capable of conveying information concerning or otherwise has reference to any subject or is such that it may reasonably give rise to suspicion that it is capable of

conveying information concerning or of having reference to any subject or that it was intended by the candidate to do so. It is immaterial that the subject is not a subject to which the examination relates.

It shall be sufficient answer to any alleged breach of this rule if the candidate establishes that anything brought by the candidate into an examination room was -

- (a) declared as permissible by the examiner and is so indicated on the examination paper, or
- (b) brought in with the permission of the supervisor, or
- (c) deposited by the candidate within the room forthwith after entering it at a place designated by the supervisor as a place where such thing may be deposited.

25. *Candidate to Comply with Directions*

- (a) A candidate shall comply with all directions to candidates set forth on the examination book or such other examination material supplied or set out on any notice displayed in the examination room and shall without delay comply with any reasonable direction given by the supervisor.
- (b) A candidate's behaviour shall not be such as to disturb or distract or adversely affect any other candidate.
- (c) In the event of breach or default by a candidate under or in respect of 25(a) or 25(b) the supervisor may require the offending candidate to leave the examination room and failure by the candidate to do so shall be deemed to be a breach of discipline and the student may be dealt with under By-law 9(2).
- (d) All such exclusions shall be reported immediately to the Registrar or in his absence the Deputy Registrar or officer designated by the Registrar to conduct the examination and the Registrar, Deputy Registrar or other officer after hearing the supervisor the candidate and any relevant evidence may either confirm or rescind the exclusion.

26. *Supervisors Powers of Inspection and Enquiry*

- (a) A supervisor may require a candidate to show by such means as the supervisor may specify and as the supervisor considers appropriate to the circumstances that the candidate does not possess or in any way have available any such thing as is specified under Rule 24 or that the candidate is not committing or has not committed a breach of Rules 22 or 23 and the candidate shall comply without delay with such requirement.
- (b) If a supervisor considers that unauthorised material has been brought into the examination room, the supervisor may confiscate such material together with worked scripts completed to that time. The supervisor shall submit any material so confiscated to the Registrar or the Registrar's nominee for investigation.

## Part VII. PLAGIARISM

Plagiarism is the act of taking and using another's work as one's own. Where plagiarism occurs in items of assessment contributing to the result in a subject it shall be regarded as, and treated in the same manner as, cheating in an examination. For the purpose of these rules any of the following acts constitute plagiarism unless the work is acknowledged:

- (a) copying the work of another student;
- (b) directly copying any part of another's work;
- (c) summarising the work of another;
- (d) using or developing an idea or thesis derived from another person's work;
- (e) using experimental results obtained by another.

### 27. *Plagiarism*

A student shall not plagiarise in any assessment exercise.

## Part VIII. PENALTY FOR BREACH OF RULES

### 28. *Penalties*

- (a) If a candidate commits a breach of any rule contained in Parts VI and VII of these rules, the candidate may be dealt with under By-law 9(2) or 9(3).
- (b) A candidate who commits a breach of a rule contained in Parts VI and VII of these rules shall be liable in addition to any other penalty to incur the following penalties.

For a first breach -

- (i) the award of a low fail result in the subject concerned, or
- (ii) the award of low fail results in all subjects in which the student would have received final results in the same academic semester.

For a further breach -

- (i) exclusion from the University for a period, or
- (ii) permanent exclusion from the University.

A candidate incurring either of these last mentioned penalties resulting in exclusion from the University shall have a right of appeal to the Council.

- (c) Any complaint that a student allegedly breached a rule contained in Parts VI or VII of these rules shall be referred to the Registrar, or an officer delegated by the Registrar to deal with examination matters, to determine whether the complaint should be investigated. The Registrar, or other officer, shall notify the Vice-Chancellor of any alleged breach which it has been resolved should be investigated. The Vice-Chancellor may in writing require the student to show cause within not less than seven days from the date of such

requirement why penalty should not be imposed under this rule. In the event of the student failing to show cause, acceptable to the Vice-Chancellor, the Vice-Chancellor may impose a penalty as provided for in this rule 28.

- (d) Any penalty imposed under this rule shall be communicated to the relevant Dean of Faculty for information.

## **Part IX. ASSESSMENT OF RESULTS**

### **29. *List of Candidates***

The Registrar shall supply to each examiner or Head of Department/School a list of candidates for whom a result is required in each subject. Such list shall be referred to as the Examiner's Return.

### **30. *Duties of Examiners***

The Examiners shall furnish to the Head of Department/School offering the subject through the Chief Examiner where such is appointed -

- (a) The Examiner's Return amended to show -

- (i) such details of each candidate's performance as may be required by the Head of Department/School or Chief Examiner;
- (ii) a statement of those from whom no script was received;
- (iii) the name of any candidate who submitted a script and whose name was not included in the list supplied by the Registrar.

- (b) the examiner's recommended grade lines.

### **31. *Powers and Duties of Head of Department/School offering subjects***

Prior to the consideration of results by Academic Boards, the Head of Department/School may approve or vary the percentage or result recommended for each candidate, provided always that, before making such a variation, the Head of Department/School shall advise the examiner concerned of the variation proposed and consider any representation that the examiner may wish to make.

### **32. *Provision of Information to Academic Boards***

On the basis of the results furnished by the Head of Department/School offering subjects, the Registrar shall provide to each Academic Board -

- (a) For each subject offered by a Department or School within the Faculty and which is being assessed in the current examination period, a list showing the result recommended for each candidate, and an analysis of the recommendations showing the numbers of each grade of pass or failure recommended; and
- (b) For each course administered by the Faculty, a list of the students enrolled showing the recommended result for each subject in which the student is enrolled.

33. *Powers and Duties of an Academic Board in relation to subjects offered by the Faculty*
- (a) The Academic Board shall review the recommended grade lines for each subject offered by the Faculty and the recommended result for each candidate and shall determine the final result in terms of the grade of result set out in Part IX of these rules to be recommended to each Academic Board which administers a course or courses having candidates enrolled in those subjects.
  - (b) *Application of Academic Board Policy*  
Where an Academic Board has prescribed a policy which requires an adjustment of results the Dean of Faculty, before submitting results recommended for each candidate to the Academic Board, shall adjust the recommended grades in any subject in accordance with that policy, and shall report any adjustment so made to the Academic Board.
34. *Powers and Duties of an Academic Board in relation to students undertaking courses administered by the Faculty*
- (a) The Academic Board shall review the results recommended for each student in the course and, in terms of the approved course rules and such policy as has been set down by the Academic Board, shall determine -
    - (i) whether action should be taken to amend a recommended result in terms of Rule 34(b)(iii);
    - (ii) whether the candidate shall be granted conceded passes in subjects in which passes have not been granted;
    - (iii) whether the candidate shall be granted supplementary examinations or shall be required to submit for such other additional means of assessment as the Academic Board shall determine.
  - (b) In reviewing the results for each student undertaking one of its courses an Academic Board may only determine a result different from that recommended by the Academic Board offering the subject in one of the following ways -
    - (i) in accordance with Rule 34(a)(ii);
    - (ii) in accordance with Rule 34(a)(iii);
    - (iii) after advice to the Head of Department/School offering the subject, or the Chief Examiner, of the intended variation to the candidates result and only after consideration of any matters which that Head of Department/School or Chief Examiner may wish to place before the Academic Board.
  - (c) Where an Academic Board administering a course has determined a policy in relation to the assessment of examination results it may delegate to a Committee of the Board the authority to exercise its powers under these rules. All such

authority exercised on behalf of the Board must be consistent with the policy laid down by the Board and all decisions made by the Committee must be reported at the next meeting of the Board.

35. *Powers of Alteration*

A result determined by the Academic Board administering a course, and a decision concerning the granting of supplementary examination to a candidate may be altered by the Dean of Faculty administering the course with the concurrence of the Head of Department/School or Chief Examiner concerned -

- (a) to correct a patent error, or
- (b) to make the result or decision accord with the result or decision which the Dean of Faculty and the Head of Department/School, Chief Examiner and where possible the examiner, are satisfied would have been confirmed or made by the Academic Board if it had considered relevant circumstances which were not considered by the Board.

Any such alteration and the reasons therefore shall be reported to the Academic Board at its next meeting, and shall be reported to the Registrar for the purpose of amending the student's academic record.

36. *Grading of Results*

- (a) A pass in each subject may be designated as a High Distinction (HD), Distinction (D), Credit (C) or Pass (P).
- (b) Where the Academic Board administering the course so determines in accordance with Rule 33 a Pass Conceded (Q) may be awarded in a subject.
- (c) Where the Academic Board administering the course so determines, all candidates gaining a pass in a subject may be awarded with a result of Pass - Non Graded (R).
- (d) Where the Academic Board administering the course so determines, all candidates in a subject may be assessed as having Satisfactorily Completed (G), or Not Satisfactorily Completed (Z) the subject.
- (e) Where students have been granted supplementary examinations in subjects, they may not subsequently be awarded with a grade higher than Pass - Supplementary (T) in those subjects.
- (f) Where students have been granted deferred examinations they may be awarded passes in terms of High Distinction (HD), Distinction (D), Credit (C), Pass (P), Non-Graded Pass (R), Satisfactorily Completed (G) or Pass Conceded (Q).
- (g) A fail in each subject will be designated as a Fail (N) or Low Fail (L) except that where candidates have no assessment in subjects they will be awarded Fail - No Assessment Undertaken (X) or where students notify of their withdrawal from

subjects after the official cancellation date and they are not granted cancellation without penalty they will be awarded Fail - Late Cancellation (K) or where students are not successful at a supplementary examination they will be awarded Fail - Supplementary (M).

37. *Unfinalised Results*

(a) *Withheld Results*

Where candidates have failed to comply with the Rules pertaining to a particular subject or course, irrespective of whether they have been permitted to sit for the relevant examinations or not, or where the Academic Board administering the course decides that further assessment is desirable before release of candidates final results, such results in either a particular subject or all of the subjects may be withheld at the discretion of the Academic Board until the candidates have fulfilled all requirements to the satisfaction of the Academic Board.

In such cases, the Registrar shall advise the student in writing to contact the Head of Department/School offering the subject to ascertain exact requirements to enable the final result to be issued. Except in the case of the Academic Board administering the course having decided that further assessment is desirable before release of a final result, the student shall be given the opportunity to show cause to the Registrar why the result should not be withheld.

(b) *Finalisation of Results*

Where a deferred examination or a supplementary examination is conducted as a Central Examination the Academic Board administering the course in which the student is enrolled must notify the Registrar of the final result within seven days of the date of the Central Examination.

In the case of all other unfinalised results, the Academic Board administering the course in which the student is enrolled must notify the Registrar of a final result, in the case of a result pertaining to the Spring semester, no later than the last Friday in January of the succeeding year, and in the case of a result pertaining to the Autumn semester, no later than two weeks after the commencement of the following Spring semester.

In exceptional circumstances and with the approval of the Academic Board, a result may remain unfinalised until the end of the sixth week of the succeeding semester. In such a case the Academic Board must inform the Registrar in writing of the reason for the delay in the finalisation of the result.

38. *Approval of Release of Results*

- (a) The Dean of Faculty shall certify to the Registrar the final results in respect of each candidate in the Faculty after all authorities have carried out their functions and exercised any powers given them under these Rules.

- (b) Following certification of results by the Dean of Faculty these will be released at the direction of the Registrar.

## **Part X. REVIEW OF RESULTS**

It is University policy that students may seek a Review of Results in final examinations. Final examinations include Central Examinations, Supplementary Examinations, Deferred Examinations and end of semester/end of year Departmental Examinations.

The University's minimum requirements to be applied in any such review are that marks originally given for each part of each question are consistent with the answer (as opposed to the Lecturer making a new judgement in isolation), that all sections have been marked, and that the aggregate marks for the paper were accurately compiled.

### **39. *Application for Review of Results in Central Examinations and End of Semester/End of Year Departmental Examinations***

The papers submitted by a candidate in any Central Examination, Supplementary Examination, Deferred Examination, end of semester/end of year Departmental Examination shall be reviewed on request lodged by the candidate with the Registrar not later than the date prescribed in the Calendar in the case of end of semester/end of year examinations, or within seven days of posting results in the case of Deferred or Supplementary Examinations, and on payment of a fee prescribed by the Council.

40. If, on review, a higher grade of pass or a pass in place of a failing grade is awarded to the candidate, the fee so paid shall be refunded.

## **Part XI. UNSATISFACTORY ACADEMIC PERFORMANCE**

The following Rules 41 to 46 apply only to students who are registered in an approved course of study. Unregistered Students must apply for enrolment each year and their applications may be accepted or rejected by the Registrar on the recommendation of the relevant Head of Department.

### **41. *Probationary Enrolment***

A student shall be placed on probationary enrolment if either -

- (a) the student has in the most recent semester failed a subject which has been failed previously;  
or
- (b) the student is on probationary enrolment and during that period of probationary enrolment has failed a subject which has been failed previously;  
or
- (c) the student has a weighted grade average of less than 3.0 in the course in which he or she is enrolled, provided that the weighted grade average in the most recent semester was at least 1.00;

- or
- (d) the student has during an academic year undertaken as part of the QUT course two or more subjects from an external institution and has failed more than half of such external subjects.

For the purpose of Rule 41(a) and 41(b) a subject is uniquely identified by the subject code. Where a subject code has been changed to indicate a change in the Faculty or department responsible for the subject, the subject will be deemed to be the same subject for the purpose of Rule 41(a) and (b).

The Registrar shall notify all students who have been placed on probationary enrolment.

#### 42. *Terms of Probationary Enrolment*

- (a) A student placed on probationary enrolment at the end of Autumn semester shall remain on probationary enrolment for the duration of the following Spring semester. A student placed on probationary enrolment at the end of Spring semester shall remain on probationary enrolment for the duration of the following Autumn and Spring Semesters.
- (b) If a student cancels or lapses enrolment while on probationary enrolment, any subsequent enrolment in that course shall be a probationary enrolment. For the purposes of Rule 43 the terms of probationary enrolment before and after the period of lapsed enrolment shall be counted as one period of probationary enrolment.
- (c) A student on probationary enrolment is required to enrol as the Head of Department directs.
- (d) The Registrar shall advise all students on probationary enrolment that they should discuss their progress with the Head of Department or his nominee.

#### 43. *Exclusion*

- (a) At the end of each academic year, the Academic Board responsible for the course shall review the academic performance of each student enrolled in the course.
- (b) The Academic Board may exclude a student from further enrolment in the course if the student is eligible for a second or subsequent period of probation in the course.
- (c) The Academic Board may exclude a student from further enrolment in all courses or a specified group of courses offered by the Faculty if the student is eligible for probationary enrolment and either has had at least two periods of probationary enrolment in courses offered by the University or has been excluded from another course offered by the University.
- (d) On the recommendation of the Academic Board the Academic Assembly may exclude a student from further enrolment in all courses offered by the University if the student is eligible

for exclusion from a course under Rule 43(b) and also has been excluded previously from a course in another Faculty.

- (e) The Registrar shall notify all students who have been excluded under Rule 43(b), (c) or (d) by registered mail.

#### 44. *Right of Appeal*

- (a) A student who is excluded under Rule 43 shall have the right of appeal to Council. All appeals against exclusion shall be lodged in writing with the Secretary of Council. Each letter of appeal must state the grounds and reasons for appeal and must be delivered or posted so as to reach the Secretary of Council within fourteen calendar days of the date appearing on the Registrar's letter advising the student of the exclusion.
- (b) Each appeal is forwarded in the first instance to the Academic Board which recommends to Council whether the appeal should be upheld or dismissed. Where the Academic Board recommends that the appeal be dismissed the appeal shall be considered by the Appeals Committee of Council, which shall recommend to Council whether the appeal should be upheld or dismissed.
- (c) When an appeal against exclusion is upheld, the student shall be placed on probationary enrolment for the remainder of the academic year under the terms set out in Rule 42.

#### 45. *Readmission After Exclusion*

- (a) A student excluded under these Rules may apply for and be considered for readmission. Such readmission shall not take place until at least four semesters have elapsed since exclusion.
- (b) An application for readmission after exclusion shall be made in writing to the Registrar no later than two months prior to the commencement of the semester in which readmission is sought.
- (c) Applications for readmission shall be considered by the Academic Board responsible for the course from which the student was excluded. In considering applications the Academic Board may take into account changed circumstances, for example, academic and/or vocational performance since exclusion, maturity and motivation.
- (d) A student readmitted under these rules shall be placed on probationary enrolment for the remainder of the academic year under the terms set out in Rule 42.
- (e) At the end of the academic year, the Academic Board shall review the academic performance of each student readmitted to the course during that year. If a student has obtained a Weighted Grade Average since readmission of less than 3.50, the student may be excluded under Rule 43.
- (f) If the student is permitted under Rule 43(e) to proceed with the course, in subsequent years the student is subject to Rule

41. For the purposes of Rule 41, subjects failed prior to the period of exclusion and the Weighted Grade Average prior to the period of exclusion shall be taken into account.

46. Maximum Time in Which to Complete an Award

- (a) In order to obtain an award, the student must successfully complete the requirements for the award as specified in the rules for the course within a maximum number of calendar years as set out below:

*Course - (Maximum Time)*

Bachelor degree level courses (excluding combined degrees) - (10 years)

Combined bachelor degree level courses - (11 years)

Diploma level courses (excluding post-basic nursing courses) - (10 years)

Post-basic Nursing diploma courses - (4 years)

Associate Diploma level courses - (7 years)

Post-graduate Diploma level courses with normal duration of one year full-time, or two years part-time - (4 years)

Post-graduate Diploma level courses with normal duration of three years part-time - (5 years)

Master degree level courses (course work) - (6 years)

Master degree level courses (by research and thesis) as prescribed in relevant course rules

For the purposes of Rule 46, the length of time over which the student has acquired credit in the course is taken as the elapsed time in calendar years from the first day of the semester in which the student completed a valid semester of enrolment to the most recent subject attempted in the course, exclusive of exemptions granted, irrespective of periods of exclusion or periods of absence whether approved or not.

- (b) If the time over which the student has acquired credit in the course equals the maximum time specified in Rule 46(a), and the student has not completed the requirements for the award, the student shall be excluded from further enrolment in the course.
- (c) The Registrar shall notify all students excluded under Rule 46(b) by registered mail.
- (d) A student who is excluded under Rule 46(b) shall have the right of Appeal to Council. All appeals against exclusion shall be lodged in writing to the Secretary of Council. Each letter of appeal must state the grounds and reasons for appeal and must be delivered or posted so as to reach the Secretary of Council within 14 calendar days of the date appearing on the Registrar's letter advising the student of exclusion.

- (e) Each appeal is forwarded in the first instance to the Academic Board which recommends to Council whether the appeal should be dismissed or whether the student should be permitted to continue enrolment in the course for a specified period provided that the student undertakes such subjects, special examinations or other requirements as the Academic Board may determine to be appropriate in order for the student to complete the requirements of the award. Where the Academic Board recommends that the appeal be dismissed, the appeal shall be considered by the Appeals Committee of Council. If the Appeals Committee recommends that the appeal be upheld, the appeal shall be referred back to the Academic Board to determine the conditions under which the student may complete the course requirements. The recommendation of the Academic Board and/or the Appeals Committee shall be forwarded to Council for approval.
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## **RULES RELATING TO THE APPEALS COMMITTEE**

### **1. General**

- (a) The Appeals Committee of Council will comprise -

Deputy Director (Chairman)

Three members of Council, one of whom shall be a student

Two academic staff from different Faculties appointed by the Academic Assembly

One student nominated by the QUT Union

Head of Counselling

- (b) The Committee will consider all appeals against the imposition of penalties under the provision of Rule 28(b), Rule 43 and Rule 46 of the University's General Examination Rules and will communicate its findings and recommendations in writing to Council for approval.
- (c) All appeals against the imposition of penalties under Rule 28(b), Rule 43 and Rule 46 of the University's General Examination Rules shall be lodged in writing with the Secretary of Council. Each letter of appeal must state the grounds and reasons for appeal and be delivered or posted so as to reach the Secretary of Council within fourteen (14) calendar days of the date appearing on the letter advising the students of the penalties imposed.

### **2. Appeals Under Rule 28**

- (a) In reaching its findings and recommendations, the Committee shall have regard only to the following matters -

- (i) whether the original decision to exclude the candidate from the University was correct in terms of the provisions of General Examination Rule 28;

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- (ii) whether the procedures set out in General Examination Rule 28 were properly carried out;
  - (iii) the severity or otherwise of the penalty imposed.
2. *Appeals Under Rule 43 and Rule 46*
- (a) An academic staff member on the Committee shall stand down from the Committee during the hearing of an appeal made by a student from the Faculty on which the staff member serves.
  - (b) In reaching its findings and recommendations, the Committee shall have regard only to the following matters -
    - (i) whether the penalty imposed under General Examination Rule 43 or Rule 46 complies with the provisions of that Rule and the policy of the relevant Academic Board in relation to that Rule;
    - (ii) whether the procedures set out in General Examination Rule 42 were properly carried out;
    - (iii) the severity or otherwise of the penalty imposed.
    - (iv) mitigating circumstances advanced by or on behalf of the student in the appeal.
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### **RULES RELATING TO NON-RELEASE OF EXAMINATION RESULTS**

1. Subject to the following Rules, the Registrar, acting on the recommendation of a Dean of Faculty, the Chief Librarian, the Computer Manager, the Bursar or other officer authorised by Council, may approve that a student's examination results for a specified semester or year not be published or released to the student. The student shall be advised in writing of the Registrar's decision.
2. A Dean of Faculty, the Chief Librarian, the Computer Manager, the Bursar or other authorised officer may recommend that a student's examination results not be published or released if, by the last day of a semester's examination period as prescribed in the University Calendar -
  - (a) the student fails to return to the University equipment which the student has borrowed from the University and which is overdue for return; or
  - (b) the student fails to meet a debt or obligation to the University where such class of debt or obligation has been deemed by the Council to warrant the non-release of examination results.
3. In these Rules the term 'equipment' means all physical stock including computer hardware and software, library books and other library materials.

4. The Registrar shall, upon receipt of advice from the Dean of Faculty, Chief Librarian, the Computer Manager, the Bursar, or other authorised officer that a student has returned all overdue items of equipment, made adequate restitution in lieu of the return of overdue equipment or met a debt or obligation to the University as defined in Rule 2(b) above, cause the student's examination results to be released as soon as is practicable.
  5. A student whose examination results have not been released, pursuant to a decision of the Registrar under these Rules, may appeal to the Vice-Chancellor against the decision of the Registrar. The appeal, setting out the grounds and reasons therefore, must be made in writing and be lodged with the Vice-Chancellor not more than fourteen days after the date appearing on the letter advising the student of the Registrar's decision.
  6. The Vice-Chancellor shall consider the appeal, making such enquiries as he or she deems necessary, and shall advise the student in writing of the results of the appeal.
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## **QUEENSLAND UNIVERSITY OF TECHNOLOGY LIBRARY RULES**

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1. Authority of Chief Librarian
2. Library Usage
  - (a) Entitled Users etc.
  - (b) Hours of Opening
  - (c) Rules for General Conduct
  - (d) Borrowing Responsibilities
  - (e) Loans
  - (f) Limited Access Collection
  - (g) Non-Loanable Materials
3. Penalties etc.
  - (a) General
  - (b) Reprimand
  - (c) Fines for Late Returns
  - (d) Loss of Borrowing Rights
  - (e) Lost Library Material
  - (f) Exclusion
4. Appeals
5. Library Copying and Copyright
6. Notices
7. Schedule of Service Charges

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## QUT MAIN LIBRARY RULES

### 1. *Authority of the Chief Librarian*

The Library shall be administered by the Chief Librarian. Subject to the overall control of the Vice-Chancellor and the University Council, the Chief Librarian shall -

- (a) Prescribe the procedures to be followed by Library users;
- (b) Exercise disciplinary authority with respect to the behaviour of users of the Library;
- (c) Exercise disciplinary authority with respect to the preservation, consultation and loan of library materials.

### 2. *Library Usage*

#### (a) *Entitled Users*

- (i) Subject as below, the Chief Librarian may permit any person to use any facility of the Library and determine the conditions under which such use is permitted. Failure to comply with any such conditions shall be a breach of these Rules.
- (ii) The following are entitled to use the Library for study and research -
  - Students of the University;
  - Staff of the University;
  - Members of the University Council;
  - Special users who are -
    - reciprocal users (as defined in written agreements with QUT);
    - any other person or group approved by the Chief Librarian.
- (iii) The Chief Librarian may make a charge to any user or users for library materials, services or other facilities, in accordance with the Schedule of Charges attached to these Rules. Any amendment to the Schedule of Charges is to be approved by the Vice-Chancellor and the University Council.
- (iv) Any person entitled or given approval to use any facility of the Library may be required to complete and sign a registration card undertaking to comply with the Rules.
- (v) Any person entitled or given approval to use any facility of the Library, and wishing to do so, must obtain a QUT Library Membership Card or a QUT Identity Card, whichever is appropriate.

#### (b) *Hours of Opening*

The hours during which the Library shall be open shall be prescribed by shall be open shall be prescribed by the Chief Librarian, subject to the approval of the Vice-Chancellor,

and posted at the entrance to the Library. Prior notice through normal University channels will be given of any change in the hours of opening.

(c) *Rules for General Conduct*

- (i) No person shall in the Library behave in a manner which, in the reasonable opinion of any Librarian on duty, is not a proper manner and a proper use of the Library, or which interferes with the comfort or convenience of, or the use of the Library by other persons.
- (ii) No person may eat or drink in the Library except in such areas as are specifically set aside by the Chief Librarian for any of these purposes. No animals may be brought into the Library.
- (iii) Bags, cases or other material may be brought into the Library, but must be offered for inspection on leaving the Library if requested by a member of the Library staff.
- (iv) No person may reserve a seat in a general reading area, except in Closed Carrels. Articles left unattended in the Library for more than 30 minutes may be removed by Library staff. The University, Chief Librarian and Library staff shall have no responsibility for personal belongings left in the Library.
- (v) An atmosphere of quiet must be maintained in the Library so that it is at all times a place conducive to independent study and quiet reading. Silence must be kept in the main reading areas and conversation restricted to the Seminar rooms and other specified areas.

(d) *Borrowing Responsibilities*

- (i) A current Identity Card is necessary for borrowing Library materials and should be carried at all times.
- (ii) A borrower is responsible for safe-keeping and return of the materials borrowed by him or her from the Library.
- (iii) All borrowers must complete the appropriate procedures for each item borrowed.
- (iv) All items on loan must be returned on or before the last date stamped on the date due slip or where appropriate, before the expiration of a recall notice.
- (v) Names of borrowers will not be revealed without the borrower's consent.
- (vi) Borrowers are responsible for notifying the Library of any change of address.

(e) *Loans*

- (i) Restrictions may be placed on the number of items

which a user may have on loan at any one time.

(ii) *Books*

The usual loan period for books is four (4) weeks, normally renewable once. From time to time, certain items may be placed in the Limited Access Collection (i.e. for use only in the Library) or on Short Term Loan (i.e. for a one (1) week non renewable loan period).

In addition, loan periods for certain items may be adjusted in accordance with patterns of use in an effort to ensure equitable distribution.

(iii) *Extended Book Loans*

With the approval of the Chief Librarian, full-time academic staff may borrow, for one extended period only, books required in the planning of courses or subjects. Requests for extended loans must be submitted in writing. Extended loans will not be renewed. Extended loans normally will be from 1st December to 31st July of the following year, or from 1st June to 30th November of the same year.

(iv) *Periodicals*

Unbound issues of periodicals (other than current issues or issues on display) may be borrowed by staff for one week. Loans of periodicals are not renewable. Monographic Series (e.g. *Advances in . . .*) may be borrowed by staff and students for one week. Loans of Monographic Series are not renewable.

(v) *Audio-Visual*

Most types of audio-visual materials, with the exception of films and video, may be borrowed for two (2) weeks by staff and students.

Films and video may be borrowed by staff only for a period of one (1) week.

Audio-visual loans are not normally renewable.

(f) *Limited Access Collection*

(i) Only QUT students and staff and other persons approved by the Chief Librarian may use the Limited Access Collection.

(ii) No items borrowed from the Limited Access Collection may be removed from the Library, except as specified in Clause 2(f)(iv) below.

(iii) The Normal loan period is two (2) hours which is renewable if demand permits. Overnight loans are permitted from half an hour before closing time until half an hour after opening time the next day.

(iv) Students and staff must leave their QUT Identity Card as a deposit before being permitted to remove any item from the Limited Access Collection.

(g) *Non-Loanable Materials*

Non-loanable materials are as follows -

- (i) Reference works;
- (ii) Maps and Charts;
- (iii) Theses;
- (iv) Bound volumes of periodicals;
- (v) Newspapers;
- (vi) Other designated special collections.

3. *Penalties etc.*

(a) *General*

- (i) A charge under these Rules shall be a debt to the University.
- (ii) Subject as below, penalties ie. reprimand, fines, withdrawal of borrowing privileges, exclusion from the library or other specified sanction, for breaches of these Rules may be imposed by the Chief Librarian on any user.
- (iii) Penalties (as specified in 3(a)(ii) above) may be waived by the Chief Librarian in special circumstances.
- (iv) The Registrar, acting on the recommendation of the Chief Librarian, may refuse to publish or release a student's examination results for a specified semester or year when the student fails to return a borrowed item which is overdue or fails to meet a debt to the University.

(b) *Reprimand*

Failure to observe these Rules may incur a reprimand from the Chief Librarian or the Senior Librarian on duty, together with a warning against repetition of the offence.

(c) *Fines for Late Returns*

- (i) *All loans other than Limited Access or Short Term Loans*
  - When a item is overdue, an overdue notice will be sent to the borrower;
  - If an item is returned late, a fine will be imposed at the rate of 25c. for each day that the item is overdue from the date due, up to a maximum of \$25.00.
- (ii) *Limited Access Collection Loans*

A fine of 50c. per hour will be imposed for each hour or part thereof that an item is late, up to a maximum of \$25.00.
- (iii) *Short Term Loans*

A fine of 50c. per day, per item, will be imposed for each day the item is late, up to a maximum of \$25.00.

(d) *Loss of Borrowing Rights*

A user's borrowing rights may be withdrawn if one item or more is overdue. Once borrowing rights have been removed they will not be restored until the overdue item/items are returned and the accrued fines are paid.

(e) *Library Material Lost or Damaged in the Care of the Borrower*

(i) *Lost Material*

If an item appears to be lost, the loss must be reported to the Lending Services Desk Clerk or the Lending Services Librarian. If an item is not returned within 5 weeks of the date stamped on the due date slip, the item is presumed lost. If after a reasonable search by both Librarian and borrower the item cannot be found and proof of return cannot be shown, the borrower shall be responsible for the replacement cost plus a processing charge of \$10.00 per item, up to a maximum of \$100 per item, to be paid within 14 days of date of notification.

(ii) *Damaged Material*

If an item is returned from loan damaged, the borrower shall be responsible for its replacement cost, whether of the whole or part of the item, together with a processing charge of \$10.00 up to a maximum of \$100.00 per item, to be paid within 14 days of notification.

(f) *Exclusion*

- (i) Any person who fails to observe these Rules or who disfigures or damages any document or other Library facility may be excluded from the Library for up to one semester and shall be responsible for any damage caused.

4. *Appeals*

- (a) Any person upon whom a penalty (as defined in 3(a)(ii) hereof) has been imposed may, within fourteen (14) days of the imposition, challenge the imposition of the penalty and/or appeal against the imposition of the penalty, and any action which may be taken under Section 3 will be suspended pending determination of the challenge or appeal.
- (i) Any challenge or appeal should in the first instance be made in writing to the Registrar.
- (ii) An appeal against a decision of the Registrar must be made in writing within seven (7) days to the Vice-Chancellor.
- (iii) On appeal, the Registrar or the Vice-Chancellor, as the case may be, if there are extenuating or exceptional circumstances, may allow the appeal or reduce or waive the penalty.

5. *Library Copying and Copyright*

(a) *Permissible Copying*

Unless otherwise permitted by the Copyright Act 1968, unauthorized copying of a work in which copyright subsists may infringe the copyright in that work. A copyright owner is entitled to take legal action against a person who infringes his or her copyright.

Under Section 40 of the Copyright Act 1968, it is a fair dealing to make a single copy, for the purpose of research or study, of one or more articles on the same subject matter in a periodical publication or, in the case of any other work, of a reasonable portion of a work. In the case of a published work that is of not less than 10 pages and is not an artistic work, 10% of the total number of pages, or one chapter, is a reasonable portion.

Certain University copying facilities are designated as 'multiple copying facilities'. These 'multiple copying facilities' are situated within the University Library, the Printing Centre and the Faculty of Law only and specifically identified on an adjacent notice.

(b) *Non-Copyright Material*

There is no restriction on the copying of non-copyright material. Aside from personal papers, readers may be required to establish that the copies they have made are non-copyright matter. In some cases a statement is made on a publication permitting copying. Otherwise readers should assure themselves BEFORE making copies that they have the necessary authority OR are acting within the meaning of the Copyright Act 1968.

6. *Notices*

Any notices to be given to a person under these Rules shall be deemed to be sufficiently given if sent to him or her by mail at his or her address registered with the Library and shall be deemed to have been received by the person to whom it is addressed in the ordinary course of the post.

## 7. Schedule of Service Charges

Service	User Category	Conditions	
1. Literature (Citation) Searching on online systems	QUT Staff	No charge, subject to the search being for QUT teaching or QUT supported research.	
	(a) Comprehensive	QUT Postgraduates	No charge, provided searches approved by the Head of Department as being an essential part of a program of study.
		QUT Undergraduates	If engaged in major project as for postgraduates. Otherwise, as for non QUT
		Non-QUT	<i>Overseas databases</i> - \$7.00 per minute of keyboard time plus print costs. <i>Australian databases</i> - \$5.00 per minute of keyboard time, plus print costs.
(b) Limited	QUT Staff and students	\$15.00 per search (minisearch) \$30 per search (basic search)	
2. Numeric data searching on online systems	QUT staff and students (as in 1(a))	No charge, subject to the search being for QUT teaching or QUT supported research	
	Non QUT	\$35.00 base charge plus \$7 per minute keyboard time and offline plot costs	
3. Manually prepared Bibliographies	QUT staff and students	No charge, subject to the search being for QUT teaching or QUT supported research	
	Non QUT	By negotiation (based on preparation time)	
4. (a) Loans (other than films) from QUT	QUT staff and students	No charge	
	QUT Graduates	\$15.00 per year	
	Non QUT individuals	\$20.00 per year	
	Companies (up to 3 borrowing)	\$50.00 per year	
(b) Loans (film)	QUT staff - teaching purposes	No charge	
	QUT staff - Continuing Education & Consultancy	\$25	

	Other specified tertiary institutions	Reciprocal Arrangements
	Other organisations	\$25
	QUT students	Not available
	Non QUT individuals	Not available
(c) Obtaining materials held by QUT Library	QUT staff	Services provided in special circumstances
	QUT students	Cost subject to negotiation
	Non QUT	\$6 per item
(d) Obtaining materials not held by QUT Library	QUT staff	No charge, subject to loan being for QUT teaching or QUT supported research
	QUT students	No charge. (Request must be supported by supervising academic staff member)
	Non QUT	\$10.00 plus costs for first request, \$5.00 plus costs for each subsequent
(e) Loans (film) from other collections	QUT staff - teaching purposes	No charge
	QUT staff - Continuing education & Consultancy	\$25 plus costs
	QUT students	Not available
	Non QUT	Not available
5. Online access to QUT Library data base	QUT staff and students	No charge subject to access being for QUT teaching or QUT supported research
	Non QUT	\$20 per hour connect time
6. Other services		
(a) Workspace facilities	QUT staff and students	No charge, provided room is wanted for QUT teaching or QUT supported research
	Non QUT	Charge per half day at discretion of Chief Librarian
(b) Displays	QUT staff and students	No charge for displays time to QUT teaching or QUT supported research
	Non QUT	By negotiation

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## FACULTY OF LAW LIBRARY RULES

### 1. *Definition*

In these rules the word 'Library' means the Law Faculty Library.

### 2. *Administration*

The Library shall be administered in accordance with these Rules by the Law Faculty Librarian under the direction of the Dean of the Faculty of Law.

### 3. *Reference Library*

The Library shall be a reference Library and, except in the case of material required for use in a Law Faculty Moot, or in any case approved by the Dean of the Faculty of Law, Library material or equipment shall not be removed from the Library.

### 4. *Hours of Opening*

The hours during which the Library shall be open shall, after consultation with the Chief Librarian, be prescribed by the Dean of the Faculty of Law, subject to the approval of the Vice-Chancellor, and shall be posted at the entrance to the Library. Prior notice shall be given of any change in the hours of opening.

### 5. *Library Users*

(a) The following persons shall be entitled to use the Library for study and research -

- (i) students of the University;
- (ii) staff of the University;
- (iii) members of the Council of the University;
- (iv) any other person approved in advance by the Dean of the Faculty of Law.

(b) Any person seeking approval to use the Library under Rule 5(a)(iv) must apply in writing to the Dean of the Faculty of Law.

(c) Any person wishing to use the Library must possess a QUT identity card or the written approval of the Dean of the Faculty of Law, whichever is appropriate, and must produce such card or approval upon request by the person on duty at the Reader Assistance desk.

### 6. *Conduct of Library Users*

(a) Briefcases and bags must not be taken into the Library. On leaving the Library, all material shall be offered for inspection at the request of the person on duty at the Reader Assistance desk.

(b) No person shall reserve a seat in the Library except in the discussion rooms. Articles left unattended in the Library for more than one hour may be removed by any member of the staff on duty in the Library.

(c) No person shall use more than five items of Library material at any carrel or table at a time.

- (d) Neither the Council of the University nor any of its employees shall be responsible for the safekeeping of personal belongings of Library Users.
- (e) No person shall smoke, eat or drink in the Library.
- (f) No person shall in the Library conduct himself in a manner which, in the opinion of the Law Faculty Librarian, the Assistant Librarian or the person on duty at the Reader Assistance desk, is not a proper manner and a proper use of the Library, or which interferes with the comfort or convenience of, or the use of the Library by, other persons.
- (g) No person shall mark, deface or otherwise damage or destroy any Library material, equipment, furniture or other property, or any part of the Library.

#### 7. *Limited Access Collection*

Subject to Rule 3, a person entitled to use the Library may, upon application to the person on duty at the Reader Assistance desk and upon surrendering his QUT identity card or the written approval referred to in Rule 5(c), whichever is appropriate, as a deposit, use not more than two items from the Limited Access Collection for up to two hours at a time.

#### 8. *Moots*

In the case of a Law Faculty Moot, authorised by the Dean of the Faculty of Law, the Law Faculty Librarian or the Assistant Librarian may allow material to be removed from the Library for use in such Moot.

#### 9. *Copying and Copyright*

No person shall use any photocopier in the Library for a purpose which infringes copyright under the Copyright Act, 1968 (Cth). (The relevant sections of such Act are posted near each photocopier and a copy of the Act may be obtained on application at the Reader Assistance desk).

#### 10. *Penalties*

- (a) Any person who commits a breach of any of Rules 3, 5, and 6 may be reprimanded and warned against repetition of the breach, and/or excluded from the Library for a specified period not exceeding seven days, by the Law Faculty Librarian, the Assistant Librarian or the person on duty at the Reader Assistance desk.
- (b) Any person who commits a breach of Rule 7 may be reprimanded and warned against repetition of the breach, and/or his privilege of using items from the Limited Access Collection may be withdrawn for a specified period not exceeding seven days, by the Law Faculty Librarian, the Assistant Librarian or the person on duty at the Reader Assistance desk.
- (c) Any person who marks, defaces or otherwise damages, or

destroys, any Library material, equipment, furniture or other property, or any part of the Library shall be liable for the cost of making good the damage or replacing the property, such cost to be determined by the Law Faculty Librarian.

- (d) Any person who imposes any penalty under Rule 10(a), (b) or (c) must, as soon as practicable thereafter, notify the Dean of the Faculty of Law in writing.

#### 11. *Appeals*

- (a) Any person who is excluded from the Library or whose privilege of using items in the Limited Access Collection is withdrawn or who is liable for the cost of making good damage or replacing property under Rule 10 may, within seven days thereafter, appeal to the Dean of the Faculty of Law against the penalty, whereupon the penalty shall be suspended pending the determination of the appeal.
- (b) On such an appeal as is provided for by Rule 11(a) the Dean of the Faculty of Law may allow the appeal or dismiss the appeal or reduce or waive the penalty.
- (c) Any person who is excluded from the Library or whose privilege of using items in the Limited Access Collection is withdrawn or who is liable for the cost of making good damage or replacing property under Rule 10 who appeals to the Dean of the Faculty of Law and is dissatisfied with the decision of the Dean of Faculty may, within seven days thereafter, appeal to the Vice-Chancellor against such decision, whereupon the penalty shall be suspended pending the determination of the appeal.
- (d) On such further appeal as is provided for by Rule 11(c) the Vice-Chancellor may allow the appeal or dismiss the appeal or reduce or waive the penalty.

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## STUDENT GUILD FEE RULES

### 1. *Interpretation*

In these Rules unless the context otherwise indicates or requires:

'*Full-time Student*' means a student, including a member of staff of the University, who is enrolled at the University as a full-time student or such other person or persons as the council may from time to time determine.

'*Part-time Student*' means a student, including a member of staff of the University, who is enrolled at the University as a part-time student or such other person or persons as the council may from time to time determine.

'*Sandwich Student*' means a student, including a member of staff of the University, who in a particular academic year is enrolled at the University on the basis of attendance on a full-time basis for

one of two semesters, and is required to undertake specified practical training, with or without, part-time study for the remaining semester.

'*Guild Fees*' means such fees as may be prescribed by the Council for membership of the Queensland University of Technology Student Guild.

'*Enrolment*' means application for registration as a student of the University, and includes both New Enrolments and Re-enrolments.

## 2. *Fees to be Paid*

Unless the Council otherwise directs, Guild Fees shall be paid at the time of submitting an enrolment or re-enrolment, on or before the following dates:

- (a) in the case of a student applying for re-enrolment or of a student applying for enrolment for the first time in a post-graduate course by the date indicated in the University Calendar.
- (b) in the case of a student applying for enrolment for the first time in a bachelor degree, diploma, or associate diploma course -by the date specified on the Acceptance of Offer Form forwarded to the student.

## 3. *Consequences of Non-payment*

- (a) If Guild Fees payable by a student have not been paid at the time of lodging an enrolment, the Registrar may refuse to accept such enrolment.
- (b) Any student whose enrolment is not accepted under the provisions of Sub-Rule (a) of this Rule may re-apply for enrolment, up to and including the final date for submission of late enrolments as specified in the University Calendar, subject to the conditions specified in Sub-Rule (a) of this Rule.
- (c) Without limiting the effect of Sub-rule (a) of this Rule, a student who has not paid all Guild Fees due and payable by him and who satisfies the Registrar that he is unable to make payment by the date specified for fees to be paid, may be granted an extension of time in which to pay such fees, and may have his enrolment accepted, subject to his agreeing to pay all fees not later than the extended date indicated by the Registrar.
- (d) Where a student has lodged an enrolment with the Enrolments Section of the University and Guild Fees due and payable by the student have only been paid in part, the Registrar may refuse to accept or process such enrolment, unless the balance of fees, notified to the student on a Fee Payment Form, have been paid by a date determined by the Registrar and notified to the student.
- (e) Without limiting the effect of any of the preceding Sub-Rules of this Rule, if Guild Fees payable by a student remain unpaid within five weeks of the commencement of the first

semester of the academic year in respect of which they are payable, the Registrar may cancel such student's enrolment at any time thereafter.

4. *Refund of Fees on Voluntary Cancellation of Enrolment*

A student who not later than six weeks after the first day of a semester gives proper written notice to the Registrar of withdrawal of his enrolment shall be entitled to a refund of the Guild Fees. Such refund shall be made by the University on behalf of the QUT Student Guild upon the surrender of any current QUT Student Card.

## SCHEDULE OF CHARGES AFFECTING STUDENTS

1. *Guild Fees*

Full-time students .....	\$100.00 p.a.
Part-time internal students .....	\$50.00 p.a.
Part-time external students .....	\$7.00 p.a.
Sandwich course students .....	\$50.00 p.a.
All other members .....	\$50.00 p.a.

An unregistered student shall be required to pay the appropriate full-time or part-time fee corresponding to his attendance status.

A student undertaking a thesis only shall be required to pay the appropriate full-time or part-time fee corresponding to his attendance status.

2. *Admission, Enrolment and Examination: Council has approved the following Schedule of Charges -*

Late lodgement of Enrolment Application - for applications received after the closing date set out in the University Calendar .....	\$30.00
Charge for adding a subject to study program or substituting one subject for another in study program after the final date for additions and substitutions set out in the University Calendar .....	\$20
Refundable Deposit for review of Special Consideration decision .....	\$20.00
Review of Examination Results .....	\$6.00 per paper with a maximum of \$12 per subject

Statement of Academic Record

Each student shall be entitled to receive an official statement of Academic Record free of charge at the time of graduation.

Statements supplied at any other time .....	\$5.00 per copy
Re-issue of Identity Card .....	\$3.00

Charge for obtaining a student identity card (other than a reissue) after March 30 .....	\$10
(this charge will be waived for students who do not enrol until Spring Semester)	
Re-Issue of Award Certificate .....	\$15.00
Re-Issue of Receipt for fees paid .....	\$2.00

3. *Deposit System for Use of Laboratory Facilities*

- (a) A student enrolled in any subject included in the 'Schedule of Subjects relating to Laboratory Deposits' which the Registrar may vary from time to time, shall deposit \$50 for the use of laboratory facilities.
  - (b) A student shall be required to pay only one deposit irrespective of the number of such subjects included in an enrolment.
  - (c) At the end of the year the deposit shall be refunded to the student less the cost of any breakages which have not been made good.
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## **PARKING REGULATIONS**

Council has approved regulations relating to the parking of motor vehicles on campus.

- (a) A member of staff or a student shall not be permitted to park a vehicle within the grounds of the University unless such person has previously made application for a parking permit and this permit has been granted.
  - (b) The privilege of parking within the grounds shall be subject to such conditions as may be imposed at the time the permit is issued to the applicant.
  - (c) An application for permission to park a vehicle within the grounds of the University shall be made on a form prescribed and available at the University Security Office.
  - (d) For a breach in the parking of a vehicle the Vice-Chancellor may revoke the permit for a specified period or for the remainder of the academic year.
  - (e) For a breach by a person not possessing a parking permit in the parking of a vehicle, the Vice-Chancellor may arrange for the vehicle to be removed from the grounds of the University and the person shall be required to pay the cost of such removal.
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## **Articulation between QUT and Queensland TAFE Courses**

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## ARTICULATION BETWEEN QUT AND QUEENSLAND TAFE COURSES

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The growth of the tertiary sector in Queensland is dependent upon the continuance of the education of people who can contribute to the needs of society. Associate Diploma students from TAFE and other tertiary institutions, as well as certain TAFE Certificate students, are encouraged to continue their studies at degree and diploma level at QUT. To ensure that prior studies are given adequate recognition, QUT has reviewed its policies on both the admission of and exemptions given to TAFE applicants. The review process is dynamic and both Queensland TAFE and QUT will continue to monitor the progress of students admitted to QUT courses and the credit given to such students based on previous TAFE studies.

### 1. *Entry to QUT*

All applicants must apply through the Queensland Tertiary Admission Centre by the closing date. Entry to all QUT courses is on the basis of competition and quota restriction applies equally to Grade 12 students, Certificate and Associate Diploma holders. QUT publishes Tables in its Admissions Procedures Book which indicates the Selection or Notional Tertiary Entrance Score that will be given to applicants with Certificate and Associate Diploma studies. These tables are based on performance. The better the grades achieved the better the chance applicants have of negotiating QUT quotas.

Entry is also dependent upon applicants having appropriate pre-requisite subjects within their background. This means that an applicant for a degree in engineering at QUT usually would have appropriate pre-requisites if the previous course of study was in the field of engineering but would not necessarily meet the pre-requisites by holding an Associate Diploma in Business. The engineering Associate Diploma holder would usually be eligible for a degree in business at QUT, as would usually the holder of an Associate Diploma in Business. In any case, placement in the QUT course would still be dependent upon negotiating the quota. The quota cut-off level of the previous year's intake is published in the QUT's 'Admission Procedures' Book.

### 2. *Credit for Previous TAFE Associate Diploma*

Once a student has gained a place in the quota through QTAC, credit is given to the student based on previous study undertakings. QUT Faculty Boards have looked at TAFE Associate Diploma syllabi and have determined appropriate levels of credit from QUT courses based on the content of the TAFE subjects. Initially, credit will only apply to applicants who have completed all of the TAFE course. QUT Faculties have adopted varying attitudes towards the amount of credit that will be given for previous courses and as indicated above the level of credit will be reviewed over time.

### 3. Specific Credit Given at QUT for Completed TAFE Courses

<b>TAFE Course</b>	<b>QUT Course Equivalent</b>
<b>Built Environment Area</b>	
CNJ74 Associate Diploma of Applied Science - Architectural Technician	ARJ192 Bachelor of Architecture Block exemption Semesters 1 and 2 BTJ227 Bachelor of Applied Science - Built Environment Block exemption Semester 1
CNJ45 Associate Diploma of Applied Science - Building	BGJ201 Bachelor of Applied Science - Building Exemption from subjects: BGB151, 152, 251, 141, 241, 242, 243, BGB340, 345, 405, MAB297, CMB134, SVB101
<b>Business Studies Area</b>	
Associate Diploma of Business:	Bachelor of Business:
CNJ13 General	ACJ151 Accountancy
CND71 Accountancy	CMJ153 Communication
CND25 Computing	MNJ152 Management
CND74 Management	MNJ154 Public Administration
CND93 Marketing	MNJ179 Health Administration
CND97 Purchase and Supply	The Faculty of Business must accredit individual programs before granting credits. However, the faculty may give exemptions to the extent of one year of full-time study drawn from either core, specialist or elective subjects. Credit may not be claimed for more than half of any specialist/strand area. The granting of any exemption will be conditional upon the meeting of any pre-requisite material contained in other subjects.
CND99 Transport Administration	
CNC54 Operations Management	
CNL04 Aboriginal and Torres Strait Islander Administration	
<b>Computing/Information Management Area</b>	
CND25 Associate Diploma of Business - Computing including subjects: TSM128, 892, 893, 856, 503	ISJ210 Bachelor of Business - Computing CSJ128 Bachelor of Applied Science - Computing Block exemption from all subjects of the common first year.
<b>Engineering Area</b>	
Associate Diploma of Engineering	Bachelor of Engineering
CN548 Coal Mining	CEJ156 Civil Engineering
CN420 Electrical and Electronics	EEJ157 Electrical Engineering
CNG61 Electrical Systems	MEJ158 Mechanical Engineering
CN759 Mechanical	Application will have to be made for credit from individual subjects but in general exemptions will be given for up to one full-time year of study.

**Engineering Area (cont.)**

**Preparatory Courses**

CN649 Engineering Bridging Course  
(completion of bridging course guarantees entry to engineering associate diploma at QUT)

**Associate Diploma Courses**

CEL187 Associate Diploma in Civil  
Exemption from subjects MET120, 141,  
CET135, EET790, SVT306  
plus 1 elective  
EEL188 Associate Diploma in Electrical  
Exemption from subjects MET101, 600,  
MET601, 201, CST390, EET111, 211  
MEL189 Associate Diploma in  
Mechanical  
Exemption from subjects MET120, 220,  
MET140, 250, 210, 310

**Science Area**

**Associate Diploma of Applied Science**

CN440 Geology  
CN654 Primary Metallurgy  
CN758 Sugar Technology  
CNK82 Hydrology

**Bachelor of Applied Science**

ASJ226 Bachelor of Applied Science  
with majors in biology, chemistry,  
biochemistry, microbiology, geology,  
mathematics, physics

Credit may be given to the equivalent of one year of full-time study. Exemption will be on a subject by subject basis.

**Academic Board  
Standing Committees**



## ACADEMIC BOARD

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### SCIENCE ACADEMIC BOARD

Chairman: Dr R B Gardiner

Members: Dr A Bailey  
Dr J Dale  
Mr E P Dawson  
Dr S F Dyke  
Dr R G Everson  
Dr D W Field  
Mr P Finimore  
Dr R L W Frost  
Dr R N Gould  
Dr L H Hamilton  
Dr C R King  
Dr P B Mather  
Mr I F Ogle  
Mrs J Osborne (Graduate Representative)  
Mr W F Ridley  
Ms P Rowntree  
Mr G G Shorten  
Dr B W Thomas  
Mr M Wilkes (Student representative)  
vacancy for one student representative

Ex-Officio: Deputy Director  
Dean, Faculty of the Built Environment  
Dean, Faculty of Business  
Dean, Faculty of Information Technology  
Dean, Faculty of Engineering  
Dean, Faculty of Health Science  
Dean, Faculty of Law  
Chairman, Graduate Studies Standing Committee

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 COURSE ASSESSMENT COMMITTEES
 

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BACHELOR OF APPLIED SCIENCE,  
 BACHELOR OF APPLIED SCIENCE (APPLIED CHEMISTRY),  
 BACHELOR OF APPLIED SCIENCE (APPLIED GEOLOGY),  
 BACHELOR OF APPLIED SCIENCE (MATHEMATICS),  
 ASSOCIATE DIPLOMA IN APPLIED SCIENCE,  
 MASTER OF APPLIED SCIENCE (ANALYTICAL CHEMISTRY)

Dr R B Gardiner (Chairman)	Dean, Faculty of Science, QUT.
Dr P W Alexander	Senior Lecturer, Department of Analytical Chemistry, University of New South Wales.
Mr R J Allen	Former Chief Geologist, Geological Survey, Queensland Department of Mines.
Dr J R Bird	Head, Nuclear Physics Section, Australian Nuclear Science & Technology Organisation, Lucas Heights.
Dr R Borland	Head, Division of Life Sciences, RMIT.
Dr A F Egan	Principal Research Scientist, Microbiology, CSIRO, Division of Food Research, Brisbane.
Mr P L Ellis	Director, Department of Industry Development, Brisbane.
Dr D W Field	Course Coordinator, Faculty of Science, QUT.
Professor C C Heyde	Head, Department of Statistics, Australian National University, Canberra.
Mr J P McGilvray	Director, Division of Health & Medical Physics, Department of Health, Brisbane.
Dr D J Minson	Chief Research Scientist, CSIRO, Division of Tropical Crops & Pastures, Brisbane.
Dr W E Razzell	Director, Scientific Services Branch, Department of Water Supply & Sewerage, Brisbane City Council.
Dr J L Reichelt	Director, Genesearch Pty Ltd, Gold Coast Technology Park.
Dr A J Swain	Principal Biometrician, Department of Primary Industries, Brisbane.
Mr L N Wall	Managing Director, Febriwood Pty Ltd, Brisbane.
Mr R W Yerbury	Consultant, former Managing Director, Australian Laboratory Services Pty Ltd, Brisbane.

MASTER OF APPLIED SCIENCE - MEDICAL PHYSICS,  
DIPLOMA OF APPLIED SCIENCE - DIAGNOSTIC RADIOGRAPHY,  
DIPLOMA OF APPLIED SCIENCE - THERAPEUTIC RADIOGRAPHY

Dr R B Gardiner (Chairman)	Dean, Faculty of Science, QUT.
Prof H Baddeley	Head, Department of Radiology, University of Queensland.
Mr K Clarke	Head, Department of Physical Sciences, Melbourne Cancer Institute.
Mr M T Enright	Chief Radiographer, Mater Public Hospital, Brisbane.
Dr B Kynaston	Director, Queensland Radium Institute, Brisbane.
Mr R N McCartney	Senior Lecturer, Department of Applied Physics, RMIT.
Mr J P McGilvray	Director, Division of Health & Medical Physics, Department of Health, Brisbane.
Dr K S Mowatt	Formerly Director, Queensland Radium Institute, Brisbane.
Dr B W Thomas	Head, Department of Physics, QUT.
Dr D J Waggett	Director, Department of Physical Sciences, North Brisbane Hospitals Board.
Mr I S Wilkey	Assistant Director-General (Scientific Support Services), Queensland Department of Health, Brisbane.

## GRADUATE DIPLOMA IN QUALITY

Dr R B Gardiner (Chairman)	Dean, Faculty of Science, QUT.
Mr J D Armit	Manager, Laboratories, Bond Brewing Qld. Ltd, Brisbane.
Mr K C Crellin	Associate Director, Cameron McNamara Pty Ltd, Brisbane.
Mr N Frost	Queensland Manager, Gilbert Lodge & Co Pty Ltd, Brisbane.
Dr P Mansour	Lecturer, School of Management, QUT.
Mr A B Marshall	Manager & Principal Consultant, Q A Consultancy Services, Brisbane.
Mr I F Ogle	Lecturer, Department of Mathematics, QUT.

Mr R S Richards	Quality Control Manager, Cadbury Schweppes Aust Ltd, Melbourne.
Mr G Srikanthan	Senior Lecturer, Department of Mechanical & Production Engineering, RMIT.
Mr J A Wernham	State Director, Department of Industry, Technology & Commerce, Brisbane.
Dr W C K Wong	Head, School of Mechanical & Manufacturing Engineering, QUT.

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 CONSULTATIVE COMMITTEES
 

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BIOLOGY

Dr D J Minson (Chairman)	Chief Research Scientist, CSIRO Division of Tropical Crops & Pastures, Brisbane.
Dr A Bailey	Head, Department of Biology, QUT.
Dr W A Dodd	Strand Coordinator - Bachelor of Applied Science, QUT.
Dr A Egan	Principal Research Scientist, Division of Food Research, CSIRO, Brisbane.
Dr R B Gardiner	Dean, Faculty of Science, QUT.
Mr B Hildred	Valbri Nursery, Warwick.
Ms V O'Brien	(Graduate), Forestry Laboratories, Brisbane.
Dr J L Reichelt	Director, Genesearch Pty Ltd, Gold Coast Technology Park.
Mr N White	(Graduate), Lecturer, Department of Biology, QUT.
Dr C King	Strand Coordinator - Associate Diploma in Applied Science, QUT.

CHEMISTRY

Mr R Yerbury (Chairman)	Consultant, Former Managing Director, Australian Laboratory Services Pty Ltd, Brisbane.
Dr P W Alexander	Senior Lecturer, Department of Analytical Chemistry, University of NSW.
Mr T Beckmann	Director, Government Chemical Laboratory, Brisbane.
Mr G E Casley	Consultant Metallurgist, MIM Holdings, Brisbane.
Dr A Clark	Research Manager, Ampol Research & Development Laboratory, Brisbane.
Mr F I Coates	Former Technical Services Superintendent, Boyne Smelters Ltd, Gladstone.
Mr H M Dunn	(Graduate) Chemist, Quality Control Department, Castlemaine Perkins Ltd, Brisbane.
Dr S F Dyke	Head, Department of Chemistry, QUT.

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Dr R B Gardiner	Dean, Faculty of Science, QUT.
Dr G A George	Strand Coordinator - Bachelor of Applied Science, QUT.
Dr P Hallman	Course Coordinator - Master of Applied Science - Analytical Chemistry, QUT.
Mr E O'Reilly	Course Coordinator - Bachelor of Applied Science - Applied Chemistry, QUT.
Dr G Smith	Strand Coordinator - Associate Diploma in Applied Chemistry, QUT.

#### MICROBIOLOGY/BIOCHEMISTRY

Dr A F Egan (Chairman)	Principal Research Scientist, Division of Food Research, CSIRO, Brisbane.
Dr C S Barnes	Research Manager, The Baxter Centre for Medical Research, Sydney.
Mr E A Bennett	Strand Coordinator - Bachelor of Applied Science, QUT.
Mr P J Blackall	Senior Microbiologist, Animal Research Institute, Brisbane.
Dr R Borland	Head, Division of Life Sciences, RMIT.
Dr J Dale	Principal Lecturer, Department of Medical Laboratory Science, QUT.
Dr R B Gardiner	Dean, Faculty of Science, QUT.
Dr H E Kunze	Director of Chemical Pathology, Princess Alexandra Hospital, Brisbane.
Dr W E Razzell	Director, Scientific Services Branch, Department of Water Supply & Sewerage, Brisbane City Council.
Dr J S Welch	Head, Department of Medical Laboratory Science, QUT.

#### GEOLOGY

Mr L N Wall (Chairman)	Managing Director, Febrivood Pty Ltd, Brisbane.
Mr R J Allen	Former Chief Geologist, Geological Survey, Queensland Department of Mines.
Dr V M Bofinger	Course Coordinator, Bachelor of Applied Science - Applied Geology, QUT.

Mr G Eades	Supervising Geologist, Queensland Water Resources Commission, Brisbane.
Mr P L Ellis	Director, Department of Industry Development, Brisbane.
Dr R B Gardiner	Dean, Faculty of Science, QUT.
Dr L H Hamilton	Head, Department of Applied Geology, QUT.
Ms R Hegarty	(Graduate), Geologist, Australian Ores and Minerals Ltd, Cairns.
Mr G Lucas	Consultant, Brisbane.
Mr G Moore	Exploration Manager, Consolidated Goldfields, Brisbane.
Mrs J Osborne	(Graduate) Part-time Minerals Employment, Brisbane.
Mr N Rowlands	Exploration Manager, BHP Minerals, Brisbane.
Mr B Saunders	Chief Geologist, Queensland Geological Services, Brisbane.
Mr K Warner	Manager, Geological Services, Queensland Department of Mines.
Dr N Williams	Regional Manager, Technical Services, MIM Holdings Ltd, Brisbane.

#### MATHEMATICS

Dr A Swain (Chairman)	Principal Biometrician, Department of Primary Industries, Brisbane.
Mr G Burrows	Data Processing Controller, QEGB, Brisbane.
Dr J L Byrne	Course Coordinator - Bachelor of Applied Science - Mathematics, QUT.
Mr D Fox	Consultant Actuary, TPF&C, Brisbane.
Dr R B Gardiner	Dean, Faculty of Science, QUT.
Dr R N Gould	Head, Department of Mathematics, QUT.
Professor C C Heyde	Head, Department of Statistics, Australian National University, Canberra.
Assoc Prof C A McGilchrist	Associate Professor of Statistics, University of NSW.
Mr P Robertson	(Graduate) Shannon Robertson Systems, Nambour.

PHYSICS

Mr J P McGilvray (Chairman)	Director, Division of Health & Medical Physics, Department of Health, Brisbane.
Dr J R Bird	Head, Nuclear Physics Section, Australian Nuclear Science & Technology Organisation, Lucas Heights.
Mr R Dunlop	Strand Coordinator - Bachelor of Applied Science, QUT.
Mr R Falls	Regional Director, Bureau of Meteorology, Brisbane.
Dr D W Field	Lecturer in Physics, QUT.
Dr R B Gardiner	Dean, Faculty of Science, QUT.
Mr J B Krauel	(Graduate) Senior Science Master, Redeemer Lutheran College, Brisbane.
Dr B W Thomas	Head, Department of Physics, QUT.
Mr J Whiting	Director, National Safety Council (Qld Division), Brisbane.

## GRADUATE STUDIES STANDING COMMITTEE

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Dr D E Allen (Chairman)	Senior Lecturer, Department of Medical Laboratory Science.
Dr V V Anh	Lecturer, Department of Mathematics.
Mr K J Bowman	Head, Department of Optometry.
Dr M F Capra	Senior Lecturer, Department of Public Health & Nutrition.
Dr M R Chambers	Senior Lecturer, Department of Chemistry.
Dr R L Frost	Senior Lecturer, Department of Chemistry.
Dr K J Gough	Acting Head, School of Computing Science.
Dr B P Lim	Head, School of Architecture & Industrial Design.
Dr J S Welch	Head, Department of Medical Laboratory Science.
Mr J Wilson	Lecturer, Department of Biology.
Dr C F Wong	Lecturer, Department of Physics.
Dr G H Yezdani	Lecturer, Department of Biology.
External Membership:	
Prof G Dromey	Head, School of Computing & Information Technology, Griffith University.
Dr A F Egan	Principal Research Scientist, Micro- biology, CSIRO Division of Food Research.
Dr J Pope	Director, Sir Albert Sakzevski Virus Research Laboratory, Royal Children's Hospital.
Prof Y H Thong	Professor of Child Health, Mater Children's Hospital.
Mr D C Williams	General Manager, Research, MIM Holdings.

## Ex-Officio:

- Dr R B Gardiner      Dean, Faculty of Science.
- Mr T F Heath         Dean, Faculty of the Built Environment.
- Dr D Longley         Dean, Faculty of Information Technology.
- Dr A J Webber         Dean, Faculty of Health Science.



## **Staff — Faculty of Science**



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**STAFF - FACULTY OF SCIENCE**


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\* indicates recipient of Dean's Award in 1988.

Dean:	R B Gardiner, MA, BSc(Hons), PhD(Edin), CPhys, FInstP, FAIP.
Associate Dean:	R G Everson, BSc(Hons)(Syd), PhD(Melb), CBiol, MIBiol, MAIH.
Administration Officer:	J Murphy, BA(Hons)(Qld).
Development Manager:	K D Pulsford, BBus.
Administrative Staff:	M T Nutting, Secretary. V F Kennedy, Administrative Assistant. R L Todd, Administrative Assistant.

DEPARTMENT OF APPLIED GEOLOGY

Head of Department:	L H Hamilton, BE, MSc(NSW), PhD(Lond), DIC, FAIG, MAusIMM.
Senior Lecturer:	V M Bofinger, BSc(Hons)(NE), PhD(ANU).
Lecturers:	*A V Arakel, BSc(Shiraz), PhD(WA). D C O'Connell, BSc DipEd(Qld), MSc(James Cook), BEd(BCAE), FGS(Lond), AMAusIMM. W F Ridley, MSc(Qld). G G Shorten, MSc(Qld), TCert(Kuringgai), AMAus/MM. J P Williams, BSc(Syd), MAppSc, FRAS, MSEG, MASEG, ASEG, AMAusIMM.
Administrative Staff:	B G Johnston, Secretary.
Support Staff:	W Kwiecien, CIC, AssocDipAppChem, Senior Laboratory Technician. B J Feely, MIST, Tech CEI. L Van Duong, BSc(Saigon), Laboratory Assistant. A F Nunn, Laboratory Attendant.

DEPARTMENT OF BIOLOGY

Head of Department:	A Bailey, BSc(Hons)(L'pool), PhD(Adel), CBiol, MIBiol, MAIBiol, MAIH.
Senior Lecturer:	W A Dodd, MSc(Adel), PhD(Alberta).
Acting Senior Lecturer:	J C Wilson, MAppSc, CBiol, MIBiol. (Award for Distinguished Academic Service 1987)
Lecturers:	P V Driscoll, BSc(Hons)(Syd), PhD(Qld), CBiol, MIBiol. D S Kells, BAgSc, DipEd(Melb), MSc (Griffith).

Lecturers (Cont'd): C R King, BSc(Lond), MSc(Salford),  
PhD(Qld), ARCATS, CBiol, MIBiol.  
P B Mather, BBSec(Hons), PhD(La Trobe).  
B J McMahon, MSc(Qld), CBiol, MIBiol.  
\*G H Yezdani, MSc(Sind), PhD (Monash),  
MAIBS, MAIBiol.  
N A White, MAppSc.

Senior Tutor: M Cahill, BSc(Hons).

Administrative Staff: K L Gunthorpe, Secretary.  
A Walker, Acting Clerk.

Support Staff: K D Barton, CMLT, BAppSc, Senior  
Laboratory Technician.  
K Ilievski, BSc(Hons)(Skopje), Senior  
Laboratory Technician.  
E Guindy, Laboratory Technician  
Division I.  
N Sherwin, CBLT, Laboratory Technician  
Division II.  
M Crase, AssocDipAppSc, Laboratory  
Assistant.  
M Hague, AssocDipAppSc, Laboratory  
Assistant.  
J Blundell, Laboratory Attendant.

#### DEPARTMENT OF CHEMISTRY

Head of Department: S F Dyke, PhD(Aberdeen), DSc(Lond),  
CChem, FRSC, FRACI.

Senior Lecturers: \*J P Bartley, MSc(Hons), PhD(Auck),  
CChem(UK), MRSC, AAFST.  
M R Chambers, PhD(Econ)(Stir), PhD(Lond),  
CChem(UK), MRSC, CEng, MinstE.  
R L W Frost, BEd, MSc, PhD(Qld), CChem,  
ARACI.  
G A George, BSc(Hons), PhD, CChem, FRACI.  
P S Hallman, MSc, PhD(Syd), CChem, ARACI.  
P J Hetherington, BSc(App)(Hons), PhD  
(Tas).  
E J O'Reilly, MSc(Qld), DipEd, CChem,  
FRACI.

Lecturers: \*D P Arnold, BSc, PhD(Qld), CChem, ARACI.  
N D Bofinger, BSc(NE), PhD(Qld), CChem,  
ARACI.  
G K Douglas, BSc(Hons)(NE), PhD(Tas),  
CChem, ARACI.  
W J W Hanna, BSc(Hons), PhD(Belf),  
CChem(UK), MRSC.  
K P Herlihy, BSc(Hons)(Qld), DipIndChem,  
CChem, ARACI.  
G M Kimber, MSc, BEd(Qld), CChem, FRACI.  
S Kokot, BSc(Hons), PhD(NSW), CChem,  
ARACI.

- Lecturers (Cont'd): R J Noakes, DipSugarChem, DipIndChem, CChem, ARACI, AAIFST.  
 E T Pallister, MSc, PhD(NSW), CChem, MRSC, ARACI, ASTC.  
 D S Sagatys, BSc(Hons)(Qld), PhD(IIT).  
 D P Schweinsberg, ASTC, BSc(NSW), MSc, PhD(Qld), CChem, ARACI, AMAusIMM.  
 G Smith, BSc, PhD(Qld), DipIndChem, ARACI.  
 B N Venzke, MSc, PhD(Qld).
- Administrative Staff: M Johnston, Secretary.  
 D Freney, Stenographer.  
 N Morrison, Administrative Assistant.
- Support Staff: N A Seils, DipIndChem, Laboratory Manager.  
 J Coombes, CIC, PC(Instrumentation) (Syd), Senior Laboratory Technician Division I.  
 P Comino, CIC, AssocDipAppChem, Senior Laboratory Technician Division I.  
 P Stevens, CIC, AssocDipAppChem, Senior Laboratory Technician Division II.  
 W Skeaf, Laboratory Technician Division I.  
 E Martinez, CIC, AssocDipClinLab Tech, Laboratory Technician Division I.  
 V Beecham, Laboratory Technician Division II.  
 A Grudzinski, AssocDipAppChem, Cadet Technician.  
 K Burgess, Laboratory Assistant.  
 E Mayer, Laboratory Assistant.  
 H Pham, CertChem(Bankstown TAFE), Laboratory Assistant.  
 W Hundertmark, Laboratory Attendant.  
 C Remington, Laboratory Attendant.  
 L Smyth, Laboratory Attendant.  
 M Keyworth, Storeman.

#### DEPARTMENT OF MATHEMATICS

- Head of Department: R N Gould, MSc(Lond), PhD(Hull), FAIM.
- Senior Lecturers: \*V V Anh, BSc(Hons), PhD(Tas), MEc(NE).  
 C M Bothwell, BSc, BEd, MLitSt(Qld), ALCM.  
 J L Byrne, BSc(Qld), MSc(Soton), PhD(Adel).  
 P A Dutton, BSc, DipEd(Syd), MSc(NSW).  
 J Gudgeon, BSc(Hons)(Hull), MSc(Oxon), FIMA.  
 C R Jones, MSc(Liv), FSS.  
 A M B Wolanowski, MSc(Lublin), PhD(Warsaw), DipCompSc(Qld), MSSA, AMACS. (Award for Distinguished Academic Service 1986.)

**Lecturers:** C C Calder, MSc(Lond).  
 E P Dawson, BS, DipEd(Wash), MA(Syd),  
 MLitSt, MSc(Qld).  
 B P Garfoot, BSc(Hons)(N'cle, NSW),  
 PhD(Qld).  
 R F Hubbard, BA(NZ), MLitSt(Qld).  
 M Illic, MSc(Qld).  
 M T Kelly, BSc, DipEd, MLitSt(Qld).  
 M R Littler, DipMath(Tech),  
 BSc(Hons)(Lond), AFIMA, CEng, FIMarE.  
 I F Ogle, MSc(NE), FSS, MSSA.  
 L M Scotney, BSc, DipEd(Qld).  
 B S Tasker, BA(NE).  
 E M Walker, BSc(Hons)(Qld), MSc(Oxon),  
 AIA, AAlA.  
 D F Welburn, BSc(Qld).

**Visiting Lecturers:** Associate Professor Zhao Kepei, Shanghai  
 University, PRC.  
 Mr Xie Lei, Guangxi Agricultural  
 University, PRC.

**Administrative Staff:** J Hollindale, BAdmin(Griff),  
 Administration Officer.  
 M Spanton, Secretary.  
 J Avery, Administrative Assistant.  
 J Clark, Administrative Assistant.

#### DEPARTMENT OF PHYSICS

**Head of Department:** B W Thomas, MSc, PhD, DipEd(WA), FAIP,  
 MACPSM, FAIM.

**Senior Lecturers:** J A Davies, BSc(Hons)(City, London),  
 MSc(Qld), AIMEE.  
 R E Dunlop, MSc(Qld), MAIP, MASUM.  
 B M O'Leary, BSc, DipEd(Syd),  
 MSc(Surrey), MAIP.  
 H C Rose, MSc(Man), CPhys(UK), MInstP,  
 MIM, CEng.  
 \*B J Thomas, BSc(Hons), PhD(WA), MAIP,  
 MACPSM.

**Acting Senior Lecturer:** R J Treffene, BSc(Qld), MSc, PhD(Lond),  
 FASMF.

**Lecturers:** P Best, BSc(Hons)(Bristol), PhD(Monash),  
 MEIA.  
 I R Cowling, BSc(Hons), PhD(Flinders),  
 ISES.  
 I R Edmonds, MSc(Auck), PhD(Warwick),  
 MAIP, ISES.  
 D W Field, BSc(Hons), PhD(Adel), DipT  
 (ACAE).  
 R A Fleming, MSc(Qld), MAIP.

- Lecturers (Cont'd): G H Johnston, AssocDipElecEng, MAppSc.  
P D Killen, BSc(Hons), PhD(Qld).  
T G Lewis, BSc, BEd(Qld), MSc(Aston),  
MSc(Griffith), DipRMS, MAIP.  
W C Middleton, MSc, BEd(Qld), MAIP, MAAS.  
R J Norton, BSc(Qld), MSc(Brunel), MAIP.  
F Quintarelli, BSc(Ed), BSc(Hons),  
PhD(Melb).  
P A Rowntree, DAppSc, MIR.  
D Wilson, MIR.  
C F Wong, DipSc(HongKong), MSc(McGill),  
PhD(Saskatch), MARPS, MAAPT.
- Technologist: N A Raftery, BSc(Hons), BA(Qld).
- Administrative J Dennis, BAppSc, BBus,  
Administration Officer.
- Staff: R Arden, Secretary.  
S Looker, Administrative Assistant.
- Support Staff: R Jeffery, SMIREE, Laboratory Manager.  
R I Kleinschmidt, Technician Division I.  
D J Pitt, Technician Division I.  
J A Jull, Senior Technician Division II.  
G W Kibbey, Senior Technician Division  
II.  
M K Power, Senior Technician Division II.  
B Wheeler, Senior Technician Division II.  
P F Maher, Technician Division II.  
N G Stead, Technician Division II.  
D F Flint, AssocDipElecEng, Laboratory  
Assistant.

## **Courses Offered**

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COURSES OFFERED WITHIN THE FACULTY

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Masters Level

- ASN184 Master of Applied Science by Research and Thesis - available in each Department  
CHN217 Master of Applied Science - Analytical Chemistry  
PHN176 Master of Applied Science - Medical Physics

Graduate Diploma Level

- IFM242 Graduate Diploma in Quality

Degree Level

- ASJ226 Bachelor of Applied Science including Honours year in Microbiology/Biochemistry  
CHJ129 Bachelor of Applied Science - Applied Chemistry  
ESJ132 Bachelor of Applied Science - Applied Geology  
MAJ133 Bachelor of Applied Science - Mathematics

Diploma Level

- PHK205 Diploma in Applied Science - Diagnostic Radiography  
PHK206 Diploma in Applied Science - Therapeutic Radiography

Associate Diploma Level

- ASL225 Associate Diploma in Applied Science

## **General Course Rules**



## GENERAL COURSE RULES

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(a) A registered student may enrol as either a full-time student or a part-time student.

(b) A full-time student normally attends day classes associated with the study program but may, however, elect or be required to attend some evening classes.

A part-time student normally attends evening classes associated with the study program but may, however, elect or be required to attend some day classes.

(c) The method of assessment to be used in the case of each subject will be as approved by the Academic Board and may comprise one or more of -

written and/or oral tests;  
general assignments;  
laboratory exercises and reports;  
projects, field testing, etc.

(d) A student who submits work for assessment after the due date authorised by the Head of Department or School responsible for the subject may be penalised by having the work not accepted for assessment unless, prior to the due date, the student applies in writing to the examiner responsible for the subject for an extension of time in which to submit the work, and is granted such an extension in writing.

(e) Students in a full-time course or a part-time course gain credit for passed units and are required to repeat failed units only.

(f) Students who pass all units in one semester of a particular full-time or part-time program as set out in the relevant course rules will be expected to enrol in the units set out for the following semester of the relevant program in those Rules. Timetables are organised on the basis of this normal progression.

(g) (i) A pre-requisite unit is one which must be passed before proceeding to a further unit which has the pre-requisite so specified.

(ii) A co-requisite unit is one which, if not previously passed, must be studied concurrently with another unit with which it is a co-requisite.

(iii) Where a pre-requisite or co-requisite unit is designated as a repeat-requisite (indicated by the post-script [R]), the pre-requisite or co-requisite requirement may be satisfied by the student having attempted the unit but a passing grade is not essential. A student is deemed to have attempted the unit if all assessment requirements have been attempted when registered for the unit.

- (iv) Where subjects are designated as being incompatible, credit may be retained for one subject or the other, but not for both.

Pre-requisites, co-requisites, repeat-requisites and incompatible subjects are shown in Section 17.

- (h) Students who fail units shall be allowed to proceed with the study of some or all of the units from the next semester of the program provided that -
- (i) they have satisfied the pre- and co-requisite requirements as defined in Rule (g) and as set out in Section 17; and
  - (ii) the hours associated with the selected program fall between the maximum and minimum hours defined in Rules (j), (k) and (l); and
  - (iii) the established timetable permits the selected units to be studied concurrently. When timetable clashes make it necessary, full-time students may be permitted or required to attend evening classes, and part-time students may be permitted or required to attend day classes;

except that, in certain circumstances, students who fail a unit which is a pre-requisite for a second unit may nevertheless be deemed eligible to enrol in the second unit, such eligibility being determined by the Head of the Department or School administering the second unit.

- (i) For a candidate to qualify for graduation, he or she should, except in special circumstances and at the discretion of the Dean, (i) obtain a grade of at least 3 in all subjects specified for the award, and (ii) obtain a Graduation Index of at least 3.9 (where the Graduation Index is calculated as for the Weighted Grade Average but counting only the best result for a repeated subject and ignoring all subjects for which the best result is 2 or 1).
- (j) Except with the approval of the Head of Department or School, the total number of hours associated with the units selected for study by full-time students should not exceed the number of hours allocated to the semester of the normal program in the relevant course rules and from which the majority of units have been selected.
- (k) Except with the approval of the Head of Department or School, the maximum number of hours allowable for study by part-time students is as specified in any one year of the relevant course rules.
- (l) Except with the approval of the Head of Department or School, the total hours associated with the units selected for study shall be the number of hours allocated to the semester of the program from which the majority of the units have been selected.

- (m) No formal supplementary examinations will be offered following the semester examinations. However, if an examiner considers such action justified, a student may be recalled for further assessment. On the basis of this additional testing a pass may be granted.

Students who are required to present themselves for further assessment should contact the relevant Department or School to ascertain the nature of the further assessment. In all cases the requirements for further assessment must be completed by a date not later than the end of the first week of the following semester.

- (n) Exemptions. Rules concerning the granting of exemptions are detailed under 'Rules Relating to Student Matters'. (See Section 3.)
- (o) Some essential teaching activities conducted off-campus involve field trips. The Academic Board is required to approve essential field trips for each semester and students are expected to attend all such field trips. Except with the approval of the Head of Department or School, failure to attend these field trips will adversely affect assessment in the relevant subjects.

## General Structures





Master of Applied Science Courses

## ASN184 MASTER OF APPLIED SCIENCE BY RESEARCH AND THESIS

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The program is administered by a Graduate Studies Standing Committee, hereafter referred to as the "Committee".

Unless the context otherwise indicates or requires, the words 'academic board' and 'faculty' shall refer to the faculty in which the student registers.

### OBJECTIVES:

- (a) to provide postgraduate educational opportunities in specialised fields of applied science by means of a program which involves either an original contribution to knowledge or an original application of existing knowledge.
- (b) to provide further education in research methods.
- (c) to enable graduates employed in industry to undertake further education by research and thesis.
- (d) to enable industrial organisations and other external agencies to sponsor a student research program under the control and supervision of the faculty.
- (e) to further the relationships between the University and industry or other external agencies engaged in applied science, to their mutual advantage.

### OUTLINE OF PROGRAM:

- (a) Candidates undertaking a Master of Applied Science by Research and Thesis will undertake a project on a topic approved by the Committee.
- (b) All projects should be sponsored either by outside agencies such as industry, Government authorities, or professional organisations, or by the University.
- (c) The project, including submission of the thesis, should require approximately two years of full-time work or its equivalent.
- (d) The program should give the candidate the opportunity to develop and demonstrate a level of scientific competency which is significantly higher than that expected of a first degree graduate. The required competency would normally include mastery of relevant techniques, investigatory skills, critical thinking, and a high level of knowledge in the specialist area.

RULES:

1. Application

- 1.1 Applications shall be accepted subject to the availability of facilities and supervision.
- 1.2 Applications may be lodged with the Registrar at any time.
- 1.3 The academic qualifications for admission to the program leading to Master of Applied Science by Research and Thesis, shall be -
  - (a) possession of a bachelor's degree in applied science from the Queensland University of Technology, or
  - (b) possession of an equivalent qualification, or
  - (c) submission of any other evidence of qualifications as will satisfy the Committee that the applicant possesses the capacity to pursue the course of study.
- 1.4 Additional requirements for admission to a particular program may be laid down by the Committee.
- 1.5 An applicant shall seek admission as -
  - (a) a full-time student who will carry out research on a full-time basis in a school/department of the faculty or in the place of employment or in a sponsoring institution, or
  - (b) a part-time student who will normally be employed in some other capacity during the day and carry out research on a part-time basis in a school/department of the faculty or in the place of employment or a sponsoring institution.
- 1.6 Students may be internal or external.

An external student is one whose program of work is based at his/her place of employment or sponsoring institution. In the case of an external student the Committee shall appoint an associate supervisor from the student's place of employment or sponsoring institution.

## 2. Registration

2.1 An applicant shall be registered initially as

- (a) a graduate student (provisional), or
- (b) a graduate student.

A graduate student (provisional) becomes a graduate student when registration is confirmed (2.5).

2.2 At the time of consideration of an application, the Committee shall have before it

- (a) full details of the applicant's tertiary qualifications or other submissions, as in 1.3, and
- (b) a synopsis of the research proposed by the applicant.

2.3 The Committee shall not admit an applicant unless it has received

- (a) in the case of the student whose program will be carried out in the University:

a statement from the head of school/department in which the study is proposed that, in his/her opinion, the applicant is a fit person to undertake a research program leading to the Master's degree, that the program is supported, and that the school/department is willing to undertake the responsibility of supervising the applicant's work.

- (b) in the case of a student whose program will be carried out in the place of employment or in a sponsoring institution:

a statement from the employer or director of the sponsoring institution that the applicant will be provided with facilities to undertake the research project and that he/she is willing to accept responsibility for supervising the applicant's work, and

a statement from the head of school/department in which the study is proposed that, in his/her opinion, the applicant is a fit person to undertake a research program leading to the Master's degree, that the program is supported, and that after examination of the proposed external facilities and supervision, the school/department is willing to accept the responsibility of supervising the work.

- 2.4 In considering an applicant for registration the Committee shall, in addition to assessing the applicant's suitability, assess the proposed program and its relevance to the aims and objectives of the University.
- 2.5 An applicant shall receive confirmed registration as a graduate student when he/she
- (a) has satisfied the requirements for admission and has achieved by work and study a standard recognised by the Committee, or  
  
has been accepted for provisional registration in the faculty and has achieved, by subsequent work and study, a standard recognised by the Committee,
  - (b) has satisfied the Committee that he/she is a fit person to undertake the program,
  - (c) has satisfied the Committee that he/she can devote sufficient time to the research and study.
- 2.6 A student whose registration in the program has been cancelled and who subsequently wishes to re-enter the program to undertake a research project which is the same or essentially the same as the previous project may be re-admitted to the program under such conditions as the Committee may prescribe.
3. Duration of the Program
- 3.1 A graduate student shall be eligible for admission to the award of a Master's Degree by Research and Thesis if he/she
- (a) has completed the approved program under the supervision prescribed by the Committee, and
  - (b) has submitted and the Committee has accepted a thesis prepared under the supervision of the supervisor, and
  - (c) has completed any other work prescribed by the Committee.

### 3.2 Minimum Time

- (a) A graduate student (provisional) shall not be eligible for confirmation of registration as a graduate student:

in the case of a full-time student until a period of at least six months has elapsed from initial registration, or

in the case of a part-time student until a period of at least one year has elapsed from initial registration.

- (b) A graduate student shall not normally be eligible for the award of the degree:

in the case of a full-time student until a period of at least two years has elapsed from the time of initial registration, or

in the case of a part-time student until a period of at least four years has elapsed from the time of initial registration.

- (c) A student able to demonstrate exceptional circumstances relating to his/her academic or professional background may apply to the Committee for a reduction in the minimum time requirement. No student shall be eligible for the award of the degree until a period of at least one year has elapsed from the time of initial registration.

### 3.3 Maximum Time

A graduate student shall present the thesis for examination

- (a) in the case of a full-time student, not later than two years from the date of confirmed registration, or

- (b) in the case of a part-time student, not later than four years from the date of confirmed registration

unless special permission for an extension of time has been granted by the Committee.

## 4. Supervision

- 4.1 For each student the Committee shall appoint one or more supervisors with appropriate experience provided that, where more than one supervisor is appointed, one shall be nominated as the principal supervisor and others as associate supervisors.

- 4.2 In the case of an internal student, the principal supervisor normally shall be from the academic staff of the school/department where the student carries out the work.
- 4.3 In the case of an external student, the principal supervisor normally shall be from the academic staff of the school/department supporting the work and at least one associate supervisor shall be from the sponsoring organisation.
- 4.4 At the end of each six month period
- (a) a student shall submit a report on the work undertaken to the principal supervisor, and
  - (b) the principal supervisor shall submit a report to the Committee on the student's work and this report shall be seen by the student before submission to the Committee.
- 4.5 A student may be required by the Committee to undertake an appropriate course of study concurrently with the research project.
- 4.6 A student shall be required to participate in and present seminars as considered appropriate by the principal supervisor. The student shall be notified of minimum attendance requirements at the time of acceptance of enrolment.

## 5. Thesis

- 5.1 Not later than six months after confirmed registration the student shall submit the title of the thesis for approval by the Committee. After approval has been granted, no change shall be made except with the permission of the Committee.
- 5.2 The student shall give two months' notice of intention to submit the thesis. Such notice shall be accompanied by the appropriate fee, if any.
- 5.3 The thesis shall comply with the following requirements:
- (a) a significant portion of the work described must have been carried out subsequent to initial registration for the Master's degree;
  - (b) it must describe a program of work carried out by the candidate, and must involve either an original contribution to knowledge or an original application of existing knowledge;

- (c) it must be written in English or in a language approved by the Committee and must reach a satisfactory standard of literary presentation;
- (d) it shall be the candidate's own account of the work. Where work is carried out conjointly with other persons, the Committee shall be advised of the extent of the candidate's contribution to the joint work;
- (e) the thesis shall not contain as its main content any work or material which the student has previously submitted for another degree or similar award;
- (f) supporting documents, such as published papers, may be submitted with the thesis if they have a bearing on the subject of the thesis; and
- (g) the thesis shall contain an abstract of not more than 300 words.

5.4 In form of presentation, availability and copyright, the thesis shall comply with the provisions of the document Requirements for Presenting Theses as approved by Academic Assembly.

#### 5.5 Examination of Thesis

- (a) The Committee shall appoint at least two examiners of whom at least one shall be from outside the University.
- (b) The candidate may be required to make an oral defence of the thesis.
- (c) On receipt of satisfactory reports from the examiners, the Committee shall recommend to the academic board that the degree be awarded.

When the provisions of 5.4 have been fulfilled, the academic board shall recommend to Council that the student be awarded the degree.

- (d) If, on the basis of the examiners' reports, the Committee does not recommend that the degree be awarded then the Committee shall permit the student to resubmit the thesis within one year for re-examination, or cancel the student's registration.

CHN217 MASTER OF APPLIED SCIENCE -  
ANALYTICAL CHEMISTRY

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Intake into the course occurs only in odd numbered years.

1. To be eligible to enrol for the Master of Applied Science - Analytical Chemistry, an applicant shall have completed a tertiary course at professional level, with chemistry or biochemistry as a major field of study, (or possess equivalent qualification), at a level of achievement considered satisfactory by the Head of Department for entry to the Masters program. Applicants should normally have had some relevant professional experience.

Applicants who do not meet the requirements for normal entry may seek special consideration. Such applications will be considered by the Head of Department of Chemistry.

Where an equivalent course of study or examination cannot be readily established, an applicant, at the discretion of the Dean, may be permitted to undertake a qualifying examination, satisfactory completion of which will entitle the applicant to the status of Graduate for the purpose of admission.

2. A research/development project is to be undertaken as part of the unit CHN510 Analytical Chemistry V. The project report is required to be submitted for assessment by a date set down by the Head of Department.

A student may request an extension of time in which to submit the project report for assessment. A request for an extension of time up to a maximum of six months shall be made in writing through the Head of Department to the Dean. Any request for a further extension, or any request for an extension to a date later than six months after the original due date, shall be made in writing to the Academic Board. The Academic Board may grant the extension under such conditions as it may consider appropriate, or may award the student a 'Fail' result in the project subject.

3. A student who has received a 'Fail' result in the project subject may re-enrol in the subject only in exceptional circumstances and with the express permission of the Academic Board.
4. The project report shall comply with the following requirements:
  - (a) a significant proportion of the work described must have been completed subsequent to initial registration for the Master's degree;
  - (b) it must represent either an original contribution to the knowledge of the subject or an original application of existing knowledge;

- (c) it must be written in English or in a language approved by the Academic Board, and must reach a satisfactory standard of literary presentation;
- (d) it shall be the candidate's own account of the work. Where work is carried out conjointly with other persons, the Academic Board will be advised as to the extent of the candidate's contribution to the joint work;
- (e) the report shall not contain as its main content any work or material which the student has previously submitted for another degree or similar award;
- (f) supporting documents, such as published papers, may be submitted with the report if they have a bearing on the subject of the report;
- (g) the report shall contain an abstract of not more than 300 words.
5. No formal supplementary examinations will be offered following examinations. However, if an examiner considers such action justified, a student may be recalled for further informal assessment before the release of the examination results. This may take the form of oral questioning or a short written test, and may cover only the areas of the topic previously shown to be below standard. On the basis of this additional testing, a pass may be granted.

6. NORMAL COURSE PROGRAM -

	EFTSU Credit	Approx Formal Hrs/wk
Eight Semesters Part-Time		
<u>Semester 1</u>		
MAN255 Statistics	6	2
CHN110 Analytical Chemistry I	18	6
<u>Semester 2</u>		
PHN150 Optics	6	2
CHN210 Analytical Chemistry II	18	6
<u>Semester 3</u>		
PHN350 Electronics	6	2
CHN345 Laboratory Management	3	1
CHN310 Analytical Chemistry III	15	5
<u>Semester 4</u>		
CHN410 Analytical Chemistry IV	15	5
CHN445 Laboratory Automation	9	3
<u>Semesters 5 - 8</u>		
CHN510 Analytical Chemistry V	24	8

PHN176 MASTER OF APPLIED SCIENCE -  
MEDICAL PHYSICS

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1. To be eligible to enrol for the Master of Applied Science - Medical Physics, an applicant must have completed an acceptable tertiary course with a major in Physics.  
Applicants with other qualifications (eg engineering) may be enrolled subject to the approval of the Head of Department. In some instances, a bridging program may be necessary.
2. A registered student may enrol as either a full-time or a part-time student.  
A part-time student will be required to attend some day classes, and a full-time student may be required to attend some evening classes.
3. The part-time program will be offered only in those years in which sufficient enrolments are received.
4. The program consists of two parts, Stage I and Stage II. Progression to Stage II will be dependent on satisfactory completion of Stage I or special permission of the Head of Department. Formal contact hours for a student enrolled in the full-time course average approximately 20 hours per week during semester, and the topics covered within the course are listed in Rule 9.
5. The method of assessment to be used in the case of each subject will be approved by the Academic Board and may comprise one or more of written and/or oral tests; general assignments; laboratory exercises and reports.  
Students will be required to submit a project report for assessment by a date set down by the Head of Department. This report will be assessed by a panel of examiners including a nominated external examiner. In addition the student will be required to discuss the completed project with the same panel of examiners.  
A student may request an extension of time in which to submit the project report for assessment. A request for an extension of time up to a maximum of six months shall be made in writing through the Head of Department to the Dean. Any request for a further extension, or any request for an extension to a date later than six months after the original due date, shall be made in writing to the Academic Board. The Academic Board may grant the extension under such conditions as it may consider appropriate, or may award the student a 'Fail' result in the project subject.

6. A student who has received a 'Fail' result in the project subject may re-enrol in the subject only in exceptional circumstances and with the express permission of the Academic Board.
7. Registered students in the course will be expected to enrol for the full semester program as in Rule 9.
8. No formal supplementary examinations will be offered following examinations. However, if an examiner considers such action justified, a student may be recalled for further informal assessment before the release of the examination results. This may take the form of oral questioning or a short written test, and may cover only the areas of the topic previously shown to be below standard. On the basis of this additional testing, a pass may be granted.
9. NORMAL COURSE PROGRAM -

Four semesters full-time

Eight semesters part-time

EFTSU Approx F/T P/T  
Credit Formal Sem Sem  
Hrs/wk

STAGE I

SECTION I

				1	1
PHN101	Analog Electronics	4	2		
PNN161	Anatomy & Physiology I	6	3		
PHN102	Introduction to Medical Computing	2	1		
PHN116	Professional Experience Tour	2	1		
PHN103	Radiation Physics	8	4		

SECTION II

				1	3
PHN201	Administration & Budgeting	2	1		
MSN111	Biochemistry	4	2		
PHN202	Biomechanics	6	3		
PHN203	Radiobiology & Genetics	4	2		
PHN204	Safety & Occupational Health	2	1		
PHN205	Radiation Health Physics	4	2		

SECTION III

				2	2
PNN165	Anatomy & Physiology II	6	3		
PHN301	Digital Electronics	6	3		
PHN302	Instrumentation	4	2		
PHN303	Medical Signal & Data Analysis	4	2		
PHN316	Professional Experience Attachment	2	1		
PHN304	Medical Imaging Science	4	2		

SECTION IV			2	4
PHN416	Professional Experience Attachment	2	1	
PHN401	Nuclear Medicine	4	2	
PHN402	Radiotherapy	4	2	
PHN403	Diagnostic Radiology	2	1	
PHN404	Ultrasound & Non-Ionising Radiation	4	2	
PHN405	Physiological Measurement	4	2	

EFTSU Approx F/T P/T  
Credit Formal Sem Sem  
Hrs/wk

STAGE II

PHN520	MEDICAL PHYSICS V (F/T) or	44	18	3,4
PHN540	MEDICAL PHYSICS V (P/T) 5,6,7,8	22	9	

Comprising -  
Professional Practice, Case  
Studies & Project



Graduate Diploma Course

## IFM242 GRADUATE DIPLOMA IN QUALITY

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The course is administered by the Academic Boards of the Faculties of Business, Engineering and Science via a three person Executive Committee, one member of which shall be referred to as Course Coordinator.

### 1. ENTRY REQUIREMENTS

To be eligible for enrolment in the Graduate Diploma in Quality, an applicant shall have completed a course at degree level or possess an equivalent qualification in Science, Engineering, Management, Commerce, Education or another field deemed to be appropriate.

Where an equivalent course of study or examination cannot be readily established, an applicant may, in accordance with University practice, be recommended for special entry. This type of entry may depend collectively on such factors as the applicant's qualifications, background experience, current employment position etc.

### 2. COURSE RULES

- (a) The program is offered as a part-time internal course of study.
- (b) Registered students enrolled in the program are classified as part-time students. Such students normally attend evening classes associated with the course.
- (c) The method of assessment to be used in the case of each coursework unit may comprise one or more of:
  - written and/or oral tests;
  - practical work;
  - general assignments;
  - laboratory exercises;
  - reports;
  - final examination.

Successful completion of the project unit will involve preparation of a report involving documentation to accepted industry standards and will include an explanation of the problem under investigation, a description of the techniques used together with an evaluation of the results obtained.

- (d) A student who submits work for assessment after the appropriately authorised due date may be penalised by having the work not accepted for assessment unless, prior to the due date, the student applies in writing to the examiner responsible for the unit for an extension of time in which to submit the work, and is granted such an extension in writing.

- (e) Registered students in the course are expected to enrol for the full semester program as shown in Rule 3 below.
- (f) No formal supplementary examinations will be offered following examinations. However, if an examiner considers such action justified, a student may be recalled for further informal assessment before the release of the examination results. This may take the form of oral questioning or a short written test, and may cover only the areas of the topic previously shown to be below standard. On the basis of this additional testing, a pass may be granted.

### 3. NORMAL COURSE PROGRAM

		EFTSU	Approx Formal	Duration
		Credit	Hrs/Wk	(Wks)
<u>Semester 1 - Autumn</u>				
MEP173	Quality Control Planning	6	3	1-7
MNP112	Quality System Management	6	3	1-7
MAP111	Statistical Methods in Quality	6	3	8-14
MNP113	Managing Communications for Quality	6	3	8-14
<u>Semester 2 - Spring</u>				
MEP273	Quality Measurement & Testing	6	3	1-7
MAP121	Statistical Process Control	6	3	1-7
ACP213	Quality Cost Analysis	6	3	8-14
MNP123	Human Factors in Quality	6	3	8-14
<u>Semester 3 - Autumn</u>				
MAP211	Sampling Procedures	6	3	1-7
MNP218	Economic Analysis	6	3	1-7
MEP371	Reliability & Maintainability	6	3	8-14
ISP380	Quality Informations Systems	6	3	8-14
<u>Semester 4 - Spring</u>				
MEP473	Quality Systems & Assessment	8	2	1-14
MAP221	Quality Problem Solving Techniques	8	2	1-14
IFP222	PROJECT	8	2	1-14



Bachelor of Applied Science Courses  
Including Honours Program

ASJ226 BACHELOR OF APPLIED SCIENCE  
WITH MAJOR STRANDS IN:  
BIOLOGY, CHEMISTRY, MICROBIOLOGY/BIOCHEMISTRY,  
GEOLOGY, MATHEMATICS, PHYSICS

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1. Entrance Requirements - refer to QUT Admission Procedures booklet.
2. General Course Rules - see relevant section.
3. A student may register as either a full-time or a part-time student.
4. To fulfil the requirements for the award of the degree, a student must complete subjects totalling at least 126 course hours\*, including major, sub-major and supporting studies. Major and sub-major studies are defined in Rule 7.
5. Students are required to attend scheduled academic advising sessions to plan their progression through the course, and to obtain the approval of an academic adviser prior to affecting any change of enrolment.
6. Students are normally expected to complete the course in minimum time. A full-time student will enrol in an average of 21 course hours per semester for six semesters, and a part-time student will complete the same number of course hours over twelve semesters.

A typical program of study# will consist of not less than 126 course hours and will include:

- (a) major studies: 54 - 60 course hours as specified in Rule 7;
- (b) sub-major studies: at least 27 course hours as specified in Rule 7; and
- (c) supporting studies: subjects not limited by course rules (see Note (iii) on the Rules for details). Specified supporting subjects are required in some areas, especially at first level (see Table 1).

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\* See note (i) on these rules.

# See note (iv) on these rules.

7. Major and sub-major studies are defined in terms of the discipline and the academic level at which subjects are offered:

- (a) A major must be completed in one of the following discipline areas - biology, chemistry, microbiology/biochemistry, geology, mathematics, physics. Completion of a major consists of passing subjects totalling 54 - 60 course hours, of which 12 course hours shall be at first level. At least 21 course hours must be completed at third level.

The total semester hours specified for each major are set out in Table 1 below, together with prescribed supporting studies.

- (b) A sub-major may be completed in any approved area within the University. Completion of a sub-major consists of passing subjects totalling at least 27 course hours, of which 6 course hours shall be at first level. Except in special circumstances and with the permission of the Dean, at least six hours must be completed at third level.

Major and sub-major studies may be undertaken in the same or in closely related discipline areas.

8. Cooperative Education Option - One year's paid industrial experience.

A registered student who has completed the equivalent of the first and second years of the standard full-time course, normally with a WCA of not less than 4.5 overall, may, at the discretion of the Cooperative Education Program Coordinator, undertake the Cooperative Education option.

This involves 10-12 months of paid full-time employment in an approved industrial/commercial environment during which time the student will be enrolled in the units Industrial Experience I (First Semester) and Industrial Experience II (Second Semester). On completion of the approved industrial experience the student resumes formal studies.

9. Honours Program (subject to final approval)

From 1989 a fourth year Honours program will be available following completion of the Microbiology/Biochemistry strand. Students in other strands of the course should note that it is hoped to introduce an Honours year following completion of other strands progressively over the next few years.

## (a) Entry Requirements:

To be eligible to enrol in the Honours year, an applicant must hold a recognised bachelor's degree, with major study in microbiology, biochemistry or biotechnology. The applicant's overall level of achievement at undergraduate level is normally expected to be no less than 5.0 on a 7 point grading scale over all third-level subjects related to the area of study in the Honours year. The third-level subjects deemed relevant to the Honours year will be determined by the Head of Department and the Dean.

Applicants for entry to the Honours program will, normally, be new graduates or those who completed their bachelor's degree no more than two years prior to commencement of the Honours year.

## (b) Course Structure:

Semester 1 (Autumn)		EFTSU Credit Hrs/wk	
MSP120	Advanced Genetic Engineering	12	6
MSP121	Research Strategies I	6	3
MSP123	Readings in Biotechnology I	6	3
MSP125-1	Project	18	9
Semester 2 (Spring)			
CHP150	Biochemical Engineering	12	6
MSP122	Research Strategies II	6	3
MSP124	Readings in Biotechnology II	6	3
MSP125-2	Project	18	9

SUBJECT SCHEDULES

Pre- and co-requisite subjects and incompatible subjects are shown in Section 17.

(A) = offered in Autumn semester

(S) = offered in Spring semester

(AS) = offered in both semesters.

FIRST SCHEDULE - FIRST LEVEL SUBJECTS

<u>Biology Subjects</u>		EFTSU Credit Hrs/Wk	
BEB103	Biology IA (A)	6	3
BEB104	Biology IB (A)	6	3
BEB201	Cell Biology (S)	6	3
BEB207	Biological Systems (S)	6	3

		EFTSU	
<u>Chemistry Subjects</u>		Credit	Hrs/Wk
CHB101	Chemistry IA (A)	6	3
CHB102	Chemistry IB (AS)	6	3
CHB201	Chemistry IIA (S)	6	3
CHB202	Chemistry IIB (S)	6	3
<u>Geology Subjects</u>			
ESB101	Earth Science IA (A)	6	3
ESB102	Earth Science IB (A)	6	3
ESB201	Earth Science IIA (S)	6	3
ESB202	Earth Science IIB (S)	6	3
<u>Mathematics Subjects</u>			
MAB201	Mathematics IA (A)	6	3
MAB202	Mathematics IB (A)	6	3
MAB203	Mathematics IC (A)	6	3
MAB204	Mathematics IIA (S)	6	3
MAB205	Mathematics IIB (S)	6	3
MAB206	Mathematics IIC (S)	6	3
MAB208	Statistics I (S)	6	3
<u>Microbiology/Biochemistry Subject</u>			
MSB101	Microbiology I (S)	6	3
<u>Physics Subjects</u>			
PHB110	Physics IA (A)	6	3
PHB111	Physics IB (A)	6	3
PHB210	Physics IIA (S)	6	3
PHB211	Physics IIB (S)	6	3
<u>Other Subjects</u>			
ASB101*	Study Support Skills (A)	2	1
ASB200	Introductory Meteorology (S)	6	3
BEB149	Introductory Biology (A)	6	3
CHB001	Introductory Chemistry (A)	6	3
CMB104	Professional Communication (AS)	12	3
CSB155	Introduction to Computing (AS)	6	3
CSB283	Scientific Applications (S)	6	3
MNB101	Applied Psychology (AS)	12	3
PHB104	Introductory Physics (A)	6	3

Such other subjects as may be approved by the Faculty of Science Academic Board from time to time.

\* This subject must be undertaken by all students unless exemption has been granted.

SECOND SCHEDULE - SECOND LEVEL SUBJECTS

		EFTSU	
		Credit	Hrs/wk
BEB303	Biology II (S)	12	6
BEB321	Plant Physiology (A)	8	4
BEB357	Populations & Systems Ecology (A)	6	3
BEB358	Experimental Design (A)	6	3
BEB366	Biology & Soils (A)	6	3
BEB388	Aquaculture (A)	6	3
BEB390	Field Studies I (S)	6	3
BEB403	Biology III (S)	8	4
BEB411	Animal Physiology (S)	8	4
BEB423	Plant Tissue Culture (S)	6	3
BEB429	Vegetation Studies (S)	6	3
BEB435	Introductory Genetics (A)	6	3
BEB444	Population Analysis (S)	6	3
CHB310	Analytical Chemistry III (AS)	8	4
CHB327	Chemical Technology III (A)	6	3
CHB340	Spectroscopy (AS)	6	3
CHB351	Organic Chemistry IIIC (A)	10	5
CHB371	Physical Chemistry IIIC (A)	8	4
CHB411	Environmental Analytical Chemistry (S)	8	4
CHB427	Chemical Technology IV (S)	8	4
CHB430	Inorganic Chemistry IV (S)	6	3
CHB440	Separation Methods (S)	6	3
CHB451	Organic Chemistry IVC (S)	6	3
CHB471	Physical Chemistry IVC (S)	6	3
ESB313	Mineralogy (A)	8	4
ESB320	Mineral Assemblages (A)	6	3
ESB321	Soil Science (A)	8	4
ESB353	Structural Geology III (A)	4	2
ESB363	Economic Geography III (A)	8	4
ESB383	Field Excursions III (A)	2	1
ESB393	Field Techniques (A)	6	3
ESB403	Geochemistry (S)	6	3
ESB413	Petrology IV (S)	8	4
ESB433	Geophysics (S)	4	2
ESB443	Introduction to Groundwater & Petroleum (S)	6	3
ESB453	Applied Geomorphology (S)	6	3
ESB473	Law for Geologists (S)	4	2
ESB483	Field Excursions IV (S)	2	1
ESB493	Stratigraphy & Sedimentation (S)	10	5
ESB530	Ore Deposits (A)	6	3
MAB401	Mathematics IIIA (A)	6	3
MAB402	Mathematics IIIB (A)	6	3
MAB403	Mathematics IIIC (A)	6	3
MAB404	Statistics II (A)	6	3
MAB405	Mathematics IVA (S)	6	3
MAB406	Mathematics IVB (S)	6	3
MAB407	Mathematics IVC (S)	6	3
MAB408	Mathematics IVD (S)	6	3

		EFTSU	
		Credit	Hrs/Wk
MSB310	Biochemical Methodology III (A)	8	4
MSB410	Biochemical Methodology IV (S)	8	4
MSB412	Immunology IV (S)	8	4
MSB415	Biochemistry III (AS)	10	5
MSB416	Biochemistry IV (AS)	10	5
MSB450	Microbiology III (A)	6	3
MSB454	Microbiology IV (AS)	8	4
PHB308	Electronics I (A)	6	3
PHB310	Wave Theory & A.C. Circuits (A)	6	3
PHB311	Optics & Acoustics (A)	6	3
PHB316	Experimental Physics III (A)	6	3
PHB401	Thermal & Vacuum Physics (S)	6	3
PHB402	Relativity & Radiation Physics (S)	6	3
PHB405	Instrumentation (S)	6	3
PHB408	Electronics II (S)	6	3
PHB410	Physical Properties of Materials (A)	6	3
PHB416	Experimental Physics IV (S)	12	6
PHB611	Astronomy (S)	6	3
PNB305	Human Nutrition I (A)	6	3
PNB405	Human Nutrition II (S)	6	3
PNB231*	Anatomy & Physiology I (AS)	8	4
PNB232*	Anatomy & Physiology II (AS)	8	4

Such other subjects as may be approved by the Faculty of Science Academic Board from time to time.

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\* Students wishing to undertake studies in Nutrition will be required to pursue alternatives physiology units.

THIRD SCHEDULE - THIRD LEVEL SUBJECTS

		EFTSU	
		Credit	Hrs/Wk
BEB447	Environmental Monitoring (A)	6	3
BEB490	Field Studies II (A)	6	3
BEB500	Selected Topics I (A)	6	3
BEB535	Population Genetics (A)	6	3
BEB560	Projects I (A)	12	6
BEB563	Biological Resources (S)	6	3
BEB600	Selected Topics II (S)	6	3
BEB653	Population Management (S)	8	4
BEB655	Case Studies in Population Management (S)	10	5
BEB660	Projects II (S)	12	6
BEB663	Bioculture (A)	10	5
CHB510	Instrumental Analysis (A)	8	4
CHB527	Chemical Technology V (A)	8	4
CHB530	Inorganic Chemistry V (A)	6	3
CHB551	Organic Chemistry VC (A)	6	3
CHB571	Physical Chemistry VC (A)	6	3
CHB590	Materials Science (A)	6	3
CHB600	Project (S)	20	10
CHB610	Advanced Analysis (S)	4	2
CHB627	Chemical Technology VI (S)	4	2
CHB628	Energy Technology (S)	6	3
CHB631	Advanced Inorganic Chemistry (S)	6	3
CHB641	Advanced Spectroscopy (S)	6	3
CHB651	Biological Chemistry (S)	6	3
CHB660	Industrial Visits (S)	2	1
CHB671	Solids & Surfaces (S)	6	3
CHB690	Advanced Materials Science (S)	6	3
CHB691	Environmental Chemistry (S)	6	3
ESB513	Economic Geology V (A)	8	4
ESB520	Applied Geochemistry (A)	6	3
ESB523	Hydrogeology (S)	6	3
ESB533	Exploration Geochemistry (A)	8	4
ESB543	Petrology V (A)	6	3
ESB573	Field Excursions V (A)	4	2
ESB593	Sedimentary Petrology (A)	6	3
ESB603	Petroleum & Coal Geology (S)	10	5
ESB613	Mineragraphy & Mining Geology (S)	6	3
ESB633	Exploration Geophysics (A)	6	3
ESB643	Structural Geology VI (S)	6	3
ESB653	Engineering Geology (S)	6	3
ESB673	Field Excursion VI (S)	4	2
ESB693	Mining Property Evaluation (S)	4	2
MAB701	Mathematics VA (A)	6	3
MAB702	Mathematics VB (A)	6	3
MAB703	Mathematics VC (A)	6	3
MAB704	Mathematics VD (A)	6	3
MAB705	Mathematics VIA (S)	6	3
MAB706	Mathematics VIB (S)	6	3
MAB707	Mathematics VIC (S)	6	3
MAB708	Mathematics VID (S)	6	3

		EFTSU	
		Credit	Hrs/Wk
MSB510	Food Microbiology (A)	6	3
MSB511	Microbial Physiology & Metabolism V (A)	8	4
MSB512	Virology (A)	6	3
MSB520	Biochemistry V (A)	10	5
MSB521	Biochemical Separations (A)	8	4
MSB525	Project (Y)	6	3
MSB530	Introductory Molecular Biology (A)	10	5
MSB610	Microbial Technology (S)	10	5
MSB611	Applied Microbiology (S)	8	4
MSB620	Biochemistry VI (S)	10	5
MSB621	Analytical Biochemistry (S)	8	4
MSB630	Genetic Engineering (S)	10	5
MSB712	Immunology V (A)	8	4
MSB718	Clinical Biochemistry V (A)	8	4
MSB719	Clinical Biochemistry VI (S)	8	4
MSB755	Microbiology V (A)	14	7
MSB756	Clinical Bacteriology VI (S)	14	7
PHB501	Applied Quantum Mechanics (A)	6	3
PHB502	Electromagnetic Field Theory (A)	6	3
PHB508	Electronics III (A)	6	3
PHB510	Physical Methods of Analysis I (A)	6	3
PHB511	Physical Methods of Analysis II (A)	6	3
PHB516	Experimental Physics V (A)	12	6
PHB601	Solid State Physics (S)	6	3
PHB602	Nuclear Physics & Energy (S)	6	3
PHB608	Applied Acoustics (S)	6	3
PHB609	Applied Radiation Physics (S)	6	3
PHB613	Biophysics (S)	6	3
PHB615	Science Education (S)	6	3
PHB616	Project (AS)	18	9
PHB617	Science & Society (AS)	6	3
PHB620	Topics in Physics (S)	6	3

Such other subjects as may be approved by the Faculty of Science Academic Board from time to time.

A registered student who has completed the first and second years of the standard full-time course may undertake a cooperative education option at the discretion of the Course Coordinator. During this period, the student should enrol in the following units:

ASB300	Industrial Experience I (A)
ASB400	Industrial Experience II (S)

**TABLE 1: SPECIFICATION OF MAJORS**

Detailed information concerning the specification of majors is available from the Faculty Office.

- Notes:**
- In this Table, "hours" means course hours.
  - The hours specified are minima; additional hours/subjects may be undertaken.
  - To satisfy pre-requisite requirements within a given program, it may be necessary to include specific first level and/or second level subjects.

TABLE 1: SPECIFICATION OF MAJORS (Cont.)

Biology (54 Hours)	(i) 12 hours of biology subjects. (ii) Required Supporting Subjects: <ul style="list-style-type: none"> <li>. 6 hours of mathematics subjects, including Statistics I.</li> <li>. 3 hours of computing.</li> <li>. 6 hours of chemistry.</li> </ul>	42 hours of biology subjects, including 21 hours from the third schedule.
Chemistry (Hours) [See also Note (vi)]	(i) 12 hours of chemistry subjects. (ii) Required Supporting Subjects: <ul style="list-style-type: none"> <li>. 9 hours of mathematics subjects.</li> </ul>	45 hours of (57 chemistry subjects, including 21 hours from the third schedule.
Microbiology/ Biochemistry (Hours) also Note (vi)]	(i) 12 hours of chemistry subjects. (ii) Required Supporting Subjects: <ul style="list-style-type: none"> <li>. 9 hours of biology subjects.</li> <li>. 9 hours of subjects from mathematics or computing.</li> </ul>	At least 42 hours of microbiology and (54 biochemistry [See subjects, including 21 hours from the third schedule.
Geology (60 Hours)	(i) 12 hours of geology subjects. (ii) Required Supporting Subjects: <ul style="list-style-type: none"> <li>. 9 hours of subjects from mathematics, physics, chemistry, biology, computing.</li> </ul>	48 hours of geology subjects, including 21 hours from the third schedule.
Mathematics (Hours)	(i) 12 hours of mathematics subjects. (ii) Required Supporting Subjects: <ul style="list-style-type: none"> <li>. 3 hours of additional mathematics.</li> <li>. 3 hours of computing.</li> </ul>	42 hours of (54 mathematics subjects, including 21 hours from the third schedule.
Physics (Hours) [See also Note (vi)]	(i) 12 hours of physics subjects. (ii) Required Supporting Subjects: <ul style="list-style-type: none"> <li>. 12 hours of mathematics subjects, including Statistics I.</li> <li>. 3 hours of computing.</li> </ul>	(i) 48 hours of (60 physics, including at least 21 hours from the third schedule. (ii) 9 hours of mathematics subjects.

NOTES ON THE RULES

- (i) Subjects are presented as units, usually of one semester's duration. Course Hours are defined as average class contact hours per week.
- Consequently, the total contact hours involved in any unit will be equal to its course hours x length of semester in weeks (14). Thus, a unit involving 3 course hours requires an average of 3 hours of class contact per week over 14 weeks, i.e. a total of 42 hours of contact in the semester. It should be noted that the unit may not necessarily be offered at the rate of 3 hours per week throughout the semester.
- (ii) First level subjects are defined to be those listed in the first schedule to the course rules. Second level and third level subjects are defined, respectively, to be those listed in the second and third schedules to the course rules. In general, it is expected that a second level subject will have one or more first level pre-requisite subjects. Similarly, a third level subject is likely to have one or more second level pre-requisite subjects.
- (iii) Sub-major studies and supporting studies may be selected (subject to pre-requisite and timetabling constraints) from any approved area within the University.
- (iv) Instead of the major and sub-major requirement in the typical minimum program as described in Rule 6, students may, in special circumstances and with the approval of the Dean, undertake two majors as defined above or a major and two sub-majors.
- (v) Supporting studies are subjects selected in order to
- complete the required number of course hours (See Rule 1);
  - satisfy pre-requisite or co-requisite requirements;
  - satisfy general requirements for first level programs as indicated in Table 1;
  - increase the scope of the program (eg for a teaching career) by the inclusion of specific skills or additional content.
- (vi) Students wishing to major in Chemistry are encouraged to take Statistics 1 and 3 hours of Computing at first level.  
Students wishing to major in Microbiology/Biochemistry should note that supporting studies taken at first level will affect their choice of subjects in later years because of pre-requisite requirements.  
Students wishing to major in Physics will be required to undertake at least 9 hours of second level Mathematics.
- (vii) Detailed information concerning the specification of majors and sub-majors is available from the Faculty Office or from an academic adviser.

## CHJ129 BACHELOR OF APPLIED SCIENCE - APPLIED CHEMISTRY

1. Entrance Requirements - refer to QUT Admission Procedures booklet.
2. General Course Rules - see relevant section. .
3. For a registered full-time student commencing in 1985 and subsequent years, the subjects and other work comprising the curriculum are set out below. Students who have failed subjects which are no longer offered should consult the Course Coordinator.

### NORMAL COURSE PROGRAM

#### Six Semesters Full-time

	EFTSU	Approx Credit Formal Hrs/wk
<u>Semester 1 - Autumn</u>		
CHB110 Analytical Chemistry I	6	3
CHB150 Organic Chemistry I	8	4
CHB180 Physical & Inorganic Chemistry I	10	5
MAB251 Mathematics I	8	4
PHB110 Physics IA	6	3
PHB111 Physics IB	6	3
CMB104 Professional Communication	12	3
ASB101 Study Support Skills	2	1
<u>Semester 2 - Spring</u>		
CHB210 Analytical Chemistry II	4	2
CHB230 Inorganic Chemistry II	6	3
CHB250 Organic Chemistry II	8	4
CHB270 Physical Chemistry II	8	4
MAB160 Mathematics II	8	4
PHB260 Physics IIG	8	4
* Strand Subject (One only)		
MSB101 A Microbiology I OR	6	3
CSB155 B Introduction to Computing OR	6	3
ESB220 C Mineralogy	6	3
<u>Semester 3 - Autumn</u>		
CHB310 Analytical Chemistry III	8	4
CHB327 Chemical Technology III	6	3
CHB340 Spectroscopy	6	3
CHB350 Organic Chemistry III	10	5
CHB370 Physical Chemistry III	10	5
CSB262 Computing (Strand A & C)# OR	4	2
CSB281 Computer Systems I (Strand B) Strand Subject	6	3
MSB473 A Biochemistry III OR	6	3
PHB308 B Electronics I OR	6	3
ESB320 C Mineral Assemblages	6	3

\* Elective Strand is indicated by A Biochemistry/Microbiology, B Computing/Electronics, or C Geology.

# Students who elect to study elective Strand B Computing/Electronics are required to study CSB281 rather than CSB262. Students electing Strands A or C study CSB262.

		EFTSU	Approx
		Credit	Formal
			Hrs/Wk
<u>Semester 4 - Spring</u>			
CHB427	Chemical Technology IV	8	4
CHB430	Inorganic Chemistry IV	6	3
CHB440	Separation Methods	6	3
CHB450	Organic Chemistry IV	8	4
CHB470	Physical Chemistry IV	8	4
MAB257	Statistics	8	4
Strand Subject			
MSB474	A Biochemistry IV OR	6	3
PHB408	B Electronics II OR	6	3
ESB403	C Geochemistry	6	3
<u>Semester 5 - Autumn</u>			
CHB510	Instrumental Analysis	8	4
CHB527	Chemical Technology V	8	4
CHB530	Inorganic Chemistry V	6	3
CHB550	Organic Chemistry V	8	4
CHB570	Physical Chemistry V	8	4
CHB590	Materials Science	6	3
Strand Subject			
MSB102	A Microbiology II OR	6	3
PHB508	B Electronics III OR	6	3
ESB520	C Applied Geochemistry	6	3
<u>Semester 6 - Spring</u>			
CHB600	Project	20	10
CHB610	Advanced Analysis	4	2
CHB627	Chemical Technology VI	4	2
CHB640	Chemistry VI	4	2
CHB660	Industrial Visits	2	1
MNB040	Management	2	1
Chemistry Elective			
CHB628	Energy Technology OR	6	3
CHB680	Food Science OR	6	3
CHB690	Advanced Materials Science	6	3
Strand Subject			
MSB103	A Microbiology III OR	6	3
CHB618	B Laboratory Automation OR	6	3
ESB411	C Earth Resources	6	3

4. Cooperative Education Option - One year's paid industrial experience.

A registered student who has completed the equivalent of the first and second years of the standard full-time course, normally with a WGA of not less than 4.5 overall, may, at the discretion of the Cooperative Education Program Coordinator, undertake the Cooperative Education option.

This involves 10-12 months of paid full-time employment in an approved industrial/commercial environment during which time the student will be enrolled in the units Industrial Experience I (First Semester) and Industrial Experience II (Second Semester). On completion of the approved industrial experience the student resumes formal studies.

A normal mode of progression leading to the award of the degree for such students is as follows:

#### FIRST AND SECOND YEAR

Standard full-time course described in Rule 3.

#### THIRD YEAR

##### Semester 5 - Autumn

ASB310 Industrial Experience I

##### Semester 6 - Spring

ASB410 Industrial Experience II

#### FOURTH YEAR

Third year of the standard full-time course described in Rule 3.

5. For a registered part-time student commencing in 1984 or subsequent years, the subjects and other work comprising the curriculum are as follows:

#### NORMAL COURSE PROGRAM

Twelve Semesters Part-time

EFTSU Credit	Approx Formal Hrs/wk
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##### Semester 1 - Autumn

CHB110	Analytical Chemistry I	6	3
CHB180	Physical & Inorganic Chemistry I	10	5
PHB110	Physics IA	6	3
PHB111	Physics IB	6	3
ASB101	Study Support Skills	2	1

##### Semester 2 - Spring

CHB150	Organic Chemistry I	8	4
CMB104	Professional Communication	12	3
CHB210	Analytical Chemistry II	4	2
MAB251	Mathematics I	8	4

##### Semester 3 - Autumn

CHB230	Inorganic Chemistry II	6	3
CHB250	Organic Chemistry II	8	4
MAB160	Mathematics II	8	4

##### Semester 4 - Spring

CHB270	Physical Chemistry II	8	4
PHB260	Physics IIC	8	4
	* Strand Subject		
MSB101	A Microbiology I OR	6	3
CSB155	B Introduction to Computing OR	6	3
ESB220	C Mineralogy	6	3

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\* Elective Strand is indicated by A, B or C.

		EFTSU Approx Credit	Formal Hrs/wk
<u>Semester 5 - Autumn</u>			
CHB370	Physical Chemistry III	10	5
CHB430	Inorganic Chemistry IV	6	3
CSB262	Computing (Strand A & C)# OR	4	2
CSB281	Computer Systems I (Strand B) * Strand Subject	6	3
MSB473	A Biochemistry III OR	6	3
PHB308	B Electronics OR	6	3
ESB320	C Mineral Assemblages	6	3
<u>Semester 6 - Spring</u>			
CHB310	Analytical Chemistry III	8	4
CHB340	Spectroscopy	6	3
CHB350	Organic Chemistry III	10	5
<u>Semester 7 - Autumn</u>			
CHB327	Chemical Technology III	6	3
CHB450	Organic Chemistry IV	8	4
CHB470	Physical Chemistry IV	8	4
<u>Semester 8 - Spring</u>			
CHB427	Chemical Technology IV	8	4
CHB440	Separation Methods	6	3
MAB257	Statistics Strand Subject	8	4
MSB474	A Biochemistry IV OR	6	3
PHB408	B Electronics II OR	6	3
ESB403	C Geochemistry	6	3
<u>Semester 9 - Autumn</u>			
CHB550	Organic Chemistry V	8	4
CHB570	Physical Chemistry V Strand Subject	8	4
MSB102	A Microbiology II OR	6	3
PHB508	B Electronics III OR	6	3
ESB520	C Applied Geochemistry	6	3
<u>Semester 10 - Spring</u>			
CHB527	Chemical Technology V	8	4
CHB530	Inorganic Chemistry V	6	3
CHB590	Material Science Strand Subject	6	3
MSB103	A Microbiology III OR	6	3
CHB618	B Laboratory Automation OR	6	3
ESB411	C Earth Resources	6	3

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\* Elective Strand is indicated by A, B or C.

# Students who elect to study Elective Strand B are required to study CSB281 rather than CSB262. Students electing strands A or C study CSB262.

110 Bachelor of Applied Science - Applied Chemistry

	EFTSU Credit	Approx Formal Hrs/wk
<u>Semester 11 - Autumn</u>		
CHB510 Instrumental Analysis	8	4
CHB601-1Project	10	4
CHB627 Chemical Technology VI	4	2
CHB640 Chemistry VI	4	2
<u>Semester 12 - Spring</u>		
CHB610 Advanced Analysis	4	2
CHB601-2Project	10	6
CHB660 Industrial Visits	2	1
MNB040 Management	2	1
#Chemistry Elective		
CHB628 Energy Technology OR	6	3
CHB680 Food Science OR	6	3
CHB690 Advanced Material Science	6	3

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# It is not intended that all Chemistry Elective units will be offered. Those units offered in any one year will be determined by the student demand.

## ESJ132 BACHELOR OF APPLIED SCIENCE - APPLIED GEOLOGY

1. Entrance Requirements - refer to QUT Admission Procedures booklet.
2. General Course Rules - see relevant section.
3. A registered student may only enrol in the full-time course.
4. For a registered student the subjects and other work comprising the curriculum of the six semesters of study are as follows -

		EFTSU Credit	Approx Formal Hrs/wk
<u>Semester 1 - Autumn</u>			
ESB101	Earth Science IA	6	3
ESB102	Earth Science IB	6	3
CHB101	Chemistry IA	6	3
CHB102	Chemistry IB	6	3
PHB110	Physics IA	6	3
PHB111	Physics IB	6	3
MAB201	Mathematics IA	8	4
ASB101	Study Support Skills	2	1
<u>Semester 2 - Spring</u>			
ESB201	Earth Science IIA	6	3
ESB202	Earth Science IIB	6	3
CHB201	Chemistry IIA	6	3
CHB202	Chemistry IIB	6	3
PHB210	Physics IIA	6	3
MAB208	Statistics I	6	3
MAB162	Mathematics IIG	3	1.5
CMB104	Professional Communication	12	3
<u>Semester 3 - Autumn</u>			
MAB258	Experimental Design	4	2
ESB313	Mineralogy	8	4
ESB393	Field Techniques	6	3
SVB303	Surveying for Geologists	6	3
ESB353	Structural Geology III	4	2
ESB363	Economic Geology III	8	4
MNB025	Economic Analysis for Geologists§	4	2
CHB343	Chemistry for Geologists III	8	4
ESB383	Field Excursions III	2	1
<u>Semester 4 - Spring</u>			
ESB403	Geochemistry	6	3
ESB413	Petrology IV	8	4
ESB493	Stratigraphy & Sedimentation	10	5
ESB433	Geophysics	4	2
ESB443	Introduction to Groundwater & Petroleum	6	3
ESB473	Law for Geologists#	4	2
ESB483	Field Excursions IV	2	1
CSB260	Introduction to Programming	4	2
ESB453	Applied Geomorphology	6	3

		EFTSU Credit	Approx Formal Hrs/wk
<u>Semester 5 - Autumn</u>			
ESB513	Economic Geology V	8	4
ESB533	Exploration Geochemistry	8	4
ESB543	Petrology V	6	3
ESB593	Sedimentary Petrology	6	3
ESB563	Project V	6	3
ESB573	Field Excursions V	4	2
ESB633	Exploration Geophysics	6	3
MNB026	Administration for Geologists#	6	3
<u>Semester 6 - Spring</u>			
ESB523	Hydrogeology	6	3
ESB613	Mineragraphy & Mining Geology	6	3
ESB603	Petroleum & Coal Geology	10	5
ESB643	Structural Geology VI	6	3
ESB653	Engineering Geology	6	3
ESB663	Project VI	8	4
ESB673	Field Excursions VI	4	2
ESB693	Mining Property Evaluation§	4	2

5. Cooperative Education Option - One year's paid industrial experience.

A registered student who has completed the equivalent of the first and second years of the standard full-time course, normally with a WCA of not less than 4.5 overall, may, at the discretion of the Cooperative Education Program Coordinator, undertake the Cooperative Education option.

This involves 10-12 months of paid full-time employment in an approved industrial/commercial environment during which time the student will be enrolled in the units Industrial Experience I (First Semester) and Industrial Experience II (Second Semester). On completion of the approved industrial experience the student resumes formal studies.

A normal mode of progression leading to the award of the degree for such students is as follows:

**FIRST AND SECOND YEAR**

Standard full-time course described in Rule 4.

**THIRD YEAR**

Semester 5 - Autumn

ASB320 Industrial Experience I

Semester 6 - Spring

ASB420 Industrial Experience II

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§ Offered only in even numbered years.

# Offered only in odd numbered years.

FOURTH YEAR

Third year of the standard full-time course described in Rule 4.

6. Student may be required to attend intensive segments of course work at weekends and in QUT recess periods (normally to fulfil field work requirements of the course).

## MAJ133 BACHELOR OF APPLIED SCIENCE - MATHEMATICS

1. Entrance Requirements - refer to QUT Admission Procedures booklet.
2. General Course Rules - see relevant section.
3. Criteria for the Award of the Degree of Bachelor of Applied Science - Mathematics.

To be eligible for the award of the degree of Bachelor of Applied Science - Mathematics, a registered student will have successfully completed a study program which is in accord with the following criteria:

The course of study will comprise subject units selected from the list given below, having regard to specified pre-requisites and co-requisites, and include:

- (i) all 14 mandatory units;
- (ii) at least 14 units above first year level;
- (iii) at least 4 Mathematics units above second year level;
- (iv) at least 28 units having a minimum total tuition time of 84 semester hours of scheduled lecture/practical work.

### FIRST YEAR LEVEL -

	EFTSU	Approx Credit Formal Hrs/wk
MAB301*	10	3
MAB302*	10	3
CSB155*	6	3
1SB493*	12	3
MAB331*	10	3
MAB310*	10	3
MAB342*	10	3
MAB317*	10	3
MAB318*	10	3
MAB309*	10	3
CMB104	12	3
* First year elective units		3-6
* First year elective units		3-6
First year elective units		3-6
First year elective units		3-6

### SECOND YEAR LEVEL -

MAB601*	10	3
MAB612*	10	3
MAB602	10	3
CSB281	10	3
MAB608	10	3
MAB610	10	3
MAB618	10	3
MAB619	10	3
MAB637	10	3
MAB638	10	3

		EFTSU Credit	Approx Formal Hrs/wk
<b>SECOND YEAR LEVEL (Cont.) -</b>			
MAB635	Classical Theoretical Mechanics	10	3
MAB641	Actuarial Mathematics	10	3
	Second year elective units		3-9
	Second year elective units		3-9

**THIRD YEAR LEVEL -**

MAB906	Topics in Analysis	10	3
MAB907	Mathematical Statistics IIIA	10	3
MAB908	Mathematical Statistics IIIB	10	3
MAB913	Numerical Analysis III	10	3
MAB920	Coding & Encryption Techniques	10	3
MAB921	Methods of Mathematical Physics A	10	3
MAB924	Applied Statistical Techniques	10	3
MAB927	Operations Research IIA	10	3
MAB928	Operations Research IIB	10	3
MAB929	Statistical Forecasting	10	3
MAB941	Methods of Mathematical Economics	10	3
MAB960	Project Work	10	3

**NOTE:**

- (i) The units which are asterisked are mandatory; the remainder are referred to as optional; optional units include approved elective units offered by other Departments or Schools (see (ii)).
- (ii) The choice of 'elective units' will be subject to timetabling constraints, but elective groupings for which timetabling arrangements may be expected to be made will include selections from the programs offered by the following Faculties: Science, Business, Information Technology. No more than four elective units may be counted as second year level subjects. Students are required to consult the Head of Department prior to their initial enrolment in an elective unit.
- (iii) For the purpose of this rule, when computing the total semester hours for a particular program, the numerals in the above table which indicate the semester hours applicable to particular units will be used.
- (iv) A cooperative education option is available within the program after the successful completion of the equivalent of four semesters of full-time study. It involves a period of 10 - 12 months of paid full-time employment in an approved industrial/commercial environment. During this period, students will be enrolled in the following units:

ASB330 Industrial Experience I (Semester I);  
 ASB430 Industrial Experience II (Semester II).

A description of a normal mode of progression by students undertaking this option is given in Rule 5 below.

## 4. Standard Full-time Course - 3 year program.

For a registered student in the full-time course, a normal mode of progression which enables the units and other work comprising the curriculum of the six semesters of study to be completed in the standard time is as follows -

## EXAMPLE OF POSSIBLE COURSE

## FIRST YEAR

<u>Semester 1 - Autumn</u> (Total Semester Hrs/Wk 15)		Approx Formal Hrs/Wk
MAB301	Calculus & Analysis A	3
CSB155	Introduction to Computing	3
MAB309	Modern Algebra	3
MAB317	Mathematical Statistics I	3
MAB331	Introductory Vector Analysis	3

Semester 2 - Spring (Total Semester Hrs/Wk 15)

MAB302	Calculus & Analysis B	3
ISB493	Business Computer Programming	3
MAB310	Linear Algebra	3
MAB318	Mathematical Statistics IIA	3
MAB342	Mathematics of Finance	3

## SECOND YEAR

Semester 3 - Autumn (Total Semester Hrs/Wk 15-21)

MAB601	Multivariable Calculus A	3
	First Year Elective Unit	3-6
	Three subject units chosen from List A	9-12

Semester 4 - Spring (Total Semester Hrs/Wk 15-21)

MAB612	Differential Equations	3
	First Year Elective Unit	3-6
	Three subject units chosen from List B	9-12

## THIRD YEAR

Semester 5 - Autumn (Total Semester Hrs/Wk 12-18)

	Two subject units from List C	6
	Two subject units from Lists A & C	6-12

Semester 6 - Spring (Total Semester Hrs/Wk 12-18)

	Two subject units from List D	6
	Two subject units from Lists B & D	6-12

<u>List A</u>		Approx Formal Hrs/wk
CMB104	Professional Communication	3
CSB281	Computer Systems I	3
MAB608	Mathematical Statistics IIB	3
MAB619	Numerical Analysis II	3
MAB637	Operations Research IA	3
MAB638	Operations Research IB	3
MAB635	Classical Theoretical Mechanics	3
MAB641	Actuarial Mathematics	
	First year elective unit/s	3-6
	Second year elective unit/s	3-9

<u>List B</u>		
CMB104	Professional Communication	3
MAB602	Multivariable Calculus C	3
MAB608	Mathematical Statistics IIB	3
MAB610	Applied Linear Algebra	3
MAB618	Numerical Analysis I	3
MAB637	Operations Research IA	3
MAB638	Operations Research IB	3
	First year elective unit/s	3-6
	Second year elective unit/s	3-9

<u>List C</u>		
MAB907	Mathematical Statistics IIIA	3
MAB921	Methods of Mathematical Physics A	3
MAB927	Operations Research IIA	3
MAB929	Statistical Forecasting	3
MAB941	Methods of Mathematical Economics	3
MAB960	Project Work	3

<u>List D</u>		
MAB906	Topics in Analysis	3
MAB908	Mathematical Statistics IIIB	3
MAB913	Numerical Analysis III	3
MAB920	Coding & Encryption Techniques	3
MAB924	Applied Statistical Techniques	3
MAB928	Operations Research IIB	3
MAB960	Project Work	3

NOTE:

- (i) Students must consult the Head of Department prior to initial enrolment in elective units to ensure that they are fully aware of the particular knowledge requirements specified for the professions serviced by the course.

5. Cooperative Education Option - One year's paid industrial experience.

A registered student who has completed the equivalent of the first and second years of the standard full-time course, normally with a WGA of not less than 4.5 overall, may, at the discretion of the Cooperative Education Program Coordinator, undertake the Cooperative Education option.

This involves 10-12 months of paid full-time employment in an approved industrial/commercial environment during which time the student will be enrolled in the units Industrial Experience I (First Semester) and Industrial Experience II (Second Semester). On completion of the approved industrial experience the student resumes formal studies.

A normal mode of progression leading to the award of the degree for such students is as follows:

#### FIRST AND SECOND YEAR

Standard full-time course described in Rule 4.

#### THIRD YEAR

##### Semester 5 - Autumn

ASB330 Industrial Experience I

##### Semester 6 - Spring

ASB430 Industrial Experience II

#### FOURTH YEAR

Third year of the standard full-time course described in Rule 4.

6. Standard part-time course - 6 year program.

For a registered student in the part-time course commencing in the Autumn Semester, a normal mode of progression which enables the units and other work comprising the curriculum of the twelve semesters of study to be completed in the standard time is as follows -

#### EXAMPLE OF POSSIBLE COURSE

#### FIRST YEAR

##### Semester 1 - Autumn (Total Semester Hrs/Wk 6)

MAB310	Linear Algebra	3
MAB342	Mathematics of Finance	3

##### Semester 2 - Spring (Total Semester Hrs/Wk 9)

MAB301	Calculus & Analysis A	3
CSB155	Introduction to Computing	3
MAB317	Mathematical Statistics I	3

	Approx Formal Hrs/Wk
<u>Semester 3 - Autumn</u> (Total Semester Hrs/Wk 9)	
MAB302    Calculus & Analysis B	3
ISB493    Business Computer Programming	3
MAB318    Mathematical Statistics IIA	3
<u>Semester 4 - Spring</u> (Total Semester Hrs/Wk 6)	
MAB309    Modern Algebra	3
MAB331    Introductory Vector Analysis	3
<u>Semester 5 - Autumn</u> (Total Semester Hrs/Wk 6-9)	
MAB612    Differential Equations	3
First year elective unit	3-6
<u>Semester 6 - Spring</u> (Total Semester Hrs/Wk 6-9)	
MAB601    Multivariable Calculus A	3
First year elective unit	3-6
<u>Semester 7 - Autumn</u> (Total Semester Hrs/Wk 9-12)	
Three subject units from List A	9-12
<u>Semester 8 - Spring</u> (Total Semester Hrs/Wk 6-12)	
Two subject units from List B	
<u>Semester 9 - Autumn</u> (Total Semester Hrs/Wk 9-12)	
Three subject units from Lists A & C	9-12
<u>Semester 10 - Spring</u> (Total Semester Hrs/Wk 6-12)	
Two subject units from Lists B & D	6-12
<u>Semester 11 - Autumn</u> (Total Semester Hrs/Wk 6-12)	
Two subject units from Lists A & C	6-12
<u>Semester 12 - Spring</u> (Total Semester Hrs/Wk 6-12)	
Two subject units from Lists B & D	6-12

LISTS A - D SET OUT IN RULE 4 ALSO PERTAIN TO PART-TIME STUDENTS.

NOTE:

- (i) Students must consult the Head of Department prior to initial enrolment in elective units to ensure that they are fully aware of the particular knowledge requirements specified for the professions serviced by the course.
- (ii) Registered students may be accepted into the part-time course in the Spring Semester. A normal mode of progression in these cases is available from the Department on request.



Diploma Courses

**PHK205 DIPLOMA OF APPLIED SCIENCE -  
DIAGNOSTIC RADIOGRAPHY**

1. Entrance Requirements - refer to QUT Admission Procedures booklet.
2. General Course Rules - see relevant section.
3. This program is under review. A new course program will be introduced in 1989. Details are not available at the time of printing this Handbook.

Students entering the first year of the course in 1989 should refer to the Faculty of Science for details of the new program.

Continuing Students (second and third year) will undertake the program indicated below for semesters 3 - 6. Continuing students must be trainees who have employment within an approved Department or Practice.

4. As set out in Rule 5, the course is comprised of two semesters of full-time attendance at the QUT to undertake formal course work, three semesters of full-time attendance in the clinical situation, and one semester of part-time clinical and part-time formal course work.
5. For a registered student in the Diagnostic Radiography course, the subjects and other work comprising the curriculum are as follows -

EFTSU Approx  
Credit Formal  
Hrs/wk

Semester 3 -

Full-time attendance in the clinical situation.

PHD377 Clinical Practice IID	46	
PHD310 Radiographic Technology	2	1

Semester 4 -

Full-time attendance at QUT.

Subjects undertaken during this semester are -

PHD471 Radiobiology & Protection	4	2
PHD472 Radiographic Physics II	4	2
PHD473 Radiographic Technique II	6	3
PHD474 Radiographic Equipment II	10	5
PHD475 Ultrasonics	4	2
PHD477 Radiographic Practice II	4	2
MSD420 Pathology	8	4
PND411 Applied Radiographic Anatomy	4	2
MND129 Psychology for Health Professionals A	4	2

EFTSU Approx  
Credit Formal  
Hrs/wk

Semester 5 -

Part-time attendance in the clinical situation  
with part-time attendance at QUT.

PHD572	Complementary Imaging Techniques	8	4
PHD573	Radiographic Technique III	6	3
PHD574	Radiographic Equipment III	6	3
PHD577	Clinical Practice IIID	16	
CMB104	Professional Communication OR equivalent elective	12	3

Semester 6 -

Full-time attendance in the clinical situation

PHD677	Clinical Practice IVD	44	
PHD610	Advanced Radiographic Technique	4	2

**PHK206 DIPLOMA OF APPLIED SCIENCE -  
THERAPEUTIC RADIOGRAPHY**

1. Entrance Requirements - refer to QUT Admission Procedures booklet.
2. General Course Rules - see relevant page.
3. This program is under review. A new course program will be introduced in 1989. Details are not available at the time of printing this Handbook.

Students entering the first year of the course in 1989 should refer to the Faculty of Science for details of the new program.

Continuing Students (second and third year) will undertake the program indicated below for semesters 3 - 6. Continuing students must be trainees who have employment within an approved Department or Practice.

4. As set out in Rule 5, the course is comprised of one semester of full-time attendance at the QUT to undertake formal course work, and five semesters of attendance in the clinical situation with course work undertaken at the QUT by day release or evening classes.
5. For a registered student in the Therapeutic Radiography course, the subjects and other work comprising the curriculum are as follows -

<u>Semester 3 -</u>	EFTSU Approx Credit Formal Hrs/wk
Attendance in clinical situation with day release to undertake formal course work at QUT.	
PHD382 Radiotherapy Physics II	6 3
PHD383 Principles of Treatment I	5 2.5
PHD387 Clinical Practice IIT	27
PHD384 Radiotherapy Practice III	6 3

Semester 4 -

Attendance in clinical situation with day release to undertake formal course work at QUT.

PHD485 Principles of Treatment II	4 2
PHD486 Radiotherapy Practice IV	6 3
PHD487 Clinical Practice IIIT	30
MND129 Psychology for Health Professions A	4 2

EFTSU Approx  
Credit Formal  
Hrs/wk

**Semester 5 -**

Attendance in clinical situation with day release  
to undertake formal course work at QUT.

PHD586	Radiotherapy Practice V	6	3
PHD580	Complementary & Evolving Techniques I	8	4
PHD587	Clinical Practice IVT	30	

**Semester 6 -**

Attendance in clinical situation with day release  
to undertake formal course work at QUT.

PHD680	Complementary & Evolving Techniques II	6	3
PHD471	Radiobiology & Protection	4	2
PHD687	Clinical Practice VI	22	
CMB104	Professional Communication OR equivalent elective	12	3



Associate Diploma Course

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**ASL225 ASSOCIATE DIPLOMA IN APPLIED SCIENCE**


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THIS COURSE REPLACES THE ASSOCIATE DIPLOMA IN APPLIED BIOLOGY AND THE ASSOCIATE DIPLOMA IN APPLIED CHEMISTRY.

1. Entrance Requirements - refer to QUT Admission Procedures booklet.
2. General Course Rules - see relevant section.
3. A registered student may enrol either as a full-time student or a part-time student.
4. In the first semester full-time students will enrol in the following program:

<u>Semester 1 -</u>	EFTSU Approx	
	Credit	Formal Hrs/wk
BEA108 Introductory Biology	6	3
BEA198 Microscopy Techniques	6	3
CHA111 Laboratory Techniques	6	3
CHA145 Introductory Chemistry	8	4
MAA251 Statistics & Data Processing	4	2
CHA133 Communication Techniques	4	2
PHA154 Introductory Physics	6	3

5. At the end of the first semester of the course, full-time students are required to choose to study in either the biology strand or the chemistry strand as set out below. Some subjects are common to both strands.

Students who commenced the course prior to 1988 should see the notes on the rules on page 219.

**(A) BIOLOGY STRAND**

<u>Semester 2 - Spring</u>	EFTSU Approx	
	Credit	Formal Hrs/wk
BEA200* Biology B	6	3
BEA202 Cell Structure & Function	6	3
BEA296 Data Presentation Techniques	4	2
BEA297 Biological Data Handling	6	3
CHA218 Analytical Chemistry I	6	3
CHA240 Instrumental Techniques	7	3.5
MSA113 Introductory Biochemistry	6	3
PHA354 Photographic Techniques	2	1

Semester 3 - Autumn

BEA303 Environmental Biology	6	3
BEA339* Introduction to Bioculture	6	3
BEA349* Computer Applications in Biology	6	3
BEA399* Applications in Electron Microscopy	6	3
CHA112 Workshop Practice	3	1.5
CHA442 Introduction to Occupational Safety	4	2

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\* See Note A on Rules.

<u>Semester 3 - Autumn (Con't)</u>		EFTSU Approx Credit Formal Hrs/wk	
	Electives - two of		
BEA004	Taxonomy	6	3
BEA016	Aquaculture Techniques	6	3
BEA021	Plant Physiology	6	3
BEA060	Hydrobiological Techniques or other approved electives	6	3

Semester 4 - Spring

BEA398	Animal & Plant Techniques	12	6
BEA405	Population Biology	8	4
BEA498	Field Techniques	12	6
MSA162*	Microbiology II	6	3
	Elective - one of		
BEA011	Animal Physiology	6	3
BEA026	Plant Cell & Tissue Culture	6	3
CSA259	Introduction to Computing or another approved elective	4	2

Students should discuss their choice of electives with the strand coordinator.

## (B) CHEMISTRY STRAND

<u>Semester 2 - Spring</u>		EFTSU Approx Credit Formal Hrs/wk	
CHA218	Analytical Chemistry I	6	3
CHA219	Qualitative Analysis	6	3
CHA230	Chemistry of Inorganic Materials	4	2
CHA270	Physical Chemistry I	7	3.5
CHA240	Instrumental Techniques	7	3.5
CHA250	Organic Chemistry I	7	3.5
CSA259	Introduction to Computing	4	2
PHA258	Introductory Electronics	4	2
<u>Semester 3 - Autumn</u>			
CHA112	Workshop Practice	3	1.5
CHA318	Instrumental Analytical Chemistry	8	4
CHA319	Analytical Chemistry II	6	3
CHA370	Physical Chemistry II	4	2
CHA320	Chemical Process Principles I	6	3
CHA350	Organic Chemistry II	6	3
CHA442	Introduction to Occupational Safety	4	2
	Elective - one of		
CHA580	Food Chemistry I OR	6	3
ESA310	Geology OR	6	3
MSA161	Microbiology I OR any other approved elective	6	3

\* See Note A on Rules.

<u>Semester 4 - Spring</u>		EFTSU Credit	Approx Formal Hrs/wk
CHA368	Industrial Chemistry	6	3
CHA670	Physical Chemistry III	6	3
CHA410	Computers in Chemistry	6	3
CHA610	Industrial Analysis	6	3
CHA550	Organic Chemistry III Liberal Studies unit#	6	3
	Elective - one of		
CHA680	Food Chemistry II OR	6	3
ESA510	Mineralogy Techniques OR	6	3
MSA162	Microbiology II OR	6	3
CHA520	Chemical Process Principles II OR any other approved elective	6	3

6. In the first year of study part-time students will enrol in the following program:

<u>Semester 1 - Autumn</u>		EFTSU Credit	Approx Formal Hrs/wk
BEA108	Introductory Biology	6	3
CHA145	Introductory Chemistry	8	4
PHA154	Introductory Physics	6	3

Semester 2 - Spring

BEA198	Microscopy Techniques	6	3
CHA111	Laboratory Techniques	6	3
MAA251	Statistics & Data Processing	4	2
CMA133	Communication Techniques	4	2

7. At the end of their first year of study, part-time students must choose to continue in either the biology strand or the chemistry strand as set out below. Some subjects are common to both strands.

(A) BIOLOGY STRAND

<u>Semester 3 - Autumn</u>		EFTSU Credit	Approx Formal Hrs/wk
BEA202	Cell Structure & Function	6	3
BEA297	Biological Data Handling	6	3
CHA218	Analytical Chemistry I	6	3

Semester 4 - Spring

CHA240	Instrumental Techniques	7	3.5
MSA113	Introductory Biochemistry	6	3
PHA354	Photographic Techniques	2	1
BEA200*	Biology B	6	3

- # Any subject to which a student is eligible to be admitted may be selected, provided it is of at least 2 hours of formal contact per week and is approved by the Head of the Chemistry Department.

- \* See Note A on Rules.

	EFTSU Credit	Approx Formal Hrs/wk
<u>Semester 5 - Autumn</u>		
BEA303 Environmental Biology	6	3
BEA349* Computer Applications in Biology	6	3
BEA399* Applications in Electron Microscopy#	6	3
<u>Semester 6 - Spring</u>		
BEA296 Data Presentation Techniques	4	2
BEA398 Animal & Plant Techniques#	12	6
MSA162* Microbiology II	6	3
<u>Semester 7 - Autumn</u>		
BEA339* Introduction to Bioculture	6	3
CHA112 Workshop Practice**	3	1.5
CHA442 Introduction to Occupational Safety**	4	2
Electives - two of		
BEA004 Taxonomy	6	3
BEA016 Aquaculture Techniques	6	3
BEA021 Plant Physiology	6	3
BEA060 Hydrobiological Techniques	6	3
BEA090 External Project I	6	3
BEA099 External Project II or other approved electives	6	3
<u>Semester 8 - Spring</u>		
BEA405 Population Biology+	8	4
BEA498 Field Techniques+ Elective - one of	12	6
BEA011 Animal Physiology	6	3
BEA026 Plant Cell & Tissue Culture	6	3
BEA090 External projects I	6	3
BEA099 External Projects II	6	3
CSA259 Introduction to Computing or another approved elective	4	2
 (B) CHEMISTRY STRAND		
<u>Semester 3 - Autumn</u>		
CHA218 Analytical Chemistry I	6	3
CHA270 Physical Chemistry I	7	3.5
CHA230 Chemistry of Inorganic Materials	4	2
CHA250 Organic Chemistry I	7	3.5

\* See Note A on Rules.

\*\* Students in appropriate employment may claim exemption from these subjects.

# Day release will be required.

+ Day release (one week total) will be required for the field component of these subjects which have a joint field excursion.

		EFTSU Credit	Approx Formal Hrs/wk
<u>Semester 4 - Spring</u>			
CHA219	Qualitative Analysis	6	3
CHA240	Instrumental Techniques	7	3.5
CHA350	Organic Chemistry II	6	3
PHA258	Introductory Electronics	4	2
<u>Semester 5 - Autumn</u>			
CHA112	Workshop Practice	3	1.5
CHA318	Instrumental Analytical Chemistry	8	4
CHA370	Physical Chemistry II	4	2
CHA319	Analytical Chemistry II	6	3
<u>Semester 6 - Spring</u>			
CHA550	Organic Chemistry III	6	3
CHA610	Industrial Analysis	6	3
CHA670	Physical Chemistry III	6	3
CSA259	Introduction to Computing	4	2
<u>Semester 7 - Autumn</u>			
CHA320	Chemical Process Principles I	6	3
CHA442	Introduction to Occupational Safety Liberal Studies unit# Elective - one of	4	2
CHA580	Food Chemistry I OR	6	3
ESA310	Geology OR	6	3
MSA161	Microbiology I OR any other approved elective	6	3
<u>Semester 8 - Spring</u>			
CHA410	Computers in Chemistry	6	3
CHA368	Industrial Chemistry Elective - one of	6	3
CHA680	Food Chemistry II OR	6	3
ESA510	Mineralogy Techniques OR	6	3
MSA162	Microbiology II OR	6	3
CHA520	Chemical Process Principles II OR any other approved elective	6	3

8. Students in the Biology strand may apply to have their current employment arranged and assessed in lieu of one or more electives. In such cases, the employer, in consultation with the Head of Department, will nominate an honorary supervisor to collaborate with a departmental tutor. Under such an arrangement students will be required to maintain a work log and complete such exercises and assignments as required.

# Any subject to which a student is eligible to be admitted may be selected, provided it is of at least 2 hours of formal contact per week and is approved by the Head of the Chemistry Department.

9. Students in the Biology strand with relevant technical experience may seek total or partial exemption from one or more of the elective units of the course.
10. Students will participate in excursions and field work where these form part of the curriculum. Occasionally field work may be scheduled at weekends or during QUT recess periods.

#### NOTES ON THE RULES:

Students whose programs have differed from the normal one and who have any difficulties in subject sequences due to the introduction of the new course in 1988 should consult the Strand Coordinator prior to enrolment in 1989.

#### (A) Biology Strand:

Students enrolled in this strand prior to 1988 should:

- (i) Undertake the course of study as set out above except for those subjects marked with an asterisk, and
- (ii) Undertake twelve (12) hours of electives in addition to the course of study listed above. In addition to the normal electives, students may choose electives from subjects that are marked with an asterisk in the main course of study. Students who have passed one or more of BEA389 Visits & Excursions III, BEA489 Visits & Excursions IV, CSA163 Computing, may claim these subjects as electives.

#### (B) Chemistry Strand:

- (i) Students who were enrolled prior to 1988 should consult the strand coordinator regarding a suitable program. A list of equivalent subjects is set out below.

#### (ii) Equivalent Subjects:

CHA145: CHA120 + CHA140  
 CHA240 + PHA258: CHA340  
 BEA303: BEA403  
 BEA405: BEA305  
 CHA442: CHA440  
 CHA250 + CHA270: CHA250 + CHA270 + CHA220  
 CSA259: CSA163  
 CHA368 + CHA410: CHA368 + CHA410 + CHA460



## Prizes and Awards



## PRIZES AND AWARDS

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### L G Amos Prize

Awarded each year to the graduand from the multidisciplinary Bachelor of Applied Science with major studies in Chemistry who, in the opinion of the Head of the Department of Chemistry, obtains the best academic record over the length of the course.

### Australasian Institute of Mining & Metallurgy Bursaries

Awarded to the students of the Bachelor of Applied Science course in Applied Geology who show the most outstanding potential in completing the course.

### Australian Laboratory Services Pty Ltd Prize

Awarded to a full-time or part-time student of the Bachelor of Applied Science course in Applied Chemistry or the multidisciplinary Bachelor of Applied Science course with major studies in Chemistry, who obtains the best overall achievement in the final year Analytical Chemistry subjects.

### David Barry Memorial Prize

Awarded to the graduate with the best overall academic performance in the biology strand of either the Associate Diploma in Applied Science or the Bachelor of Applied Science.

### Canberra - Packard Prize

Awarded to the graduand undertaking major studies in Physics who has obtained the best academic record in the final year of the multidisciplinary Bachelor of Applied Science course.

### Castlemaine Perkins Scholarship in Applied Chemistry

This scholarship is offered annually for a period of one academic year. Eligible students are those who satisfactorily complete the third semester of the full-time program of the course Bachelor of Applied Science - Applied Chemistry. The scholarship takes the form of a stipend and a book allowance, together with periods of vacation employment. Further details of the scholarship can be obtained from the Department of Chemistry. Applications must be submitted on or before August 31 of each year.

### CRAE Mapping Prize

Donated by CRA Exploration Pty Ltd and awarded to the best project student in the Bachelor of Applied Science - Applied Geology course for demonstrated ability in geological mapping.

### George Edward Curphey Prize in Mathematics

Awarded to the student enrolled in the Bachelor of Applied Science - Mathematics course who, in the opinion of the Head of the Department of Mathematics, is the most academically outstanding graduate of the year.

**George Edward Curphey Prize in Theoretical Mechanics**

Awarded to the student who obtains the best performance of the year in 'Classical Theoretical Mechanics' or 'Mathematics VA', providing that the Head of Department judges him/her to be of sufficiently outstanding merit.

**Clare Falconer Memorial Prizes**

Donated through the Queensland Branch of the Australian Institute of Radiography and awarded to the students in the first and second years of the Diploma of Applied Science - Therapeutic Radiography course who obtain the best academic records (as determined from awarded grades) for that year.

**Hugo Flecker Memorial Prizes**

Donated by the Australasian College of Radiologists, Queensland Branch, and awarded to students in the third year of the Diploma of Applied Science - Diagnostic Radiography and the Diploma of Applied Science - Therapeutic Radiography courses respectively, who obtain the best academic records (as determined from awarded grades) in that year.

**JL Forsyth Prize**

Donated by Meadow Lea Foods and awarded to the student who has shown the greatest proficiency in the subjects of the fifth and sixth years of the part-time course for the Bachelor of Applied Science - Applied Chemistry.

**GEC Electronics Products & Systems Division Prize**

Donated by GEC Electronic Products & Systems Division and awarded to the student who, in the second year of the Diploma of Applied Science - Diagnostic Radiography course, obtains the best academic record (as determined from awarded grades) for that year.

**Geological Society of Australia Medal**

Awarded to the graduand who obtains the best results in the Bachelor of Applied Science course in Applied Geology.

**Colin Graham Memorial Prize**

Awarded from monies held in trust to the graduand from the Bachelor of Applied Science - Applied Chemistry degree course who, in the opinion of the Head of the Department of Chemistry, has the best academic record over the length of the course.

**Julius Kruttschnitt Education Fund**

This fund has been established by the Southern Queensland Branch of the Australasian Institute of Mining and Metallurgy to provide assistance to students of geology, mining, petroleum or metallurgy from any university or college of advanced education in Queensland.

Grants are made to students who find themselves with monetary problems while pursuing their studies. Successful applicants must belong to the Australasian Institute of Mining and Metallurgy. The value and duration of the award are dependent on each applicant's circumstances. Applications may be made at any time during the year and should be addressed to the Honorary Secretary, Julius Kruttschnitt Education Fund, GPO Box 1433, Brisbane, Q. 4001.

#### Kodak Prize

Awarded to the student in the Diploma of Applied Science - Diagnostic Radiography who obtains the best academic record (as determined from awarded grades) for the course completed in that year.

#### MIM Holdings Limited Prize

Awarded to the student who obtains the highest mark in the subject 'Field Excursions VI' in the Bachelor of Applied Science - Applied Geology course.

#### Oil and Colour Chemists' Association, Australia (Queensland Section) Prize

Awarded to a final year student enrolled in a course within the Department of Chemistry who has obtained the best results in Materials Science studies in the final year of Applied Chemistry, covering Materials Science I and II.

#### PESA (Qld) Geology Award

Awarded to the student who obtains the highest results for the third year geology subjects relating to the petroleum industry.

#### Physics Staff Prize

Awarded to the student completing the second year of the multidisciplinary Bachelor of Applied Science course, and undertaking major studies in Physics, who obtains the best academic record for that year.

#### Prospectors Supplies Pty Ltd

Awarded to the first year student of the Bachelor of Applied Science course in Applied Geology who obtains the highest aggregate marks for the year.

#### Queensland Institute of Technology 'Institute' Medal

An Institute Medal may be awarded annually for distinguished academic performance. The basis for selection may be referred to in the Institute Handbook.

#### Queensland Institute of Technology Awards With Distinction

Awards with Distinction may be awarded annually for distinguished academic performance. The basis for selection may be referred to in the Institute Handbook.

### Oscar Queitzsch Memorial Prize

Donated through the Queensland Branch of the Australian Institute of Radiography and awarded to the student in the first year of the Diploma of Applied Science - Diagnostic Radiography course who obtains the best academic record (as determined from awarded grades) for that year.

### Royal Australian Chemical Institute Queensland Branch Prize

Awarded to the student showing, at the first attempt, the greatest proficiency in the second year of the full-time course (or its part-time equivalent) leading either to the Bachelor of Applied Science - Applied Chemistry or to the multidisciplinary Bachelor of Applied Science with major studies in Chemistry.

### Charles O. Schloman Memorial Prize

Awarded annually to the student undertaking the Bachelor of Applied Science (Applied Chemistry) or the chemistry major of the multidisciplinary Bachelor of Applied Science who, in the opinion of the Head of Department, shows at the first attempt, the greatest overall proficiency in the second year Organic Chemistry units of the full-time course (or its part-time equivalent). If no student is considered suitable for the award in a given year, no prize will be awarded.

### Byron Watkins Prize

Awarded annually in honour of Mr Byron Watkins, the foundation Chief Instructor of the Chemistry Department of the former Central Technical College. The award is sponsored by the Industrial and Applied Chemistry Past Students' Association.

The award is made to the graduating student in the Chemistry strand of the Associate Diploma in Applied Science course, who shows the highest level of achievement during the course.

### Owen J Wordsworth Memorial Scholarship

To be eligible for a scholarship the applicant must be accepted as a full-time student in a Masters Degree program at the Queensland Institute of Technology. The basis for selection may be referred to in the Institute Handbook.



**Synopses  
Pre- and Co-requisites**



## SUBJECT SYNOPSES

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### Symbols Used:

- 3 hr/wk Approximate class contact hours each week.  
 ASL225 Course in which subject is offered.
- Pre: A prerequisite unit is one which must be passed before proceeding to a further unit which has the prerequisite so specified. Any waiver of prerequisites must be sought from the Head of the relevant department.
- Co: A corequisite unit is one which, if not previously passed, must be studied concurrently with another unit with which it is a corequisite.
- (R): Where a prerequisite or corequisite unit is designated as a repeat-requisite, the prerequisite or corequisite requirement may be satisfied by the student having attempted the unit although a passing grade is not essential. A student is deemed to have attempted the unit if all assessment requirements have been attempted when registered for the unit. If failed, the repeat-requisite must be repeated at the first opportunity.
- Inc: The subject is incompatible with those listed. Thus, credit may be retained either for the subject or for the incompatible subject, but not for both.
- Pre for: The subject is a prerequisite for another unit.
- A: Offered in Autumn Semester  
 S: Offered in Spring Semester  
 A/S: Offered in either semester  
 Y: Year-long subject

Subjects are arranged alphabetically in code order within Schools & Departments.

## ACCOUNTANCY

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Subject details for further units are contained in the Faculty of Business Handbook.

ACB111 Introductory Accounting  
 6 hr/wk; ASJ226, MAJ133; A

An introduction to accounting information systems. The aims are:

- (a) to develop students knowledge & skills in the procedures of recording, classifying & reporting business transactions.
- (b) to develop students understanding of the Historical Cost model & profit determination under that model.
- (c) to develop students understanding of revenue & expense recognition & the nature of profit.
- (d) to develop students understanding of the nature of internal control procedures through the use of alternative recording systems such as the voucher system, subsidiary ledgers.

- (e) to develop students understanding of the cash basis of accounting as compared to the accrual basis of accounting.
- (f) to develop a basic understanding of cash control procedures & bank reconciliation statements.
- (g) to introduce basic accounting for accounts receivable & bills receivable & payable.
- (h) to introduce basic accounting procedures for inventory, fixed assets, intangibles including goodwill, depreciation & revaluation of non-current assets.

ACB112 Accounting Decisions IA  
3 hr/wk; ASJ226, MAJ133; A/S

An introduction to the accounting & finance & decision-making functions of business organisations. The subject is designed specifically for communication students & covers the role of accounting in society, an introduction to financial statements & assumptions underlying the accounting model. There is further introductory work on company financial reports & their interpretation, the role of legislation, professional bodies & stock exchanges in financial reporting, the management process, planning, control, decision-making, budgets & performance evaluation, control over cash. Alternative forms of business organisation. The Australian Capital Market. Sources & methods of raising finance.

ACB373 Introductory Legal Studies  
3 hr/wk; ASJ226; A/S

Introduction to law, its nature, sources, development & institutions. The law of contract & its impact on business. Various areas of contract, eg sale of goods, agency & employment. Corporations. Restrictive trade practices & consumer affairs.

ACP213 Quality Cost Analysis  
3 hr/wk; IFM242, S

An overview of accounts for reporting purposes. The manufacturing account. Cost objectives, direct material, conversion cost, appraisal cost & cost behaviour. Indirect costs; the investment nature of prevention costs; overhead distribution. Operating costing; job, batch & process costing; costing for recovery of internal failure costs. Corporate plans & budgets, the nature of working capital, budgeting for external failure costs, C/V/P analysis to include levels of failure costs. The variance analysis framework, including quality cost elements & the discovery of profit recovery alternatives in terms of input cost controls. Case study.

## SCIENCE

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ASB101 Study Support Skills  
1 hr/wk; ASJ226, CHJ129, ESJ132; A

A series of workshops run by the Library & the Counselling Centre to assist students to utilise optimally time & resources in their academic program. Topics include library resources & their use, note taking, effective reading & assignment writing skills, revision & examination techniques, time management.

ASB200 Introductory Meteorology  
3 hr/wk; ASJ226; S

Historical introduction, the earth's atmosphere, heat transfer processes, the gas laws, the physics of water vapour, wind theory, atmospheric stability & instability, precipitation, atmospheric electricity, meteorological observation, synoptic meteorology, atmospheric optics.

ASB300 Industrial Experience I

ASB400 Industrial Experience II

ASJ226; A/S; Pre: Completion of the equivalent of the first & second years of the standard full-time course, normally with a WGA of 4.5 overall.

The aims of these two subjects are to:

- (a) educate students within the context of commerce, industry, or government;
- (b) enable students to complete their final year of study with a clearer understanding of their chosen field.

Students undertaking the Cooperative Education option in the BAppSc (ASJ226) course will be placed with an approved employer for 10-12 months paid full-time employment.

An academic supervisor will be appointed to liaise with the student and the industrial supervisor during the employment period, and to facilitate the student's transition back to study.

The student will be required to complete a report on their industrial experience. The student's results will be determined on the basis of their report, the academic supervisor's report and the employer's report.

ASB310 Industrial Experience I

ASB410 Industrial Experience II

CHJ129; A/S; Pre: Completion of the equivalent of the first & second years of the standard full-time course, normally with a WGA of 4.5 overall.

The aims of these two subjects are to:

- (a) educate students within the context of commerce, industry, or government;
- (b) enable students to complete their final year of study with a clearer understanding of their chosen field.

Students undertaking the Cooperative Education option in the BAppSc (CHJ129) course will be placed with an approved employer for 10-12 months paid full-time employment.

An academic supervisor will be appointed to liaise with the student and the industrial supervisor during the employment period, and to facilitate the student's transition back to study.

The student will be required to complete a report on their industrial experience. The student's results will be determined on the basis of their report, the academic supervisor's report and the employer's report.

ASB320 Industrial Experience I

ASB420 Industrial Experience II

ESJ132; A/S; Pre: Completion of the equivalent of the first & second years of the standard full-time course, normally with a WGA of 4.5 overall.

The aims of these two subjects are to:

- (a) educate students within the context of commerce, industry, or government;
- (b) enable students to complete their final year of study with a clearer understanding of their chosen field.

Students undertaking the Cooperative Education option in the BAppSc (ESJ132) course will be placed with an approved employer for 10-12 months paid full-time employment.

An academic supervisor will be appointed to liaise with the student and the industrial supervisor during the employment period, and to facilitate the student's transition back to study.

The student will be required to complete a report on their industrial experience. The student's results will be determined on the basis of their report, the academic supervisor's report and the employer's report.

ASB330 Industrial Experience I

ASB430 Industrial Experience II

MAJ133; A/S; Pre: Completion of the equivalent of the first & second years of the standard full-time course, normally with a WGA of 4.5 overall.

The aims of these two subjects are to:

- (a) educate students within the context of commerce, industry, or government;
- (b) enable students to complete their final year of study with a clearer understanding of their chosen field.

Students undertaking the Cooperative Education option in the BAppSc (MAJ133) course will be placed with an approved employer for 10-12 months paid full-time employment.

An academic supervisor will be appointed to liaise with the student and the industrial supervisor during the employment period, and to facilitate the student's transition back to study.

The student will be required to complete a report on their industrial experience. The student's results will be determined on the basis of their report, the academic supervisor's report and the employer's report.

**BIOLOGY**

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**BEA004 Taxonomy**  
3 hr/wk; ASL225, A

Investigation & identification of local flora & fauna; use & construction of keys. The concepts of systematics, classification taxonomy & nomenclatural procedure will be introduced in short lectures & tutorials associated with the practical exercises.

**BEA011 Animal Physiology**  
3 hr/wk; ASL225; S

This unit introduces the general physiological processes which sustain life & develops an understanding of animal-environment interactions.

**BEA016 Aquaculture Techniques**  
3 hr/wk; ASL225; A

Topics covered will include: water quality monitoring; culture methods for microscopic food organisms; disease & parasite identification & treatment; & a variety of techniques associated with spawning, rearing, handling & stock assessment.

**BEA021 Plant Physiology**  
3 hr/wk; ASL225; A

An introduction to the important aspects of whole-plant physiology, including nutrition, water relations, photosynthesis, translocation & stress physiology.

**BEA026 Plant Cell & Tissue Culture**  
3 hr/wk; ASL225; S

Topics covered will include techniques, equipment & media used in plant tissue culture, the role of plant growth regulators & micropropagation. The significance of organogenesis, somatic embryogenesis & genetic variability in plant tissue culture will be discussed.

The lecture program will be supported by appropriate laboratory exercises.

**BEA060 Hydrobiological Techniques**  
3 hr/wk; ASL225; A

An introduction to the characteristics of aquatic ecosystems. Students will gain practical experience using methods, equipment & instrumentation to: estimate population abundance, distribution, biomass & productivity; determine community structure & diversity; determine physical characteristics & morphology & assess water quality. Compulsory field studies form a significant part of this unit.

BEA090 External Projects I  
3 hr/wk; ASL225; A/S

BEA099 External Projects II  
3 hr/wk; ASL225; A/S

These two elective subjects will be offered on occasions to enable students to submit studies carried out as part of their normal employment for credit in the course. Design & assessment of the experimental work program will be carried out by the employer in conjunction with a supervisor appointed by the Head of Department.

BEA108 Introductory Biology  
3 hr/wk; ASL225; A

An introduction to systematics & classification. Examination of the morphology, anatomy, reproduction, life-history & where appropriate, behaviour of selected organisms.

BEA198 Microscopy Techniques  
3 hr/wk; ASL225; A/S

This unit will include: the use & roles of various types of optical microscopes; microscope accessories for counting, measuring, drawing & photography; procedures for preparing specimens for examination & histological/histochemical study.

BEA200 Biology B  
3 hr/wk; ASL225; S

This unit extends the basic concepts presented in Introductory Biology & will also include aspects of mendelian genetics, gene expression & cell differentiation, as well as reproduction & development in selected animals & plants.

BEA202 Cell Structure & Function  
3 hr/wk; ASL225; A/S

A general course in cell biology including the living cell & its processes, structure & function. Photosynthesis, respiration, intermediate metabolism will be emphasised. Elementary molecular genetics will be outlined.

BEA296 Data Presentation Techniques  
3 hr/wk; ASL225; S

Audio visual aids: care, use & maintenance of projectors, film repair, preparation of transparencies, video systems, tape recorder use, tape & film splicing. Basic draughting techniques, lettering & use of a copying table.

BEA297 Biological Data Handling  
3 hr/wk; ASL225; A/S; Pre: MAA251

Application of statistical procedures to vegetation surveys, including point & area sampling; design of experiments involving live organisms; recognition of problems arising from variability in results & particular data type. Methods of data collection, checking, analysis & presentation are discussed, including some sophisticated multivariate analyses.

BEA305 Environmental Biology  
3 hr/wk; ASL225; A; Inc: BEA405

Tolerance, survival. Radiation budgets, temperature control. Biorhythms, navigation & migrations. Ecosystems & energy flow. Productivity, decomposition & nutrient cycling. Niche, species packing, diversity, colonisation & community structure. Short field trips form an integral part of the unit.

BEA339 Introduction to Bioculture  
3 hr/wk; ASL225; A

The subject will introduce students to techniques of algal culture & in vitro plant tissue culture. Topics will include, nutrition, continuous production techniques & the use of growth regulators to control growth. The role of environmental factors in controlling growth will also be discussed.

This subject will provide the theoretical basis for students undertaking electives in aquaculture techniques &/or plant tissue culture.

BEA349 Computer Applications in Biology  
3 hr/wk; ASL225; A

An introduction to microcomputers & applications-software such as wordprocessing, data bases, spreadsheets, statistical packages & computer graphics for report presentation. This subject will not be oriented towards any specific computer language.

BEA398 Animal & Plant Techniques  
6 hr/wk; ASL225; S

Care & maintenance of animal & plant resources, both micro- & macroscopic. Animal handling, maintenance of glasshouse resources, culture collections & sterile techniques, preparation of specimens for permanent collections & the maintenance of such collections.

BEA399 Applications in Electron Microscopy  
3 hr/wk; ASL225; A

This subject deals with the roles played by various forms of electron microscopy in the biological sciences & presents an introduction to the basic techniques & their limitations.

BEA405 Population Biology  
4 hr/wk; ASL225; S; Co: BEA498; Inc: BEA305

A general course in population biology including: structure & dynamics of populations, evolution & differentiation in populations; the relationships between the genetics, energetics & dynamics of populations leading to particular life-history strategies will be emphasised. An extended field excursion is a compulsory part of the subject.

BEA498 Field Techniques  
6 hr/wk; ASL225; S; Co: BEA405

Activities include surveying, interpretation of aerial photographs, soil & climatic measurements, assessment of vertebrate populations, collection of insect & plant specimens,

evaluation of spatial changes in plant & animal communities in relation to environmental gradients. Skills are gained not only in sampling & analytical techniques, but also in the establishment & running of a field camp. An extended field excursion is a compulsory part of the subject.

#### BEB103 Biology IA

3 hr/wk; ASJ226; A; Co: BEB149 unless Senior Biology has been undertaken; Pre for: BEB303, BEB321, BEB366, BEB388, BEB429, BEB411, BEB435, BEB563

A course of lectures & tutorials dealing with fundamental biological principles & phenomena. Content will include nutrient procurement, transport systems & mechanisms, energy transformations, population & community biology, reproduction & basic genetics.

#### BEB104 Biology IB

3 hr/wk; ASJ226; A; Co: BEB149 unless Senior Biology has been undertaken

A program of practical work presenting aspects of applied biology, plant & animal physiology & basic genetics including bacterial transformation.

#### BEB149 Introductory Biology

3 hr/wk; ASJ226; A; Inc: Senior Biology; Pre for: BEB103, BEB104, BEB201, BEB207

This is a companion subject to BEB103 & BEB104 designed for students who have not studied Senior Biology. It presents an overview of organisms with emphasis on the relationship between structure & basic biological function, including nutrition, excretion, reproduction & inheritance. The subject will satisfy the requirements of students who seek a general introduction to biology.

#### BEB201 Cell Biology

3 hr/wk; ASJ226; S; Pre: BEB149 or Senior Biology; Pre for: BEB435

A program of lectures & tutorials chiefly concerned with the molecular biology of eucaryotic cells, their structure, function, systems, metabolism & differentiation. The molecular basis for genetic manipulation & other current advances based in molecular genetics will be introduced.

#### BEB207 Biological Systems

3 hr/wk; ASJ226; S; Pre: BEB149 or Senior Biology; Pre for: BEB357

This unit introduces general systems theory as a unifying concept in biology & its application to the study of simple biological systems. Emphasis will be placed on modelling techniques & a sub-unit in BASIC programming will provide students with an introduction to computer simulation of simple systems.

**BEB303 Biology II**

6 hr/wk; ASJ226; S; Pre: BEB103; Pre for: BEB560

Comprises a study of plant form, function & classification with examples drawn from major plant & animal taxa.

**BEB321 Plant Physiology**

4 hr/wk; ASJ226; A; Pre: BEB103; Pre for: BEB423

This unit develops an understanding of the functional systems of plants & provides an introduction to environmental physiology and plant tissue culture.

**BEB357 Population & Systems Ecology**

3 hr/wk; ASJ226; A; Pre: BEB207; Co: BEB358; Pre for: BEB390, BEB444, BEB500, BEB560, BEB653

Topics to be covered include theoretical models dealing with natural regulation of population size, their limitations & applicability. Population processes & density-dependent feedback; life-history strategies. Energy flow models & dynamics, incorporating productivity & decomposition. There will be field excursions which will integrate environmental features with population processes.

**BEB358 Experimental Design**

3 hr/wk; ASJ226; A; Co: BEB357; Pre for: BEB444

This subject is offered in two sections. The first section of 10 lecture-tutorials involves multiple & curvilinear regression,  $\chi^2$  goodness of fit, multiway analysis of variance, multiple range tests. The second section builds a practical extension on the theoretical basis of statistics, using experimental situations commonly met within biology.

**BEB366 Biology & Soils**

3 hr/wk; ASJ226; A; Pre: BEB103

The subject is an important basis for studies in both aquaculture & terrestrial ecology. Attention is given to the characteristics of soils, soil classification, & the factors (parent material, climate, topography and biota) which determine soil development. The structure & productivity of plant & animal communities, & the distribution of species will be shown to be dependent on biogeochemical pathways, regulated by the soil, & on other conditions influenced by the substrate (including water quality). Consideration will be given to the distribution of major soil types in relation to effective management of terrestrial & aquatic biota.

**BEB388 Aquaculture**

3 hr/wk; ASJ226; A; Pre: BEB103

This unit consists largely of practical work & places emphasis on methods & techniques associated with the commercial production of aquatic species. Topics covered include: monitoring & managing water quality; control of maturation & spawning; methods for nursing & rearing larvae & fry; food organism production & feeding; diagnosis & treatment of health problems.

**BEB390 Field Studies I**  
3 hr/wk; ASJ226; S; Pre: BEB357

A series of weekend or extended field trips with an aggregate of 40 hours intensive field work in applied biology.

**BEB403 Biology III**  
4 hr/wk; ASJ226; S; Pre: MSB473

This subject stresses functional systems of plants & animals in natural & contrived ecosystems. Emphasis will be placed on manipulations of those plant & animal species of economic importance.

**BEB411 Animal Physiology**  
4 hr/wk; ASJ226; S; Pre: BEB103

The subject provides & develops an understanding of the functional systems of animals & provides an introduction to environmental physiology.

**BEB423 Plant Tissue Culture**  
3 hr/wk; ASJ226; S; Pre: BEB321; Pre for: BEB663

This subject introduces students to the techniques & physiological basis of plant tissue culture. Topics covered include: culture media, organogenesis, somatic embryogenesis & micropropagation. Students will be introduced to a range of techniques used in research & commercial laboratories.

**BEB429 Vegetation Studies**  
3 hr/wk; ASJ226; S; Pre: BEB103

This unit introduces many of the techniques used in vegetation mapping. Basic topics covered include: vegetation classification, floristics, sampling techniques, field surveying techniques & aerial photo-interpretation. There are several compulsory field excursions.

**BEB435 Introductory Genetics**  
3 hr/wk; ASJ226; S; Pre: BEB103 + BEB201; Pre for: BEB435

This unit is an introductory subject in basic genetics. Topics covered include: reproduction & the genetic code, the molecular basis to genetics & Mendelian genetics. Genotype-phenotype interactions & quantitative genetics. The genetics of prokaryote & simple eukaryote organisms. Evolution & natural selection.

**BEB444 Population Analysis**  
3 hr/wk; ASJ226; S; Pre: BEB357 + BEB358

General principles of population analysis relating to conservation, central & harvesting.

Specific techniques for investigating population processes. Concepts for carrying capacity & sustained yield harvesting in relation to population processes & population management, their limitations & relevance in the Australian environment. Intensive animal enterprises. Principles of analysis for wild-life & feral pest management emphasising Australian problems.

Analysis of weed colonisation & their control. Fisheries population analysis. Use of modelling & simulation in population analysis & management. A rigorous individual study of two management problems from the above parallels field trips to agencies responsible for population analysis for management in Queensland.

**BEB447 Environmental Monitoring**  
3 hr/wk; ASJ226; A

A course in the skills of environmental assessment, surveying & mapping ecosystems. Approaches to & methods of assessment. The lecture course will be supported by field work in several environments & using a wide range of instrumentation to delineate environmental profiles.

**BEB490 Field Studies II**  
3 hr/wk; ASJ226; A

A series of weekend or extended field trips with an aggregate of 40 hours intensive field work in applied biology.

**BEB500 Selected Topics I**  
3 hr/wk; ASJ226; A; Pre: BEB357

Students will complete a study on a specific topic. Such study will involve selected reference material & may also include a lecture program or project work.

**BEB535 Population Genetics**  
3 hr/wk; ASJ226; A; Pre: BEB435

This unit is an extension of BEB435 Introductory Genetics & examines in detail the genetics of populations. Topics covered include: the genetic structure of populations & processes of evolutionary change; natural selection, inbreeding & coadaptation; species & speciation theory; ecological genetics & the genetics of behaviour. Students may be required to undertake semester-long project topics on relevant practical or theoretical problems.

**BEB560 Projects I**  
6 hr/wk; ASJ226; A; Pre: BEB303 & BEB357; Pre for: BEB660

This unit develops a student's capacity for managing his or her own work & for persistence within a circumscribed subject area. Projects emphasise specific investigatory skills or ability at reviewing, collating, interpreting & presenting data. A contribution to a seminar is usually required. Projects are supervised by various staff members & are graded individually. The Head of Department coordinates assessment of the unit & may request external assessment. Projects are to be selected by the 12th week of the fourth semester of the course. There are a number of compulsory field trips. This unit normally leads into BEB660 Projects II with assessment completed at the end of Spring semester.

**BEB563 Biological Resources**  
4 hr/wk; ASJ226; S; Pre: BEB103

This unit provides a conceptual basis for aspects of ecosystem management related to naturally occurring materials & ecosystems subject to interactive use within the economy. Limitations on specific exploitation of natural resources are identified & linked with relevant aspects of land tenure, administration & law. Strategies leading to sustained yield & conservation are contrasted with those resulting in resource degradation.

**BEB600 Selected Topics in Biology II**  
3 hr/wk; ASJ226; S

As a final semester subject, selected topics provides students with an opportunity to complete a detailed study on a specific topic. The study will normally be based on project work & may include a lecture program.

**BEB653 Population Management**  
4 hr/wk; ASJ226; S; Pre: BEB357

The principles of population management will be illustrated from examples of economically important plant & animal populations (including pest populations). These will be discussed & interpreted in terms of the ecosystem that supports them. Various alternative management methods for sustained yield, production or conservation will be emphasised. Examples of habitat manipulation as a strategy preferable to the direct manipulation of numbers & the criteria for successful biological control programs will be examined. The unit will also introduce the economic, sociological & legal implications of management programs.

**BEB655 Case Studies in Population Management**  
5 hr/wk; ASJ226; S; Co: BEB653

An extension of BEB653 Population Management, this subject will allow for the detailed study of populations of economic importance. Management strategies for both terrestrial & aquatic populations will be presented. Topics will cover the range of possible population manipulations including population stimulation, sustained yield & reduction.

Major field trips will allow students to undertake studies on important systems.

**BEB660 Projects II**  
6 hr/wk; ASJ226; S; Pre: BEB560

This unit is an elective which may be undertaken by students who have taken BEB560 Projects I & who have the permission of the Head of Department to continue project work.

The student either:

- (a) continues a project undertaken in BEB560, or
- (b) involves one or more additional projects aimed at developing to a greater depth aspects of the subject matter of experimental subjects previously completed, such projects being established for either individuals or groups. Assessment is conducted as for BEB560.

Individual programs for BEB660 are to be determined by the 12th week of the fifth semester of the course. There are a number of excursions.

**BEB663 Bioculture**  
5 hr/wk; ASJ226; A; Pre: BEB423

Bioculture will provide students with more advanced training in selected techniques. Emphasis will be placed on providing sufficient information & technical expertise to allow graduates to enter commercial, industrial or research employment.

**BED107 Cellular Effects of Radiation**  
1 hr/wk; PHK205, PHK206; A

The chemical nature of cell materials, cell organelles, the cell cycle, effects of radiation on proteins, nucleic acids & CNA. Radiation induced chromosomal aberrations, gene or point mutations, damage to cell membranes; cell killing, simple survival curves, mammalian cell survival curves, target theory, radiosensitivity of the different phases of the cell cycle, synchronised cell populations, repair.

## CHEMISTRY

**CHA111 Laboratory Techniques**  
3 hr/wk; ASL225; A/S; Pre for: CHA218, CHA219, CHA240

A course introducing the student to safe & proficient procedures in the laboratory, & giving practice in the manipulation of common elementary laboratory apparatus, equipment & reagents. On completing the course the student should be able to handle, correctly & safely, all the basic pieces of laboratory equipment & be familiar with their main functions & limitations. Accuracy, cleanliness & safety will be stressed in all topics.

**CHA112 Workshop Practice**  
1.5 hr/wk; ASL225; A/S

A course of practical work in elementary workshop skills, including familiarisation with basic tools & their use in maintenance & repair of laboratory equipment. Experience in soldering, brazing, glass-working & plastic work will be provided. Safety in the workshop will be emphasised.

**CHA145 Introductory Chemistry**  
4 hr/wk; ASL225; A; Pre for: CHA230, CHA250, CHA270;

An integrated course of fundamental chemistry covering: the nature of chemistry, atomic molecular & nuclear structure, bonding & types of bonds; the structure & nature of matter; molecular formulae, atomic & molecular weights; the periodic classification; reduction/oxidation; chemical equilibria; liquids & solutions & simple phase equilibria; equilibria in electrolyte solutions; pH & its measurement. Carbon chemistry & functional groups. The chemistry & properties of some common laboratory chemicals. Practical applications are emphasised.

**CHA218 Analytical Chemistry I**

3 hr/wk; ASL225; A/S; Pre: CHA111; Pre for: CHA318, CHA319, CHA580

This is a lecture & laboratory program covering fundamental theory & techniques of titrimetric & gravimetric analysis.

**CHA219 Qualitative Analysis**

3 hr/wk; ASL225; S; Pre: CHA111; Pre for: CHA319

This course considers the behaviour of a range of common cations & anions towards common laboratory reagents. These reactions form the basis of procedures for the separation & identification of these cations & anions. Qualitative testing for elements in organic molecules together with test procedures for qualitative identification of functional groups in organic molecules will also be covered.

**CHA230 Chemistry of Inorganic Materials**

2 hr/wk; ASL225; A/S; Pre: CHA145

A course covering the occurrence, extraction/manufacture, properties & uses of the elements & the important inorganic compounds derived from a selection of members of the chemical groups.

**CHA240 Instrumental Techniques**

3.5 hr/wk; ASL225; S; Pre: CHA111; Co: CHA218 or (CHA111 & PHA154) & PHA258; Pre for: CHA318, CHA580

An overview of the principles & practice of modern instrumental analysis, including the nature of electromagnetic radiation & its interaction with matter; use of visible, UV & IR spectroscopy; emission & absorption phenomena; chromatographic techniques & electroanalytical chemistry.

**CHA250 Organic Chemistry I**

3.5 hr/wk; ASL225; A/S; Pre: CHA145; Pre for: CHA350, CHA368, CHA580

This subject provides an introduction to functional group chemistry including hydrocarbons, aromatic compounds, organic halides, alcohols, phenols & ethers & also an introduction to the use of infrared spectroscopy to indicate the presence of particular functional groups.

**CHA270 Physical Chemistry I**

3.5 hr/wk; ASL225; A/S; Pre: CHA145; Pre for: CHA320, CHA370

This subject forms the first part of an integrated syllabus of physical chemistry in the Associate Diploma & is a study of the fundamental aspects of chemical energetics, solution chemistry & equilibria & practical applications thereof.

**CHA318 Instrumental Analytical Chemistry**

4 hr/wk; ASL225; A; Pre: CHA218 + CHA240; Co: CHA319; Pre for: CHA610

A course of lectures & practical work introducing the principles & practices of mass spectrometry, fluorescence spectroscopy & ICP together with further development of selected topics from the unit CHA240.

**CHA319 Analytical Chemistry II**

3 hr/wk; ASL225; A; Pre: CHA218 & CHA219; Pre for: CHA610

A course of lectures & practical work designed to develop further the basic titrimetric & gravimetric analysis principles introduced in the unit CHA218. The practical program will feature the analysis of commercial materials with emphasis on sample dissolution techniques.

**CHA320 Chemical Process Principles I**

3 hr/wk; ASL225; A; Pre: CHA270; Co: CHA370; Pre for: CHA368, CHA520

Material covered in this course discusses chemical reactors (both homogeneous & heterogeneous), unit operations (transport & preparation of materials & separation of materials) & material & energy balances in chemical processes.

**CHA350 Organic Chemistry II**

3 hr/wk; ASL225; A/S; Pre: CHA250; Pre for: CHA550, CHA580

This subject continues the study of functional groups & includes carbonyl compounds, carboxylic acids & their derivatives, organic nitrogen compounds, including heterocycles, as well as selected polyfunctional compounds such as triglycerides, amino acids & proteins. Further uses of infrared spectroscopy are discussed.

**CHA368 Industrial Chemistry**

4 hr/wk; ASL225; S; Pre: CHA250 & CHA320

This subject aims to develop in the student an appreciation of the basic aspects of product & quality control, an understanding of the underlying fundamental chemistry & an overall concept of the chemical technology involved in, for example, the petroleum & petrochemical industry, the polymer, plastic & adhesive industries, the paint industry, the textile industry, the sugar industry, water treatment plants, the glass & ceramics industry, & the cement industry.

Field trips are an integral part of this subject.

**CHA370 Physical Chemistry II**

2 hr/wk; ASL225; A; Pre: CHA270; Pre for: CHA670

This subject forms the second part of the integrated syllabus of physical chemistry of the Associate Diploma & covers the areas of chemical kinetics, surface chemistry & elementary electrochemistry.

CHA410 Computers in Chemistry  
3 hr/wk; ASL225; S; Pre: CSA259

This course will outline the use of computers in various aspects of the chemical industry - both in laboratory & plant. The different approaches to laboratory automation will be discussed & a detailed study of computer control in a selected industry will be included. Field trips are included in this subject.

CHA442 Introduction to Occupational Safety  
2 hr/wk; ASL225; A; Inc: CHA440

Basic first aid relevant to laboratory, plant & field situations; principles & practice of safe handling of common laboratory chemicals, safety aspects of laboratory design.

CHA520 Chemical Process Principles II  
3 hr/wk; ASL225; A; Pre: CHA320

This is a lecture & laboratory course which deals with measurement systems, the principles of process control & the applications of process control in the chemical industry.

CHA550 Organic Chemistry III  
3 hr/wk; ASL225; S; Pre: CHA350

This subject aims to give students an appreciation of the chemistry & uses of organic compounds encountered in industry, such as agricultural chemicals, fats & oils, waxes, detergents, dyes, drugs, elastomers, fibres, adhesives & cellulose derivatives.

CHA580 Food Chemistry I  
3 hr/wk; ASL225; A; Pre: CHA240 + CHA250 + CHA218; Co: CHA350;  
Pre for: CHA680

Topics covered include the basic chemical components of food, fats & oils, proteins, carbohydrates, vitamins & minerals & factors affecting quality such as texture, flavour & colour. Measurements of food quality. A major assignment related to the dairy industry is incorporated.

CHA610 Industrial Analysis  
3 hr/wk; ASL225; S; Pre: CHA318 & CHA319

A course involving the use of both qualitative (semi-micro) & quantitative techniques in the analysis of commercially important materials, including ores, cement, fertilizer, fats & oils & sugar products.

CHA670 Physical Chemistry III  
3 hr/wk; ASL225; S; Pre: CHA370

This subject forms the third part of the integrated syllabus of physical chemistry of the Associate Diploma & covers the areas of applied electrochemistry, corrosion, distillation & extraction. Practical applications are emphasised.

CHA680 Food Chemistry II  
3 hr/wk; ASL225; S; Pre: CHA580

A more advanced unit covering the chemistry & principal methods of food processing & preparation. A further major assignment appropriate to the dairy industry is incorporated.

CHB001 Introductory Chemistry  
3 hr/wk; ASJ226; A; Inc: Senior Chemistry; Pre for: CHB101, CHB102

Scientific measurement, atomic structure, periodic table, chemical equations, stoichiometry & calculations, chemical bonding, chemical reactivity, acids & bases, redox systems, properties of matter, chemical thermodynamics, enthalpy, heat of reactions, organic chemistry.

CHB101 Chemistry IA  
3 hr/wk; ASJ226, ESJ132; A; Co: CHB001 unless Senior Chemistry has been undertaken; Inc: CHB150, CHB180; Pre for: CHB201, CHB310, CHB327, CHB340, CHB343, CHB351, CHB371, CHB411, CHB427

A series of lectures & tutorials introducing the important concepts in chemistry. Topics include principles of physical chemistry, chemical bonding & molecular geometry & an introduction to the chemistry of carbon compounds.

CHB102 Chemistry IB  
3 hr/wk; ASJ226, ESJ132; A/S; Co: CHB101 (+ CHB001 unless Senior Chemistry has been undertaken); Inc: as for CHB101; Pre for: CHB202, CHB310, CHB327, CHB340, CHB343, CHB351, CHB371, CHB411, CHB427

A course in practical chemistry covering the experimental aspects of analytical chemistry, physical chemistry & organic chemistry. This is primarily an experimental program supported by appropriate lectures.

CHB110 Analytical Chemistry I  
3 hr/wk; CHJ129; A; Pre for: CHB210, CHB310, CHB340

Introduction to analytical chemistry. Examples of acid base titrations, reduction-oxidation titrations & precipitation titrations are used to develop the theory & practice of volumetric analysis. Gravimetric analysis is introduced & both precipitometric & evolution methods are discussed. A coverage of methods available for handling experimental results is given, including absolute & relative precision & accuracy, deviations, rejection of results, significant figures, sources of error & means by which they may be minimised.

CHB150 Organic Chemistry I  
4 hr/wk; CHJ129; A/S; Pre for: CHB250, CHB350, MSB473; Inc: CHB101 or CHB102

An introduction to the principles of organic chemistry. Topics include: principles of bonding & their effect on organic structure; nomenclature; influence of acidity, polarity & structure on reactivity; the major reaction types; properties of hydrocarbons & alkyl halides.

**CHB180 Physical & Inorganic Chemistry I**

5 hr/wk; CHJ129; A; Pre for: CHB230, CHB270, CHB327, CHB370, CHB340, CHB427; Inc: CHB101 or CHB102

The structure & bonding of atoms & molecules; elementary thermodynamics including the First Law & Thermochemistry; the states of matter & the gas laws; homogeneous, heterogeneous & ionic equilibria; elementary kinetics & experimental methods. Principles of non-redox & redox ionic reactions involving oxygen compounds; Periodic Table & periodicity; chemistry of simple acids, bases & salts; chemistry of hydrogen & hydrides; applications.

**CHB201 Chemistry IIA**

3 hr/wk; ASJ226, ESJ132; S; Pre: CHB101; Inc: CHB230 or CHB250 or CHB270; Pre for: MSB415, CHB310, CHB340, CHB371, CHB411, CHB430, CHB440, CHB471

A series of lectures & tutorials continuing the study of the principles of chemistry covered in CHB101.

**CHB202 Chemistry IIB**

3 hr/wk; ASJ226, ESJ132; S; Pre: CHB102; Co: CHB201; Inc: as for CHB201; Pre for: MSB415, CHB310, CHB351, CHB411, CHB430, CHB440

A course in practical chemistry covering experimental aspects of inorganic, physical & organic chemistry that expands on the techniques covered in CHB102.

**CHB210 Analytical Chemistry II**

2 hr/wk; CHJ129; S; Pre: CHB110; Pre for: CHB310, CHB440

Volumetric & gravimetric techniques introduced in the unit CHB110 are applied to more complex samples. Complexometric & back titration techniques are introduced. Qualitative organic analysis is discussed with reference to separation methods based on functional groups & solubility. Simple colorimetric methods are used as an introduction to instrumental analysis.

**CHB230 Inorganic Chemistry II**

3 hr/wk; CHJ129; A/S; Pre: CHB180; Pre for: CHB430; Inc: CHB201 or CHB202

A course of lectures & practical work in the area of general applied inorganic chemistry encompassing the topics of the chemistry of the non-metals & anions; the chemistry of main group & transition metals; basic coordination chemistry.

**CHB250 Organic Chemistry II**

4 hr/wk; CHJ129; A/S; Pre: CHB150; Pre for: CHB350, CHB450, MSB473, CHB440; Inc: CHB201 or CHB202

Alkenes & alkynes - electrophilic & free radical addition. Benzene - aromatic character, electrophilic substitution. Alcohols, phenols & ethers - nucleophilic reactions, oxidation. Aldehydes & ketones - addition reactions, oxidation & reduction, active hydrogen reactions, synthesis from Grignard reagents. Simple spectroscopic properties (infrared & ultraviolet) of the above classes.

**CHB270 Physical Chemistry II**

4 hr/wk; CHJ129; S; Pre: CHB180; Pre for: CHB310, CHB370, CHB440, CHB470; Inc: CHB201 or CHB202

The Second Law of Thermodynamics; introductory surface chemistry & electrochemistry; the properties of liquids & solutions & the phase chemistry of one component systems; molecular bonding & introductory spectroscopy.

**CHB310 Analytical Chemistry III**

4 hr/wk; ASJ226, CHJ129; A/S; Pre: (CHB101 & CHB102) or (CHB201 & CHB202) or (CHB110 & CHB210 & CHB270); Pre for: CHB510

Calculation of titration curves for redox, precipitometric & complexometric titrations, conditional stability constants, masking & demasking phenomena, organic analytical reagents, gravimetric theory, methods & theory of sampling, errors, sample dissolution, electrodeposition, potentiometric methods, ion selective electrodes, coulometry, polarography.

**CHB327 Chemical Technology III**

3 hr/wk; ASJ226, CHJ129; A; Pre: (CHB180 & PHB260) or (CHB101 & CHB102 & PHB110 & PHB111); Pre for: CHB527, CHB627

Introduction to chemical process industries. Economic significance. Flowsheets. Unit operations: basic concepts, a study of range of unit operations selected from: communiton, classification, leaching, solid-fluid separations, drying, fluid transport, agitation, liquid-liquid extraction, heat exchange, evaporation, distillation, gas absorption.

**CHB340 Spectroscopy**

3 hr/wk; ASJ226, CHJ129; A/S; Pre: CHB180 or CHB110 or (CHB101 & CHB102 & CHB201); Pre for: CHB510, CHB641

The theory of rotational, vibrational & electronic spectroscopy. Instrumentation & spectroscopic methods of analysis.

**CHB343 Chemistry for Geologists III**

4 hr/wk; ESJ132; A; Pre: CHB101 & CHB102

A course in the theory & practice of instrumental & other methods of rock & mineral analysis.

**CHB350 Organic Chemistry III**

5 hr/wk; CHJ129; A/S; Pre: CHB150 & CHB250; Pre for: CHB450, CHB550, MSB474; Inc: CHB351

This unit continues the study of organic functional groups & extends the students' knowledge to include simple molecules of biological significance. A study of the stereochemical aspects of organic chemistry is included along with a more detailed examination of spectroscopic properties, including ultra-violet, infrared & nuclear magnetic resonance spectroscopy.

**CHB351 Organic Chemistry IIIC**

5 hr/wk; ASJ226; A; Pre: CHB101 & CHB102 & CHB202; Pre for: CHB451, CHB510; Inc: CHB350

This unit continues the study of organic functional groups & extends the students' knowledge of the mechanisms of simple organic & biochemical processes. A study of organic spectroscopy is also involved & includes ultraviolet, infrared & nuclear magnetic resonance spectroscopy.

**CHB370 Physical Chemistry III**

5 hr/wk; CHJ129; A; Pre: CHB180 & CHB270; Pre for: CHB470, CHB570, CHB590; Inc: CHB371

Experimental, theoretical & applied reaction kinetics; thermodynamics; real fluids; gas absorption & heterogeneous catalysis; phase equilibria.

**CHB371 Physical Chemistry IIIC**

4 hr/wk; ASJ226; A; Pre: CHB101 & CHB102 & CHB201; Pre for: CHB471, CHB571, CHB590; Inc: CHB370

Experimental, theoretical & applied reaction kinetics; thermodynamics; real fluids; gas adsorption & heterogeneous catalysis; phase equilibria.

**CHB411 Environmental Analytical Chemistry**

4 hr/wk; ASJ226; Pre: CHB101 & CHB102 & CHB201 & CHB202; Inc: major in Chemistry

A course of lectures & practical work for students of biological sciences dealing with the principles & application of sampling, electrometric methods, spectroscopic methods, flame methods & separation methods to the analysis of materials from the biosphere.

**CHB427 Chemical Technology IV**

4 hr/wk; ASJ226, CHJ129; S; Pre: CHB180 or (CHB101 & CHB102); Pre for: CHB527, CHB627

Numerical, graphical & computer aids to problem solving. Chemical process principles. Industrial stoichiometry, material balances for solids, liquids, gases & vapours. Energy balances. Combined material & energy balances. Balances on reactive processes.

**CHB430 Inorganic Chemistry IV**

3 hr/wk; ASJ226, CHJ129; A/S; Pre: CHB230 or (CHB201 & CHB202); Pre for: CHB530

A course of lectures & practical work relating to the topics of crystal field theory, solution chemistry of metal complexes, principles of bio-inorganic chemistry & the chemistry of post-transition elements.

**CHB440 Separation Methods**

3 hr/wk; ASJ226; S; Pre: (CHB210 & CHB250 & CHB270) or (CHB201 & CHB202); Pre for: CHB510

Basic principles & applications of solvent extraction.

Principles & practices of chromatography with reference to column chromatography, ion exchange chromatography, molecular sieves, gel permeation chromatography, thin layer chromatography, paper chromatography.

Gas chromatography with particular reference to theory, instrumentation & applications including column selection, efficiency, detectors, resolution & temperature programming. Liquid chromatography with particular reference to instrumentation, columns, detector systems & applications.

**CHB450 Organic Chemistry IV**

4 hr/wk; CHJ129; A/S; Pre: CHB250 & CHB350; Pre for: CHB550, CHB640; Inc: CHB451

A study of the reactions & properties of polyfunctional organic compounds as well as heterocyclic compounds particularly naturally occurring & technically useful compounds. Rearrangement reactions & the chemistry of organometallic compounds will also be studied.

**CHB451 Organic Chemistry IVC**

3 hr/wk; ASJ226; S; Pre: CHB351; Pre for: CHB551; Inc: CHB450

A study of the reactions & properties of polyfunctional organic compounds as well as heterocyclic compounds, particularly naturally occurring & technically useful compounds. Rearrangement reactions & the chemistry of organometallic compounds will also be studied.

**CHB470 Physical Chemistry IV**

4 hr/wk; CHJ129; A/S; Pre: CHB270 & CHB370; Pre for: CHB527, CHB570, CHB590, CHB640; Inc: CHB471

Application of thermodynamics to phase transition & equilibria. Polymerisation processes. Homogeneous & heterogeneous catalysis. Introduction to reactors & reactor design.

**CHB471 Physical Chemistry IVC**

3 hr/wk; ASJ226; S; Pre: CHB201 & CHB371; Pre for: CHB571, CHB590; Inc: CHB470 or CHB476

Thermodynamics of real gases & ideal solutions; surface chemistry; industrial chemical reactors; Reaction rate theory & homogeneous catalysis.

**CHB510 Instrumental Analysis**

4 hr/wk; ASJ226, CHJ129; A; Pre: CHB310 & CHB340 & CHB440 & CHB351; Pre for: CHB600, CHB601, CHB610, CHB660; Inc: CHB641

Scope of trace analysis, including method reliability, accuracy, precision, sensitivity & selectivity. Atomic absorption & atomic emission - theory & instrumentation. Determination of organic structure by mass spectrometry.

**CHB527 Chemical Technology V**

4 hr/wk; ASJ226, CHJ129; A/S: Pre: CHB327 & CHB427 & CHB470;  
Pre for: CHB600, CHB601, CHB628

Chemical engineering process analysis & its applications to selected industrial processes. An introductory study of basic economic principles & their applications to the chemical process industries. An introduction to process plant design.

**CHB530 Inorganic Chemistry V**

3 hr/wk; ASJ226, CHJ129; Pre: CHB430; Pre for: CHB600, CHB601, CHB631

A course of lectures & practical work dealing with organo-metallic chemistry; lanthanides & nuclear chemistry; inorganic rings & cages including the chemistry polyanions & metal clusters.

**CHB550 Organic Chemistry V**

4 hr/wk; CHJ129; A; Pre: CHB350 & CHB450; Pre for: CHB600, CHB601, CHB640; Inc: CHB551

A course in advanced organic chemistry which emphasises the solution of synthetic problems both in the laboratory & on the industrial scale. Topics may include choice of starting materials, major carbon-carbon bond forming procedures, selectivity & control, design of industrial organic processes, significance of reaction mechanism & structure activity relationships.

**CHB551 Organic Chemistry VC**

3 hr/wk; ASJ226; A; Pre: CHB451; Inc: CHB550; Pre for: CHB600, CHB601, CHB651, CHB691

A course in advanced organic chemistry which emphasises the solution of synthetic problems. Topics may include choice of starting materials, major carbon-carbon bond forming procedures, selectivity & control, significance of reaction mechanism, & structure activity relationships.

**CHB570 Physical Chemistry V**

4 hr/wk; CHJ129; Pre: CHB370 & CHB470; Inc: CHB571; Pre for: CHB600, CHB601, CHB640

Solid-liquid equilibria, ternary eutectics & industrial phase chemistry; equilibrium & dynamic electrochemistry & corrosion; kinetics of chain reactions.

**CHB571 Physical Chemistry VC**

4 hr/wk; ASJ226; Pre: CHB371 & CHB471; Inc: CHB570; Pre for: CHB600, CHB601, CHB671, CHB691

Solid-liquid equilibria, ternary eutectics & industrial phase chemistry; equilibrium & dynamic electrochemistry; kinetics of chain reactions.

**CHB590 Materials Science**

3 hr/wk; ASJ226, CHJ129; A/S; Pre: (CHB370 or CHB371) & (CHB470 or CHB471); Co: CHB570 or CHB571; Pre for: CHB690

The nature of solids; crystalline materials; metals; non-metallic materials & organic polymers.

**CHB600 Project**

10 hr/wk; ASJ226, CHJ129; S; Pre: (for CHJ129) CHB510 or CHB527 & 2 of (CHB530, CHB550, CHB570) or (for ASJ226) 2 of (CHB530, CHB551, CHB571)

**CHB601 Projects (Part-time students only)**

10 hr/wk; CHJ129; A/S; Pre: as for CHB600

A laboratory oriented investigation extending over 1 semester full-time or 2 semesters part-time & under the supervision of a member of staff. The project will require a literature search, further study, continuing discussion with the project supervisor & a laboratory research program. The literature search, study & discussion component of CHB600 & CHB601 is aimed to develop student competence in search techniques & experience in experimental design. The laboratory program is aimed to develop student competence in the use of experimental techniques as a basis for problem solving. Completion of the project requires the submission of a written technical report.

**CHB610 Advanced Analysis**

2 hr/wk; ASJ226, CHJ129; S; Pre: CHB510

Use of computers for on line data acquisition & instrument control. Microprocessor controlled instrumentation & dedicated data systems. Advanced instrumental techniques, with emphasis on trace techniques & associated sample handling requirements. Techniques included for discussion will be electroanalytical techniques, nondestructive techniques & thermal methods.

**CHB618 Laboratory Automation**

3 hr/wk; CHJ129;S; Pre: PHB508

Current approaches to the use of computer facilities in commercial laboratories will be emphasised in the lecture course. Discussion will centre on planning to achieve an integrated network. Instrument types to include analog output, BCD & serial digital interfaces (RS232C, IEEE, etc.). Incorporation of microprocessor controlled instruments & those instruments with dedicated data systems. Report generation & data communication systems. Polling (programmed I/O) & interrupt techniques.

**CHB627 Chemical Technology VI**

2 hr/wk; ASJ226, CHJ129; A/S; Pre: CHB327 & CHB427

Measurement & control in large-scale chemical processing. An introduction to process modelling including strategies of process operations, optimisation methods, linear programming & dynamic programming.

**CHB628 Energy Technology**

3 hr/wk; ASJ226, CHJ129; S; Pre: CHB527; Co: CHB627

A study of energy conversion systems & energy economics including choice of fuels, distribution costs & net energy analysis.

**CHB631 Advanced Inorganic Chemistry**

3 hr/wk; ASJ226; S; Pre: CHB530

Selected metals: the solution & solid state chemistry of metals such as titanium, zirconium, hafnium, chromium, molybdenum & tungsten with emphasis on structures, bonding & reaction mechanisms. Precious metals: the 'Platinum group', silver & gold; high purity chemicals. Redox systems: hydrogen peroxide & related peroxy-compounds; dithionates & the oxo-sulphur system; sodium borohydride & other complex hydrides.

**CHB640 Chemistry VI**

2 hr/wk; CHJ129; S; Pre: CHB450 & CHB470 & CHB550 & CHB570; Inc: CHB641, CHB671

Colloid chemistry & rheology; Fourier transform, laser & time resolved spectroscopy; interpretative  $^{13}\text{C}$  NMR spectroscopy; free radical & photo-chemistry & the organic chemistry of sulphur & phosphorus compounds.

**CHB641 Advanced Spectroscopy**

3 hr/wk; ASJ226; Pre: CHB340; Inc: CHB510 or CHB640

Atomic absorption & emission spectroscopy. Electron spin resonance spectroscopy. Lasers & laser spectroscopy. Mass spectrometry, particularly GC-MS. Fourier transform spectroscopy, particularly  $^{13}\text{C}$  & multi-nuclei NMR. The role of dedicated computers in these techniques will be emphasised.

**CHB651 Biological Chemistry**

3 hr/wk; ASJ226; S; Pre: CHB551

Phosphoric acids & derivatives; addition & substitution reactions, reactivity relative to carbon esters. Condensation reactions, thiol esters, fatty acid synthesis. Hydration/dehydration, terpene biosynthesis. Biological oxidation, heterocyclic coenzymes. Bioinorganic systems investigation - metal ion probes, inhibitor studies, model compounds. Hydrolytic enzymes. Biological redox systems with transition metal ions.

**CHB660 Industrial Visits**

1 hr/wk; ASJ226, CHJ129; S; Pre: CHB510

Visits to selected industries, for example, petroleum, industrial chemicals, sugar.

**CHB671 Solids & Surfaces**

3 hr/wk; ASJ226; S; Pre: CHB571; Inc: CHB640

Colloid chemistry & rheology. The surface chemistry of metals, polymers & other solid materials. Surface analysis techniques including FTIR, XPS, SAM & ESCA.

CHB690 Advanced Materials Science  
3 hr/wk; ASJ226, CHJ129; S; Pre: CHB590

Advanced materials analysis; fibre reinforced composite materials; advanced alloys; inorganic polymers; applied polymer science.

CHB691 Environmental Chemistry  
3 hr/wk; ASJ226; S; Pre: CHB551 & CHB571

The nature & composition of natural & polluted waters; metal ions, gases, redox equilibria complexation & microbial transformation of chemicals in water; water pollution & trace-level substances in water. Environmental chemistry of soils; acid-base equilibria & ion-exchange; chemicals in soil. The nature & composition of the atmosphere; chemical & photochemical reactions in the atmosphere; the oxides of carbon, sulphur & nitrogen in the atmosphere; organic pollutants & photochemical smog; particulate matter. Water & atmospheric monitoring.

CHN110 Analytical Chemistry I  
6 hr/wk; CHN217; A; Pre for: CHN210

General Introduction to Analytical Chemistry: Literature, including computer-oriented data bases. The analytical process, method selection, sampling, method validation, treatment of results, quality control, quality assurance, report presentation. Safety in the laboratory. Packaging, storage, transport & disposal of chemical materials.

Instrumental Methods for Separation & Identification: Gas chromatography, including glass capillary. Liquid chromatography including ion exchange chromatography. Data handling systems. Electrophoresis. Mass spectrometry & GC/MS plus data system.

CHN210 Analytical Chemistry II  
6 hr/wk; CHN217; S; Pre: CHN110; Pre for: CHN310

This unit provides a theoretical background in spectroscopy & an appreciation of the applications, limitations & practice of modern methods of spectrochemical analysis. Topics include molecular spectrophotometry, atomic absorption & atomic emission, x-ray fluorescence & related techniques, nuclear magnetic resonance spectroscopy & electron spin resonance spectroscopy.

CHN310 Analytical Chemistry III  
5 hr/wk; CHN217; A; Pre: CHN210; Pre for: CHN410

A study of modern electrochemical analytical techniques & an advanced level course in electrochemistry. Principles of interfacial electrochemistry, the ion double layer, electrocapillarity, electrode kinetics, evaluation of kinetic parameters, interfacial electrochemistry in chemical analysis. Thermal techniques: thermogravimetry, differential thermal analysis, differential scanning calorimetry, enthalpimetry, pyrolysis.

CHN345 Laboratory Management  
1 hr/wk; CHN217; A; Pre for: CHN510

The unit introduces concepts of modern management which are appropriate to an analytical laboratory. The functions of management. The role of the laboratory manager. Analysis of management efficiency, decision making, management techniques for decision making. Installation of laboratory equipment, selection & maintenance of laboratory equipment, calibration of equipment & apparatus, replacement policy. Purchasing & financial control.

CHN410 Analytical Chemistry IV  
5 hr/wk; CHN217; S; Pre: CHN310; Pre for: CHN510

Specialised application of analytical techniques. Trace analysis: laboratory design & practice, sample collection, pretreatment & handling. Consideration & selection of techniques & methods. Accuracy, precision, sensitivity, selectivity, reliability. Forensic chemistry: special requirements of a forensic science laboratory - sample handling, unequivocal identification, comparative procedures, security. Consideration of typical examples of forensic analysis. Outline of the Queensland legal system, the expert witness, pretrial preparation facts vs. opinions.

CHN445 Laboratory Automation  
3 hr/wk; CHN217; S; Pre: PHN350

This unit is designed to give the student 'hands on' experience with on line data acquisition & instrument control. Instruction will be given in a language appropriate to the computer system to be used. Interfacing techniques. Serial & parallel data transmission. Interrupt facilities. Domain conversion & real time data acquisition & display. Digital techniques for signal smoothing. Peak recognition techniques. Analysis of microprocessor applications in analytical instrumentation.

CHN510 Analytical Chemistry V  
8 hr/wk; CHN217; A/S; Pre: CHN410 & CHN345 & MAN255

This four semester unit includes some lecture, seminar & workshop activities, but the research/development project represents the major activity.

CHP150 Biochemical Engineering  
6 hr/wk; ASJ226; S

This subject is concerned with the application of organisms, systems & processes to productive level activities. Specific areas are in fermentation, bioprocessing & enzyme technology. Topics include: fermentation processes; microbial physiology & environmental factors in processing operations; fermentation kinetics & modelling; aeration & agitation; sterilisation, bio-reactors & scale-up. Other topics include enzymology; large-scale extraction & purification of enzymes; immobilised enzymes; application of enzymes; downstream processing; & bio-process economies.

## COMMUNICATION

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### CMA133 Communication Techniques

2 hr/wk; ASL225; A/S

An introduction to the techniques of technical writing appropriate to applied science vocations. Technical report writing, writing for non-technical audiences, media liaison, business communications. Application of communication principles in technical writing. Application of communication principles to non-written communications. Individual & group speaking. Speech writing. Oral delivery of technical papers. Formal meeting procedure. Conferences, forums, panels, interviews, symposia, debates. Use of film in scientific communication.

### CMB104 Communication I

3 hr/wk; ASJ226, CHJ129, ESJ132, MAJ133, PHK205, PHK206; A/S

The major aim of this subject is to train students to communicate successfully in writing & speaking in professional situations.

The specific objectives are to develop understanding of the theory of, & skill in, formal reporting & persuasive writing, oral reporting & persuasive speaking, group decision-making & meeting procedure, & leadership and participation.

### CMB191 Fundamentals of Photography

3 hr/wk; ASJ226; A/S

Historical development of the photographic arts, role of the photographer in society, the principles of visual perception & design, photography as both art & craft; display photography, news photography, photo layout & design; the still camera, developing, printing & enlarging; creative use of camera & darkroom. Weekly photographic assignments.

## COMPUTING SCIENCE

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### CSA259 Introduction to Computing

2 hr/wk; ASL225; S; Pre for: CHA410

Computer organisation; hardware, software; programming including BASIC; data organisation, information storage & retrieval; computer systems; social implications.

### CSB155 Introduction to Computing

3 hr/wk; ASJ226, CHJ129, MAJ133; A/S; Pre for: CSB281, CSB283, CSB280, ISB281, ISB493, MAB618, MAB706, MAB637, MAB702; Inc: CSB305

The computer as a processor of information. An overview of computers, computer organisation, systems software, programs & the range of programming languages. The design of algorithms using structured techniques & stepwise refinement. Implementation & execution of such algorithms using PASCAL.

**CSB260 Introduction to Programming**

2 hr/wk; ESJ132; S

An introduction to computers incorporating theory of computer design, the uses of computers in relevant areas of industry; together with an introductory course in FORTRAN structured to enable the student to proceed with practical applications of computing in further course studies.

**CSB262 Computing**

2 hr/wk; CHJ129; A

An introductory course in the use of digital computers for problem solving in the scientific sphere. The course includes a study of algorithm development, the specification of algorithms in a programming language & the concept of store program execution. Special emphasis is placed on interactive programming & debugging techniques.

**CSB280 Programming Principles**

3 hr/wk; ASJ226; S; Pre: CSB155; Pre for: CSB482, ISB283, CSB325, CSB321

The subject forms a continuation of the material introduced in the subject CSB155 Introduction to Computing A. In particular, to develop structured program design techniques, introduce advanced algorithms & methods of proving program correctness.

**CSB281 Computer Systems I**

3 hr/wk; ASJ226, CHJ129, MAJ133; A; Pre: CSB155; Pre for: ISB285; Inc: CSB606

To provide an understanding of

- (i) the physical organisation of a computer system
- (ii) the control & flow of information in a computer system
- (iii) the representation of data in a computer system.

**CSB283 Scientific Applications**

3 hr/wk; ASJ226; A/S; Pre: CSB155

A second-level course in programming dealing with practical use of the language FORTRAN stressing the importance of well-structured programs with emphasis on applications relevant to Science.

**CSB321 Graphics**

3 hr/wk; ASJ226; A/S; Pre: CSB280

This subject is intended to acquaint students with the nature of computer graphics hardware & software. It aims to provide a thorough grounding in the design & implementation of computer graphics software so as to enable students to implement graphic systems in their particular application areas.

**CSB325 Expert Systems**

3 hr/wk; ASJ226; A/S; Pre: CSB280

This subject introduces students to expert systems & their application to a wide range of problem solving in areas such as applied science, industry & commerce. Students will gain a

detailed understanding of some of the successful existing systems & will design an expert system as part of the practical work in the subject.

CSB482 Programming Languages & Structures  
3 hr/wk; ASJ226; A; Pre: CSB280

This subject introduces students to the study & use of efficient data structures & to a number of languages illustrating the variety of features found in computer programming languages.

## APPLIED GEOLOGY

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ESA310 Geology  
3 hr/wk; ASL225; A

An introduction to geological materials, emphasising chemical concepts & processes. Aspects studied include the origin & constitution of the earth, introductory mineralogy, igneous, sedimentary & metamorphic petrology, study of physical & structural geology, geomorphology, stratigraphy & economic geology. Field excursions as required.

ESA510 Mineralogy Techniques  
3 hr/wk; ASL225; S

Fundamental crystallography including crystal systems, forms & symmetry. Stereographic projection of crystals. Systematic treatment of mineral groups, covering aspects of structure, chemistry, properties & uses. Introduction to ore genesis. Techniques of mineral identification.

ESB101 Earth Science IA  
3 hr/wk; ASJ226, ESJ132; A; Pre for: ESB201, ESB202, ESB313, ESB363, ESB383, ESB433

Basic geological principles, origin & general constitution of earth & solar-system, global geology, economic geology. Practical work includes orthographic & stereographic solution of structural problems & identification of economic minerals. Field excursion (1 day) to local areas of interest.

ESB102 Earth Science IB  
3 hr/wk; ASJ226, ESJ132; A; Pre for: ESB201, ESB202, ESB313, ESB321, ESB363, ESB383, ESB433

Crystallography; mineralogy; formation, texture & classification of igneous, sedimentary & metamorphic rocks. Practical work includes study of crystal models, mineral & rock specimens. Field excursions (1 day) to local areas of interest.

ESB201 Earth Science IIA  
3 hr/wk; ASJ226, ESJ132; S; Pre: ESB101 or ESB102; Pre for: ESB321, ESB353, ESB383, ESB453, ESB493

Physical geology, geomorphology, erosion, weathering. Topographic maps & interpretation of land forms. Study of

major soil groups & soil formation. Hydrology. Practical work includes exercises based on interpretation of geologic, topographic & orthographic maps. Field excursions as required.

**ESB202 Earth Science IIB**

3 hr/wk; ASJ226, ESJ132; S; Pre: ESB101 or ESB102; Pre for: ESB383, ESB453, ESB493

Palaeontology, including classification & nomenclature of major phyla in animal & plant kingdoms. Stratigraphy of Australia, in particular of Queensland. Practical work involves study of fossils & map interpretation. Field excursions as required.

**ESB220 Mineralogy**

3 hr/wk; CHJ129; S; Pre for: ESB320, ESB321

Basic crystallography. Physical & optical properties of minerals & their origin. Classification of minerals. Systematic treatment of mineral groups in terms of structure, composition, properties, occurrence & use. Common rock-forming minerals. Common 'Economic' minerals. Practical work includes examination of crystal models, hand specimen examination & description of minerals, elementary optical examination of minerals in thin & polished sections & grains.

**ESB313 Mineralogy**

4 hr/wk; ASJ226, ESJ132; A; Pre: ESB101 & ESB102; Pre for: ESB413, ESB593; Inc: ESB320

Chemistry, structure, properties & occurrence of selected mineral groups. The theory & methods of optical mineralogy. Identification of minerals in grain mounts & thin sections.

**ESB320 Mineral Assemblages**

3 hr/wk; ASJ226, CHJ129; A; Pre: ESB220; Pre for: ESB530; Inc: ESB313, ESB413

The geological & geochemical cycle. Origin, emplacement & composition of igneous rocks. Weathering processes. Origin & composition of sedimentary rocks & metamorphic rocks. Methods of mineral beneficiation; problems related to mineral assemblages & textures. Practical work: Hand specimen examination of rocks & ores. Elementary microscopic examination of thin & polished sections. Exercises in mineral separation.

**ESB321 Soil Science**

4 hr/wk; ASJ226; A; Pre: ESB220 or (ESB102 & ESB201); Pre for: ESB520

An introductory course to soils & soil processes. The properties of soil profiles & their significance in pedogenesis; the influence of parent substrates, climate, relief & biological agents; aerosols of the Australian continent & past changes in climate; clays, weatherable & stable soil minerals; soil chemistry; soil physics, soil water relationships; soil classification & nomenclature; erosion; description & recognition of the major soil groups of Australia.

Twelve selected soil profiles in the Moreton District are examined, recorded & their genesis discussed. Laboratory work examines the physical & chemical characteristics of selected soils.

**ESB353 Structural Geology III**

2 hr/wk; ASJ226, ESJ132; A; Pre: ESB201; Pre for: ESB563, ESB643, ESB653

Stress-strain relationships, rock deformation by brittle fracture, petrofabrics; geometric, kinematic & dynamic analysis of folded rocks.

**ESB363 Economic Geology**

4 hr/wk; ASJ226, ESJ132; A; Pre: ESB101 & ESB102; Pre for: ESB513, ESB613; Inc: ESB530

A systemic review of metalliferous & non-metalliferous economic materials covering aspects of mineralogy, genesis, use, value, ore beneficiation of major overseas & Australian deposits. Laboratory techniques for testing & evaluating economic materials. Chemical mineralogy.

**ESB383 Field Excursions III**

1 hr/wk; ASJ226, ESJ132; A; Pre: (ESB101 & ESB102) or (ESB201 & ESB202); Co: SVB303; Pre for: ESB483

An extended (5 day or more) excursion or a series of weekend excursions to selected areas of geological interest. It will be necessary for students to submit assignments based on these excursions.

**ESB393 Field Techniques**

3 hr/wk; ASJ226, ESJ132; A; Co: ESB353 & SVB303; Pre for: ESB563

Methods of recording, analysing & presenting geological field data. Techniques for detailed mapping, reconnaissance & traverse methods, geobotany, sampling procedure. Preparation of photogeological maps & reports. Students may be required to participate in several field excursions of short duration.

**ESB403 Geochemistry**

3 hr/wk; ASJ226, CHJ129, ESJ132; S; Pre: 12 hrs first level Chemistry; Pre for: ESB520, ESB533

Distribution of elements in nature. Geochemical associations, mobility & dispersion. Sampling methods & design. Data processing, presentation & interpretation. Preparation of geochemical maps & reports. Practical aspects based on field work in selected localities.

**ESB411 Earth Resources**

3 hr/wk; ASJ226, CHJ129; S

An assessment of known resources & future alternatives. Topics discussed include crustal abundances & geochemical distributions; energy sources; metalliferous & non-metalliferous economic resources; geopolitics, realities of mineral distribution; limits of earth resources,

conservation versus exploitation; waste disposal control; environmental pollution; future technological developments & their possible effects on mineral demands.

#### ESB413 Petrology IV

4 hr/wk; ASJ226, ESJ132; S; Pre: ESB313; Pre for: ESB653, ESB543, ESB563; Inc: ESB320

The nature, origin & evolution of igneous rocks, with particular reference to abundant igneous rocks. A detailed study of metamorphism & metamorphic facies. Megascopic & microscopic examination of igneous & metamorphic rocks. Field excursions of short duration as required.

#### ESB421 Soil Science

4 hr/wk; ASJ226, CHJ129; S; Pre for: ESB520

An introductory course in soils oriented towards the field. Topics discussed include profile features & their significance in pedogenesis; the influence of parent material, climate, relief & biological agents; solonisation within the Australian continent; clays, & soil minerals; soil classification; description of the major soils of Australia. Assignment dealing with selected aspects of soil genesis or soil utilisation negotiated between departments to suit individual students' interests.

#### ESB433 Geophysics

2 hr/wk; ASJ226, ESJ132; S; Pre: 3 hrs first level Physics & ESB101 & ESB102; Pre for: ESB633

An introduction to the theory of exploration geophysics. Gravity, magnetic, radiometric, well logging, seismic refraction & reflection, electrical resistivity, induced polarisation & electromagnetic techniques.

#### ESB443 Introduction to Groundwater & Petroleum

3 hr/wk; ASJ226, ESJ132; S; Pre for: ESB523, ESB603

Groundwater hydrology, emphasising the theoretical aspects of the subject. Consideration is given to basic equations of flow, the properties of water-bearing materials; the performance of pumping bores in steady state & unsteady states & in confined & unconfined aquifers.

Composition & origin of petroleum & the nature of the source beds. Migration & accumulation of petroleum & natural gas. The formation of structural, stratigraphic & combination forms of petroleum traps.

#### ESB453 Applied Geomorphology

3 hr/wk; ASJ226, ESJ132; S; Pre: ESB201 & ESB202

Geomorphology concerns the nature, origin & development of landforms & their relationships to underlying structures. The applied aspects concern problems related to economic alluvial deposits, landslides, coastal erosion, river development & environmental geology. Terrain evaluation by aerial photograph interpretation & satellite imagery are important parts of the practical work.

**ESB473 Law for Geologists**

2 hr/wk; ASJ226, ESJ132; S

Introduction to English law, legal reasoning & the different legal systems. The Australian Constitution, Federal & State Government court systems. Contracts, torts & land law. The historical background & political framework of mining law. The legal meaning of 'mine' & 'minerals'. Mining Acts & Miner's Rights. Licensing procedures for prospecting, search & exploration. Mining leases on Crown Lands & mining on private land. The enforcement of mining interests. Petroleum legislation in Australia. Professional ethics.

**ESB483 Field Excursions IV**

1 hr/wk; ASJ226, ESJ132; S; Pre: ESB383; Pre for: ESB573

An extended (5 day or more) excursion or a series of weekend excursions to selected areas of geological interest. It will be necessary for students to submit assignments based on these excursions.

**ESB493 Stratigraphy & Sedimentation**

5 hr/wk; ASJ226, ESJ132, S; Pre: ESB201 &amp; ESB202; Pre for: ESB653, ESB603, ESB563, ESB593

Processes of formation of sedimentary rocks; weathering & erosion, sediment transport, environment of deposition, the role of tectonism in sedimentation. Sedimentary structures & textures. Marine geology: topography structure & sedimentation of the continental margins & the ocean basins.

Stratigraphic subdivision & nomenclature, the facies concept, transgression & regression, principles of correlation & the use of fossils in stratigraphy. Stratigraphy of Australia based on the tectonic evolution of the continent.

**ESB513 Economic Geology V**

4 hr/wk; ASJ226, ESJ132, A; Pre: ESB363

Detailed studies of the genesis, discovery, exploitation & use of economic materials. The following topics are introduced & references supplied for further reading - exploration programs, crustal evolution & mineralisation, ore distribution in space & time, stratiform & stratabound ores, wall rock alteration, gossans, mineral potential of the sea bed, magmatic geochemistry, isotope studies, geothermometry, clay technology. Additional miscellaneous topics are dealt with as student seminars.

**ESB520 Applied Geochemistry**

3 hr/wk; ASJ226, CHJ129; A; Pre: ESB321 or ESB421 or ESB403; Inc: ESB533

The purpose & types of geochemical surveys. Natural & unnatural associations of elements. Primary & secondary dispersion patterns. Analytical requirements for geochemistry. Optimum design & interpretation of geochemical surveys. Case histories of geochemical surveys. Sources of data on the abundance & mobility of individual elements in earth materials. The application of multipurpose regional geochemical mapping to land use evaluation. The relation of

selected trace elements to health & disease in plants & animals. Practical work includes collection, preparation & chemical analysis of earth materials in the context of a project. Several days of field work may be required.

ESB523 Hydrogeology  
3 hr/wk; ASJ226, ESJ132; S; Pre: ESB443

A continuation of the subject matter of ESB443, with the emphasis on practical aspects. The analysis of pumping tests made under a wide variety of geological conditions is studied, together with flow net analysis & the prediction of safe long term pumping rates.

ESB530 Ore Deposits  
3 hr/wk; ASJ226, CHJ129; A; Pre: ESB320; Inc: ESB363

A study of the mineralogy, genesis, use, value, mining methods, & beneficiation of selected commodities; metals of ultrabasic, pegmatic & acidic associations; gold & silver; copper, lead & zinc; antimony & mercury; beach placer metals of Australia; metals concentrated by residual processes; gem & abrasive minerals; mica & feldspar; refractories; asbestos; miscellaneous industrial minerals; evaporites; phosphate. Practical work involves examination of appropriate mineral samples & laboratory assignments introducing techniques associated with the evaluation of earth resources & with mineral separation, e.g. panning, accurate specific gravity determination, micropanner separation, grain counting, sieve analysis.

ESB533 Exploration Geochemistry  
4 hr/wk; ASJ226, ESJ132; A; Pre: ESB403; Inc: ESB520

Techniques for establishing regional geochemical patterns. The application of geochemistry to the discovery of ore deposits & to environmental problems. A field project is a major component of the practical work. Students are required to attend appropriate field trips & these may involve one or two overnight & weekend commitments.

ESB543 Petrology V  
3 hr/wk; ASJ226, ESJ132; A; Pre: ESB413

Extension of the concepts studied in ESB413 with emphasis on the less abundant rock types. Assignments & a seminar form an integral part of this unit. Practical work includes the study of selected rock suites. Field excursions of short duration as required.

ESB563 Project V  
3 hr/wk; ESJ132; Pre: ESB413 & ESB493 & ESB353 & ESB393 & SVB303; Co: ESB533 & ESB633; Pre for: ESB663

Students are required to produce an original detailed geological map of an area, prepare a preliminary geological report & deliver a seminar. Extensive field work is required.

Project V must be followed by Project VI (ESB663).

**ESB573 Field Excursions V**

2 hr/wk; ASJ226, ESJ132; A; Pre: ESB483; Pre for: ESB673

An extended (5 day or more) excursion or a series of weekend excursions to selected areas of geological interest. It will be necessary for students to submit assignments based on these excursions.

**ESB593 Sedimentary Petrology**

3 hr/wk; ASJ226, ESJ132; A; Pre: ESB493 &amp; ESB313

Provenance, lithification & diagenesis of sediments. Sandstones: principles of classification & the concept of maturity, petrology, diagenesis. Carbonate rocks: composition, classification & environment of deposition of recent & ancient carbonates. Diagenesis of carbonate sediments. Dolomites & other carbonate rocks. Characteristics & origin of other biogenic & chemical sedimentary rocks such as chert, phosphorite & ironstone.

**ESB603 Petroleum & Coal Geology**

5 hr/wk; ASJ226, ESJ132; S; Pre: ESB443 &amp; ESB493

Regional geophysical methods relevant to petroleum & coal exploration; drilling techniques & geophysical & lithological well logging as applied to petroleum & coal; qualitative well log interpretation & correlation; subsurface mapping techniques & sedimentary basin interpretation.

Coal properties, classification genesis & analysis; hydrocarbon generation from coal & oil shale. Coalfield geology. Oil field development & production; methods of primary, secondary & tertiary recovery. Petroleum & coal production & economics. Coal hand specimen study & microscopy. Field excursions of short duration as required.

**ESB613 Mineragraphy & Mining Geology**

3 hr/wk; ASJ226, ESJ132; S; Pre: ESB363

Methods of mineral search, ore prediction, exploratory drilling & mining geology. Mineral economics: fiscal conditions, financing, development & production costing. Principles of sampling & evaluation, processing of mapping, drill log & assay data. Ore reserve assessment & classification. Mining methods, grade control, comminution & beneficiation. Mineragraphy: optical properties of ore minerals, theory of reflected light, growth structures, deformation, twinning & annealing; textural interpretation, gossans. Detailed examination of ore mineral suites & host rocks. Field excursions as required.

**ESB633 Exploration Geophysics**

3 hr/wk; ASJ226, ESJ132; A; Pre: ESB433

The reduction & manipulation of geophysical data, & their interpretation in geological terms. Also included are field data acquisition & laboratory analog modelling. Field experience using a variety of geophysical methods will be gained during a field excursion.

ESB643 Structural Geology VI  
3 hr/wk; ASJ226, ESJ132; S; Pre: ESB353

Geotectonics. Structure of the earth's crust. World structural patterns. Salt tectonics. Deformation of lineations in folded rocks. Folding of inclined surfaces, unconformities, superimposed folding. Structural methods for exploration.

ESB653 Engineering Geology  
3 hr/wk; ASJ226, ESJ132; S; Pre: ESB413 & ESB493 & ESB353

The application of geology to engineering, including an introduction to soil & rock mechanics, geological factors influencing engineering design & construction & the use of geological materials in construction. Foundation conditions & site investigation techniques. Case histories of various construction projects, including dams, bridges, buildings, roads, railways, tunnels & slopes. Field excursions to appropriate construction sites.

ESB663 Project VI  
4 hr/wk; ESJ132; S; Pre: ESB563

The detailed analysis & interpretation of samples & information resulting from work done in ESB563. Preparation & presentation of a final detailed report. Some field work is required.

ESB673 Field Excursions VI  
2 hr/wk; ASJ226, ESJ132; S; Pre: ESB573

An extended (5 day or more) excursion or a series of weekend excursions to selected areas of geological interest. It will be necessary for students to submit assignments based on these excursions.

ESB693 Mining Property Evaluation  
2 hr/wk; ASJ226, ESJ132; S; Pre: MNB025

Solutions of problems involving the concepts of present value of money, place value, unit value, recoverable value, cash flow, discounted cash flow, DCFR01, payback, discounted payback, net present value, depreciation, depletion, sinking fund, annuity, diminishing annuity, compound interest, taxation & its effect on ore reserves, price forecasting, metal marketing, sampling & tonnage grade calculation, ore reserves & sensitivity analyses.

## INFORMATION SYSTEMS

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ISB281 Information Systems Analysis & Design I  
3 hr/wk; MAJ133; A/S; Pre: CSB155; Pre for: ISB282, ISB301

Provides a grounding in the methodology & techniques of systems analysis & design; aims to develop competence in techniques & application of methodologies of information systems development.

ISB282 Representation of Information

3 hr/wk; ASJ226; A/S; Pre: ISB281

Extends coverage of techniques of analysis & design; aims to further develop competency in techniques of information systems.

ISB283 Database & Procedural Languages

3 hr/wk; ASJ226; A/S; Pre: CSB280; Pre for: ISB302

This subject introduces the fundamentals & syntax of a procedural computer programming language (e.g. COBOL) & examines its use in the implementation of information systems (& in particular, database systems). Apart from developing techniques in commercial programming, the subject provides an appreciation of the advantages & disadvantages of a database approach.

ISB285 Data Communications

3 hr/wk; ASJ226; A/S; Pre: CSB281

This subject makes use of the International Standards Organisation (ISO) seven layer Open Systems Interconnection (OSI) reference model to enable students to develop an understanding of the basic theory of data communications. This provides a foundation for the subsequent discussion of the implementation of various types of information systems (e.g. distributed processing systems). It is intended to provide students with an appreciation of the implementation of data communications hardware & software in specific environments & to introduce the concepts of the design & management of data communications networks.

ISB301 Advanced Information Systems

3 hr/wk; MAJ133; A; Pre: ISB281; Pre for: ISB313

Introduces students to the concept & practice of Decision Support Systems (DSS); emphasises the development of Decision Support Systems through case studies as well as focussing on the importance of the system user.

ISB302 Database Management

3 hr/wk; ASJ226; A; Pre: ISB283

The subject focuses on the practical issues associated with the implementation & management of the database designs developed in previous subjects. It specifically addresses issues such as the performance & tuning of databases, the management of the data dictionary as well as control issues such as integrity, concurrency, backup & recovery. It is intended to provide students with an appreciation of some of the more significant commercial implementations of database architectures.

ISB313 Expert Information Systems

3 hr/wk; MAJ133; S; Pre: ISB301

Examines the role of expert systems in the commercial area & their impact on business information systems; provides an understanding of how expert systems could be used in the development of advanced business information systems; & gives

some practical experience in developing & implementing information systems containing such techniques, includes discussion on social implications of expert systems.

ISB382 Microcomputer Applications  
3 hr/wk; ASJ226; S

To expose students to common microcomputer applications. At the end of the course students will be able to:

- (i) use word processing software;
- (ii) use a database package; and
- (iii) use a spreadsheet package.

ISB493 Business Computer Programming  
4 hr/wk; MAJ133; A; Pre: CSB155; Inc: CSB306

Structured Design, modular programming, testing, maintenance, modification; vocabulary & style, algorithms for business applications & common problems, complex logic; user & management software aids, optimisation & packaging; the project environment, project control, libraries, transferability & portability; extensions to COBOL. PRG Syntax.

ISP380 Quality Information Systems  
3 hr/wk; IFM242; A

Types of information systems. Information as a resource. Past & current approaches to information systems. Decision making based on information systems. Analysis & design. Prototype concepts. Information system modelling.

## MATHEMATICS

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MAA251 Statistics & Data Processing  
2 hr/wk; ASL225; A/S; Pre for: BEA297

A basic course in statistics, including statistical terminology & organisation of data, elementary probability, binomial & normal distribution, sampling theory, regression & correlation.

MAB160 Mathematics II  
4 hr/wk; CHJ129; A/S; Pre: MAB251; Pre for: MAB257

Analytical geometry; applications of differentiation & integration; introduction to vector analysis; complex numbers; infinite series; ordinary differential equations.

MAB162 Mathematics IIG  
2 hr/wk; ESJ132; A/S; Pre: MAB251 or MAB201

Analytical geometry; applications of differentiation & integration; introduction to vector analysis.

**MAB201 Mathematics IA**

3 hr/wk; ASJ226, ESJ132; A; Pre for: MAB162, MAB204, MAB208, MAB706, MSB310, PHB310, PHB311, PHB401, PHB402; Inc: MAB251

Data handling, determinants & matrices; differentiation with applications, partial differentiation, integral calculus with applications, numerical methods.

**MAB202 Mathematics IB**

3 hr/wk; ASJ226; A; Co: MAB201; Pre for: MAB205, PHB310, PHB311, PHB401, PHB402

Algebra, analytical geometry, trigonometry, vectors, analysis, finite mathematics.

**MAB203 Mathematics IC**

3 hr/wk; ASJ226; A; Co: MAB201 & MAB202 & CSB155

A series of mathematical workshops on material covered in MAB201, MAB202 & CSB155.

**MAB204 Mathematics IIA**

3 hr/wk; ASJ226; A; Pre: MAB201; Pre for: MAB401, MAB402, MAB404, MAB406, MAB407, MAB702, MSB310, PHB310, PHB311, PHB401, PHB402

Analytical geometry, applications of differentiation & integration, introduction to vector analysis, infinite series, complex numbers, ordinary differential equations.

**MAB205 Mathematics IIB**

3 hr/wk; ASJ226; S; Pre: MAB202; Pre for: PHB401, PHB402, PHB310, PHB311; Inc: MAB309

Set theory; relations & functions; binary operations; number theory; group theory; rings & fields.

**MAB206 Mathematics IIC**

3 hr/wk; ASJ226; S; Co: MAB204 & MAB205 & MAB208

A series of mathematical workshops on material covered in MAB204, MAB205 & MAB208.

**MAB208 Statistics I**

3 hr/wk; ASJ226; S; Pre: MAB201; Pre for: MAB258, MAB404, MAB702, MSB310; Inc: MAB257

Organisation & analysis of data; probability & probability distributions; sampling; estimation; statistical inference & decision procedures involving means, variances & goodness of fit; statistical quality control; regression & correlation; ANOVA & experimental design.

**MAB251 Mathematics I**

4 hr/wk; CHJ129; A/S; Pre for: MAB160, MAB162; Inc: MAB201

Data handling; determinants & matrices; differentiation with applications; partial differentiation; integral calculus with applications; numerical methods.

**MAB257 Statistics**

4 hr/wk; CHJ129; S; Pre: MAB160; Inc: MAB208

A course in statistical methods involving elementary probability; discrete & continuous probability distributions; sampling theory; t,  $\chi^2$  & F distributions; statistical inference; regression & correlation & experimental design.

**MAB258 Experimental Design**

2 hr/wk; ESJ132; A/S; Pre: MAB208

This subject is offered in two sections. The first section of 10 lecture-tutorials provides an introduction to experimental method, basic logic of experimentation & the sources of error & uncertainty in experiments. The second section of 10 lectures & 10 tutorials introduces chi-square & F distribution, one-way & two-way analysis of variance, latin square & balanced incomplete block designs & multiple & curvilinear regression.

**MAB301 Calculus & Analysis A**

3 hr/wk; MAJ133; A/S; Pre for: MAB318, MAB601, MAB612, MAB618, MAB619, MAB637

Real valued functions; differentiation; introduction to partial differentiation; integration; techniques of integration; elementary special functions.

**MAB302 Calculus & Analysis B**

3 hr/wk; MAJ133; A/S; Co: MAB301; Pre for: MAB601, MAB612, MAB635

Infinite series; improper integrals; complex numbers; functions of complex variables, analyticity; introduction to differential equations.

**MAB309 Modern Algebra**

3 hr/wk; MAJ133; A/S; Inc: MAB205

Set theory; relations & functions; binary operations; number theory; group theory; rings & fields.

**MAB310 Linear Algebra**

3 hr/wk; MAJ133; A/S; Pre for: MAB610, MAB612, MAB618, MAB619, MAB637; Inc: MAB406

Matrices; vector spaces; linear transformations; eigenvalues & eigenvectors. Euclidean spaces; quadratic forms.

**MAB317 Mathematical Statistics**

3 hr/wk; MAJ133; A/S; Co: MAB301; Pre for: MAB318, MAB637

Collection & representation of data, parameters & statistics; introduction to the theory of probability & probability distributions; elementary treatment of sampling theory leading to the normal, t, F &  $\chi^2$  distributions; statistical estimation & tests of hypotheses based on the normal, t, F &  $\chi^2$  distributions.

**MAB318 Mathematical Statistics IIA**

3 hr/wk; MAJ133; A/S; Pre: MAB301 & MAB317; Pre for: MAB608

Introduction to quality control, introduction to non-parametric tests of hypotheses; simple linear regression & introduction to multiple linear regression; correlation; fundamentals of one factor & two factor experimental design & the analysis of variance.

**MAB331 Introductory Vector Analysis**

3 hr/wk; MAJ133; A/S; Pre for: MAB601, MAB602, MAB635

Introduction to determinants; addition & subtraction of vectors; vector products, physical & geometrical applications; differential geometry of curves; conic sections; kinematics of a particle; relative motion.

**MAB342 Mathematics of Finance**

3 hr/wk; MAJ133; A/S; Inc: MAB407

Interest rates; solution of problems in compound interest; annuities; applications of annuities; capital redemption policies; valuation of securities; effects of taxation; introduction of basic modelling techniques.

**MAB401 Mathematics IIIA**

3 hr/wk; ASJ226; A; Pre: MAB204; Pre for: MAB703, MAB705, MAB707, PHB501, PHB502

Multivariable calculus, vector analysis.

**MAB402 Mathematics IIIB**

3 hr/wk; ASJ226; A; Pre: MAB204; Co: MAB401; Pre for: MAB405, MAB701, PHB501, PHB502

Laplace Transforms, Fourier Series, ordinary differential equations.

**MAB403 Mathematics IIIC**

3 hr/wk; ASJ226; A; Co: MAB401 & MAB402 & MAB404

A series of mathematical workshops on material covered in MAB401, MAB402 & MAB404.

**MAB404 Statistics II**

3 hr/wk; ASJ226; A; Pre: MAB204 & MAB208

Introduction to quality control; non-parametric tests of hypothesis; simple linear regression & introduction to multiple linear regression, correlation; fundamentals of one factor & two factor experimental design & the analysis of variance.

**MAB405 Mathematics IVA**

3 hr/wk; ASJ226; S; Pre: MAB402; Pre for: MAB703, MAB705, MAB707

Complex analysis; partial differential equations.

**MAB406 Mathematics IVB**

3 hr/wk; ASJ226; S; Pre: MAB204; Pre for: MAB702, MAB703; Inc: MAB310

Matrices; vector spaces, linear transformations, eigenvalues & eigenvectors. Euclidean spaces, quadratic forms.

**MAB407 Mathematics IVC**

3 hr/wk; ASJ226; S; Pre: MAB204; Inc: MAB342

Interest rates, solution of problems in compound interest, annuities & applications; capital redemption policies; valuation of securities, effects of taxation; introduction to basic modelling techniques.

**MAB408 Mathematics IVD**

3 hr/wk; ASJ226; S; Co: MAB405 & MAB406 & MAB407

A series of mathematical workshops on material covered in MAB405, MAB406 & MAB407.

**MAB601 Multivariable Calculus A**

3 hr/wk; MAJ133; A/S; Pre: MAB301 & MAB302 & MAB331; Pre for: MAB906, MAB921, MAB941

Differentiation, extrema, double integrals, triple integrals, surface integrals, complex integration.

**MAB602 Multivariable Calculus C**

3 hr/wk; MAJ133; S; Pre: MAB331; Co: MAB601

Vector algebra; scalar & vector fields; line integrals; surface integrals; differential field operators; the integral properties of fields; curvilinear coordinates; application to potential theory, hydrodynamic theory & electromagnetic theory; calculus of variations, functionals; Euler's differential equation; variational problems with subsidiary conditions.

**MAB608 Mathematical Statistics IIB**

3 hr/wk; MAJ133; A/S; Co: MAB601; Pre: MAB318; Pre for: MAB907, MAB908, MAB924, MAB929

Properties & uses of the beta, gamma & exponential probability distribution; introduction to bivariate & multivariate distribution theory; multiple & curvilinear regression theory; three factor, factorial & fractional factorial experimental designs.

**MAB610 Applied Linear Algebra**

3 hr/wk; MAJ133; S; Pre: MAB310; Co: MAB612

Vector spaces & matrices; vector & matrix norms; discrete Markov chains with a finite number of states; vector spaces over finite fields; quadratic forms, least square solution of linear equations; random vectors & matrices.

**MAB612 Differential Equations**

3 hr/wk; MAJ133; A/S; Pre: MAB301 & MAB302 & MAB310; Pre for: MAB906, MAB921, MAB941

Vector spaces with inner product; linear operators in finite dimensional spaces; linear differential equations; series methods; Laplace transform; self adjoint boundary value problems & Fourier series; partial differential equations.

**MAB618 Numerical Analysis I**

3 hr/wk; MAJ133; S; Pre: MAB301(R) & MAB310(R) & (CSB305 or CSB155); Pre for: MAB619

Errors; systems of linear equations (direct methods); Solution of non-linear equations; Interpolation & approximation; Numerical quadrature; Numerical solution of first ordinary differential equations.

**MAB619 Numerical Analysis II**

3 hr/wk; MAJ133; A; Pre: MAB618 & MAB301 & MAB310; Pre for: MAB913

Systems of linear equations (iterative methods); Solution of non linear equations; Interpolation & approximation; Numerical quadrature; Eigenvalue problem; ordinary differential equations.

**MAB635 Classical Theoretical Mechanics**

3 hr/wk; MAJ133; A; Pre: MAB302 & MAB331

Mathematical model of Newtonian mechanics; statics; conservation laws of dynamics; impulsive motion in one dimension; motion of a particle in one dimension, examples; motion of a particle in two dimensions, examples.

**MAB637 Operations Research IA**

4 hr/wk; MAJ133; A/S; Pre: MAB301 & MAB317 & MAB310 & (CSB305 or CSB155); Pre for: MAB638, MAB928

The simplex algorithm; simulation, replacement, maintenance & reliability; networks.

**MAB638 Operations Research IB**

3 hr/wk; MAJ133; A/S; Pre: MAB637; Pre for: MAB927

The revised simplex method; transportation & transshipment; assignment; parametric analysis; inventory; introduction to queueing.

**MAB641 Actuarial Mathematics**

3 hr/wk; MAJ133; A; Co: MAB342

The life table; demographic techniques; pure endowments & annuities; assurances; policy values; laws of mortality; benefits depending on other contingencies; pension funds.

MAB701 Mathematics VA  
3 hr/wk; ASJ226; A; Pre: MAB402

Mathematical model of Newtonian mechanics; statics; conservation laws of dynamics; impulsive motion in one dimension; motion of a particle in one dimension; motion of a particle in two dimensions.

MAB702 Mathematics VB  
3 hr/wk; ASJ226; A; Pre: MAB204 & MAB208 & MAB406 & CSB155

The simplex algorithm, simulation; replacement, maintenance & reliability; networks.

MAB703 Mathematics VC  
3 hr/wk; ASJ226; A; Pre: MAB401 & MAB405 & MAB406

Vector spaces with inner product; linear operators in finite dimensional spaces  $X$ ; linear differential equations; series methods, Laplace transform; self-adjoint boundary value problems & Fourier series; partial differential equations.

MAB704 Mathematics VD  
3 hr/wk; ASJ226; A; Co: MAB701 & MAB702 & MAB703

A series of mathematical workshops on material covered in MAB701, MAB702 & MAB703

MAB705 Mathematics VIA  
3 hr/wk; ASJ226; S; Pre: MAB401 & MAB405

Tensor analysis; curvilinear coordinates; application to potential theory, hydrodynamic & electromagnetic theory; calculus of variations, functionals.

MAB706 Mathematics VIB  
3 hr/wk; ASJ226; S; Pre: MAB201 & CSB155

Errors, systems of linear equations; solution of non-linear equations; interpolation & approximation, numerical quadrature; numerical solution of ordinary differential equations.

MAB707 Mathematics VIC  
3 hr/wk; ASJ226; S; Pre: MAB401 & MAB405

Differentiation, extrema; double integrals; triple integrals; surface integrals; complex integration.

MAB708 Mathematics VID  
3 hr/wk; ASJ226; S; Co: MAB705 & MAB706 & MAB707

A series of mathematical workshops on material covered in MAB705, MAB706 & MAB707.

MAB906 Topics in Analysis  
3 hr/wk; MAJ133; S; Pre: MAB601 & MAB612

Topics selected from the following: measures; Lebesgue integrals; product of measures; normed spaces; metric spaces; constrained optimisation, Gateaux & Frechet derivatives.

**MAB907 Mathematical Statistics IIIA**

3 hr/wk; MAJ133; A; Pre: MAB608

Distributions of functions of random variables; estimation theory; introduction to multivariate normal distribution theory.

**MAB908 Mathematical Statistics IIIB**

3 hr/wk; MAJ133; S; Pre: MAB608

Experimental design; three factor designs, balanced incomplete designs, introduction to the analysis of covariance; introduction to stochastic processes; random walk, branching processes, Markov chains; sampling theory; random & stratified sampling; multi-stage sampling; probability proportional to size sampling.

**MAB913 Numerical Analysis III**

3 hr/wk; MAJ133; S; Pre: MAB619

Approximation; numerical solutions of ordinary differential equations; partial differential equations; overview of finite element method.

**MAB920 Coding & Encryption Techniques**

3 hr/wk; MAJ133; S; Co: MAB610

Number theory, finite fields, linear shift registers, block coding theory, cyclic codes, BCH & Reed-Solomon codes, block coding techniques, convolutional codes, introduction to cryptography stream ciphers, block ciphers, public key systems, secure speech communications.

**MAB921 Methods of Mathematical Physics A**

3 hr/wk; MAJ133; A; Pre: MAB601 &amp; MAB612

Equations of mathematical physics; mathematical methods, separation of variables; transform method; conformal transformation; theory of distributions & applications to Green's function method; finite difference method; two dimensional wave equations, examples; two dimensional heat equation, examples; two dimensional Laplace equation.

**MAB924 Applied Statistical Techniques**

3 hr/wk; MAJ133; S; Pre: MAB608

The general linear model; errors in variables; autocorrelation; single equation problems; simultaneous equations problems; estimation methods.

**MAB927 Operations Research IIA**

3 hr/wk; MAJ133; A; Pre: MAB638

Linear programming; integer & non-linear programming; dynamic programming; Heuristic methods.

**MAB928 Operations Research IIB**

3 hr/wk; MAJ133; S; Pre: MAB637

Simulation; queueing; decision analysis; implementation in operations research.

**MAB929 Statistical Forecasting**

3 hr/wk; MAJ133; A; Pre: MAB608

Introduction; smoothing methods; decomposition methods; ARMA time series methods; Box-Jenkin method, causal models; quantitative & technological methods of forecasting; comparison & selection of forecasting methods.

**MAB941 Methods of Mathematical Economics**

3 hr/wk; MAJ133; A; Pre: MAB601 &amp; MAB612

Mathematical models in economics; macroeconomic models; techniques for dynamic economic models; introduction to stability theory; stability of non-linear systems; optimization theory; the maximum principles of Pontryagin; optimal economic growth.

**MAB960 Project Work**

3 hr/wk; MAJ133; A/S; Pre: Successful completion of at least two third level optional units in addition to all mandatory mathematics units.

Students, either individually or in small groups, undertake a substantial project which is relevant to the needs of industry & which is designed to give students insight into industrial requirements. Each student, or group of students, undertakes a different project & is supervised, generally by a member of staff who provides guidance throughout the duration of the project.

**MAN255 Statistics**

2 hr/wk; CHN217; A; Pre for: CHN510

Development of a sound working knowledge of the basic ideas incorporated in the topics listed below & the application of this knowledge to situations frequently occurring in the fields of Analytical Chemistry.

**MAP111 Statistical Methods in Quality**

3 hr/wk; IFM242; A

Describing variation, frequency distribution, histogram, estimation of parameters. Important distributions useful in describing quality-related phenomena, binomial, hypergeometric, Poisson, normal, exponential, Weibull. Approximations, Poisson to binomial, normal to binomial, etc. Sampling distributions. Interval estimation & tests of hypotheses. Type I & type II errors.

**MAP121 Statistical Process Control**

3 hr/wk; IFM242; S

Basic concepts & preliminary considerations. Control chart procedures for variables, S & R charts, pattern analysis & interpretation. Process capability study, natural tolerances, capability ratio, modified control charts. Attribute control charts, construction & interpretation of p, c & u charts. Cusum techniques for continuous data, scope & principles, procedure & interpretation, testing techniques - V mask, decision interval. Cusum applications to discrete data. SPC computer software.

MAP211 Sampling Procedures

3 hr/wk; IFM242; A

Basic concepts & principles in sampling. Attribute batch sampling, sampling plans (single, double & multiple), O.C. curves. AS1199, terminology & definitions, choice of plan & switching rules. Attribute batch sampling with rectifying inspection, Dodge Romig procedure, use of tables. Attribute continuous sampling & the Dodge system (CSP-1 etc). Sampling by variables, plans & procedures. AS2490, terminology & definitions, inspection rules.

MAP221 Quality Problem Solving Techniques

2 hr/wk; IFM242; S

Collection of data & use of check sheets. Histogram as a diagnostic tool. Pareto diagram, stratified data, use of weighted factors; Ishikawa chart, dispersion analysis & process classification type. Kepner Tregoe technique. Correlation analysis, scattergram & the Tukey corner test, independence & spurious correlation, regression equation & prediction. Design of experiments, principles & basic concepts, Latin Square design, factorial experiments, hierarchical designs.

IFP222 Project

2 hr/wk; IFM242; S

The project is intended to ensure that students obtain experience in a practical application of significant proportions. The student receives broad guidance from a qualified supervisor but progress depends on the student's initiative & problem solving ability. The project will normally involve presentation of a seminar in addition to the preparation of a full report on the aims & objectives of the project and the result achieved.

## MECHANICAL & MANUFACTURING ENGINEERING

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MEP173 Quality Control Planning

3 hr/wk; IFM242; A

Survey & appraisal of procedures. The specification of standards. Establishing the quality manual of procedures. Quality Audit principles. Control using automatic, statistical/human methods. Source inspection methods. Introduction to basic control loop techniques - open, closed & manually closed. Quality data collection & analysis. Control of instruments & gauges & its relationship to physical standards.

MEP273 Quality Measurement & Testing

3 hr/wk; IFM242; S

Introduction to measurement, inspecting & testing. Definitions, standards. Measurement by observation or instrumentation as applied to any process or procedure, calibration systems, techniques & applications. Acceptance inspection, inspection planning & applications. Testing

principles & procedures, types, uses. Instrumentation of test facilities. Laboratory quality assurance. Data Analysis & uncertainties. Laboratory & facility management.

MEP371 Reliability and Maintainability  
3 hr/wk; IFM242; A

Introduction to reliability & maintainability. Relationship between reliability & quality. Relationship between designer, manufacturer & operator. Means of achieving high reliability & maintainability. Fundamental theory of reliability. Reliability data analysis. Practical applications of Weibull's distribution to reliability & maintainability. Modelling for reliability. Computerised maintenance systems, economics & systems availability.

MEP473 Quality Systems and Assessment  
3 hr/wk; IFM242; S

Review of Australian Standards 1821-23, 2000 & other project quality systems standards. Quality assessment schemes. How to conduct an audit based on the standards. The interaction between quality manual, quality system & quality plan. Queensland state purchasing policy requirements. Australian Standards supplier assessment scheme.

## MANAGEMENT

Subject details for other elective units are set out in the Business Faculty Handbook.

MNB025 Economic Analysis for Geologists  
2 hr/wk; ESJ132; A; Pre for: ESB693

Local & overseas investment; world mineral commodity markets; mineral development financing; taxation; mineral statistics; mineral industries studies.

MNB026 Administration for Geologists  
3 hr/wk; ESJ132; A

Organisation & management; mineral industries studies, company structure.

MNBD40 Management  
1 hr/wk; CHJ129; S

An introductory study of management including the functions of management, leadership, motivation & supervision of staff, & employee relations.

MNB101 Applied Psychology  
3 hr/wk; ASJ226; A/S; Pre for: MNB201, MNB250, MNB307, MNB450

An introduction to selected areas of psychology to give a behavioural base to subsequent studies in the management & organisational science area & to provide limited skills training in some areas for personal development. A learning unit investigates conditioning, imitation & higher order learning.

A second unit on individuals & groups examines the development & assessment of individuals within groups. Other units examine perception human development & social skills, including assertiveness & stress management.

**MNB132 Microeconomic Analysis**  
3 hr/wk; ASJ226, MAJ133; A/S

This subject will examine how managers make decisions in firms in the Australian economy. The role of consumers & firms in various markets will be studied. Production & market strategies for managers in different types of firms will be examined. Lastly, constraints on manager's decisions & other contemporary issues in Australian microeconomics will be examined.

**MNB201 Introduction to Human Resource Management**  
3 hr/wk; ASJ226; A/S; Pre: MNB101

The aim of the subject is to introduce the basic concepts of organisational behaviour to explain why employees feel & act the way they do & therefore to show how human resources in organisations can be most effectively utilised.

Theories & research data relating to employee motivation, productivity & satisfaction, labour turnover & absenteeism will be presented, followed by the processes & techniques used to optimise these. The latter will include consideration of job design techniques, leadership style, group processes & the personnel role, including the selection process & training techniques. In this way two processes will be considered to increase productivity & satisfaction: fitting the person to the job & fitting the job to the person

**MNB232 Macroeconomic Analysis**  
3 hr/wk; ASJ226; A/S

Macroeconomic Analysis is concerned with the economic problems that occur at the national level. The aim of the subject is to ensure that students understand the economic problems at this level & appreciate the effects on the business community & on individuals of the Federal Government's attempts to manage these problems in Australia. Specific topics covered in the subject include: economic systems, management techniques associated with a capitalist economy, unemployment, inflation - its causes & effects & international trade.

**MNB250 Developmental Psychology**  
3 hr/wk; ASJ226; A; Pre: MNB101

This subject provides students with a basis for the study of the promotion of psychological health of individuals at differing developmental stages. The content includes psychological adjustment, developmental theories, developmental aspects of childhood, adolescences, middle & old age & specific areas such as sexual development, death & dying.

MNB307 Social Psychology  
3 hr/wk; ASJ226; A/S; Pre: MNB101

This topic has a base of both traditional research findings and more recent developments in contemporary Social Psychology. It applies these to the areas of business, the law, and the community among others. This gives a basis for the students to apply their knowledge to one or more areas of their public, private or work life.

MNB406 Introductory Marketing  
3 hr/wk; ASJ226; A/S

Nature & scope of marketing. Introduction of the marketing concept. Understanding consumer behaviour & preferences. Marketing systems. Overview of marketing research. The various components of the marketing research. The various components of the marketing mix, viz. product planning, pricing, distribution, promotion, presented independently & on an integrated basis. Formulating the marketing plan. Effect of marketing policies & practices.

MNB450 Physiological Psychology  
3 hr/wk; ASJ226; S; Pre: MNB101

This subject examines the physiological and cognitive bases to human behaviour. In particular, it gives attention to such areas as the nervous and endocrine systems of the body, the brain and its functioning; learning, information processing, memory and problem solving; consciousness and altered states of consciousness; hormones and drugs and their effects on emotional expression; the development of intelligence; and overall the relation of physiological and cognitive factors to motivation and behaviour.

MND129 Psychology for Health Professionals A  
2 hr/wk; PHK205, PHK206; S

An introduction to the concepts of interpersonal skills; stress, changing behaviour, working with other health professionals.

MNP112 Quality System Management  
3 hr/wk; IFM242; A

Introduction to the role of quality in a modern company. Quality as a measure of both organisational performance, & of products and services. Quality as a total management philosophy. Comparative management practices in quality: Japan, Europe & North America; application to Australia. Organising for quality; organisational structure; the quality plan; the manual of procedures. Managing for quality: use of statistics; continuous improvement implementing company-wide quality control.

MNP113 Managing Communications for Quality  
3 hr/wk; IFM242; A

Communication as part of a quality process: management, employees, customers & suppliers in the communication network.

Communicating the quality plan: commitment; policy; objectives. Employee participation: consultation & feedback to improve quality; quality circles & Australian organisations. Management communication on quality; what information should be reported; how to present it; interpersonal & negotiation skills; written communications. Introduction to market research. Communicating with the market & with the business environment. Quality as a customer determination; the Deming cycle & its implications.

MNP123 Human Factors in Quality  
3 hr/wk; IFM242; S

Human behaviour concepts & their application to quality management. Interpersonal skills & organisational culture, intrapersonal factors. Concepts in motivation, perception, learning, attitudes, etc. Ergonomics & work place design, aspects of the work environment which can affect performance.

MNP218 Economic Analysis  
3 hr/wk; IFM242; A

Australia's international trading performance relative to other industrialised nations. The potential economic impact of quality control systems on primary, secondary & tertiary sectors of Australian industry. Economics of the firm & the quality factor, quality as a determinant of demand, demand elasticity, goods attribute theory. Tools for incorporating quality into investment decisions: opportunity & marginal costs; obsolescence & economic life; repair & major overhaul; criteria for comparing economic alternatives.

## MEDICAL LABORATORY SCIENCE

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MSA113 Introductory Biochemistry  
3 hr/wk; ASL225; S

Molecular aspects of cellular structure & organisation. Nomenclature & basic chemistry of simple biological molecules. Amino acids & proteins: fibrous & globular proteins; enzymes & factors affecting their activity. Structure, function & reactions of carbohydrates & lipids & their role as structural components & metabolites. Nucleic acids in cell growth & syntheses. Cell dynamics & analytical methods.

MSA161 Microbiology I  
3 hr/wk; ASL225; A; Pre for: MSA162

An introduction to the biology of bacteria, fungi, algae, protozoa & viruses, with consideration of structure, nutrition, reproduction, genetics & classification systems.

**MSA162 Microbiology II**

3 hr/wk; ASL225; S; Pre: MSA161

The growth of microbial populations & methods of controlling growth, sterilisation & disinfection methods; enzymic activity of microorganisms; the identification of the microorganisms more important in public health; host parasite relationships & an introduction to immunity.

**MSB101 Microbiology I**

3 hr/wk; ASJ226, CHJ129; S; Pre for: MSB102, MSB415, MSB450, MSB473

The subject acts as an introduction to the study of microbiology, biochemistry & biotechnology. The diversity of microbes is presented together with the various forms of microscopy used to study them. Important biological molecules, both inorganic & organic, are discussed with emphasis on the mode of action of enzymes & their role in energy production. A detailed study is made of the morphology of eukaryotic cells, prokaryotic cells & viruses.

**MSB102 Microbiology II**

3 hr/wk; CHJ129; A; Pre: MSB101 & MSB473(R) & MSB474(R); Pre for: MSB103

A continuation of basic microbiology introduced in MSB101. Lectures & practical exercises will deal with aspects of microbial nutrition, control of microbial populations, genetics, principles of taxonomy & the identification of bacteria.

**MSB103 Microbiology III**

3 hr/wk; CHJ129; S; Pre: MSB102

The subject deals with aspects of applied microbiology & the taxonomy of important groups of microorganisms, pathways of metabolism, genetic manipulation, biodeterioration & bio-leaching, fermentations, biological waste treatment, microbial ecology, agricultural microbiology & water & food microbiology.

**MSB310 Biochemical Methodology III**

4 hr/wk; ASJ226; A; Pre: MAB201 & MAB204 & MAB208; Co: MSB415; Pre for: MSB410, MSB521

A companion to MSB415 emphasising biochemical laboratory methods & practice & dealing with pH measurement & buffers, UV & visible spectrophotometry, chromatography, electrophoresis & isotope techniques.

**MSB410 Biochemical Methodology IV**

4 hr/wk; ASJ226; S; Pre: MSB310; Co: MSB416; Pre for: MSB530, MSB621

A companion subject to MSB416 which continues the studies of MSB310. This unit extends studies of chromatographic & electrophoretic methods, protein binding techniques & the methodology of protein & nucleic analysis.

**MSB412 Immunology**

4 hr/wk; ASJ226; S; Pre: MSB450 & PNB231; Pre for: MSB712

A study of the mechanisms of the immune process including the nature of antigens, antibodies, antigen-antibody reactions, antibody formation control of the humoral & cell-mediated immune responses, hypersensitivity & allergy & immunisation of man against infections.

**MSB415 Biochemistry III**

5 hr/wk; ASJ226; A/S; Pre: CHB201 & CHB202 & MSB101; Pre for: MSB416

A course of lectures & laboratory exercises introducing the study of biological molecules & systems & dealing with biochemical systems, amino acid & protein biochemistry, basic enzymology, an introduction to bioenergetics, general metabolism & carbohydrate biochemistry.

**MSB416 Biochemistry IV**

5 hr/wk; ASJ226; A/S; Pre: MSB415; Pre for: MSB520, MSB530, MSB620, MSB716, MSB718, MSB756

An extension of MSB415 considering further aspects of carbohydrate metabolism, lipid biochemistry & metabolism, basic porphyrin biochemistry, protein & amino acid metabolism, nucleic acid biochemistry, introductory protein biosynthesis & molecular biology.

**MSB450 Microbiology III**

3 hr/wk; ASJ226; A/S; Pre: MSB101; Co: MSB415; Pre for: MSB412, MSB454

An introductory core unit of lectures & practical exercises in Microbiology dealing with cytology, nutrition, genetics, control of microbial populations, & principles of taxonomy.

**MSB454 Microbiology IV**

4 hr/wk; ASJ226; S; Pre: MSB450; Co: MSB416; Pre for: MSB510, MSB511, MSB512, MSB610, MSB611, MSB712, MSB718, MSB755, MSB756

This subject is an extension of the basic course in microbiology (MSB450) & introduces aspects of microbial taxonomy; metabolism; action of antimicrobials; infection processes & epidemiology; microbial ecology in soil & water; inter-relationships with animals & plants; food & industrial microbiology; microbial genetics; laboratory safety. The subject provides knowledge of aspects of basic microbiology required to proceed to the more advanced units offered at the third year level.

**MSB473 Biochemistry III**

3 hr/wk; CHJ129; A; Pre: MSB101 & CHB150 & CHB250; Pre for: BEB405, MSB474, MSB102

This subject will cover the biochemistry of proteins including structure-function relationships, enzymology including basic kinetics & control mechanisms relevant to metabolism, the mechanism & role of the Krebs (Citric Acid) Cycle including stoichiometry & energetics & bioenergetics including the mechanisms of electron transport & synthesis at ATP.

**MSB474 Biochemistry IV**

3 hr/wk; CHJ129; A; Pre: MSB473 & CHB350; Pre for: MSB102

This subject will cover the biochemistry of polysaccharides, carbohydrate metabolism, lipid biochemistry including structure-function relationships, lipid metabolism, amino acid katabolism & nitrogen excretion, the structural biochemistry of the nucleic acids & basic mechanisms in protein biosynthesis including an introduction to molecular genetics.

**MSB510 Food Microbiology**

3 hr/wk; ASJ226; A; Pre: MSB454

A course of lectures & associated practical work dealing with aspects of the microbiology of foods & water. Topics include foodborne infections & intoxications; food hygiene; food ecology & its relationship to spoilage & preservation; fermentations; methods of microbiological examination of foods.

**MSB511 Microbial Physiology & Metabolism V**

4 hr/wk; ASJ226; A; Pre: MSB454

An advanced course of lectures & practical sessions relating to the composition, organisation, structure & activity of the microbial cell. Topics include cell structure; enrichment, isolation & growth of cultures; cells, populations & the kinetics of growth; biosynthesis of cellular materials; regulation of metabolism; microbial genetics; sporogenesis & germination.

**MSB512 Virology**

3 hr/wk; ASJ226; A; Pre: MSB454

A course of lectures & laboratory sessions dealing with the nature of virus, viral replication & viral propagation. Cell culture methods will be considered essentially as they pertain to viral propagation, with emphasis on animal viruses.

**MSB520 Biochemistry V**

5 hr/wk; ASJ226; A; Pre: MSB416

An extension of studies begun in MSB415 & MSB416 considering further aspects of carbohydrate metabolism emphasising non-mammalian systems, lipid metabolism including steroid biosynthesis, amino acid metabolism in mammalian & non-mammalian systems & regulation & integration of metabolism.

**MSB521 Biochemical Separations**

4 hr/wk; ASJ226; A; Pre: MSB310; Co: MSB520

A companion unit to MSB520 offered mainly as a laboratory-based instructional unit, which extends & applies the matter introduced in MSB310 as advanced techniques in a program for the separation of selected biomolecules. The integrated application of centrifugation, chromatography, electrophoresis, spectrophotometry & other techniques as relevant will be demonstrated & applied.

**MSB525 Project**

3 hr/wk; ASJ226; Y; Co: major in microbiology/biochemistry

All students doing a major in microbiology/biochemistry will be required to select, in cooperation with a supervisor, a suitable project. The aims of the project are that students, under supervision, should -

- (1) participate in the selection of a suitable topic for investigation;
- (2) conduct a literature search in the subject area;
- (3) plan an experiment program which includes scheduling laboratory space, equipment, consumables with due consideration of costs;
- (4) undertake work at the bench, inevitably experience failure & repeat or redesign experimental programs as necessary;
- (5) record, assess & interpret results;
- (6) write an account of the project in a standard form of presentation;
- (7) present an account of the project orally if required.

Appropriate industrial experience may be accepted in lieu of a project, but students applying for exemption would need to submit a report on that industrial experience in a form suitable for examination.

**MSB530 Introductory Molecular Biology**

5 hr/wk; ASJ226; A; Pre: MSB410 & MSB416; Pre for: MSB630

An introductory subject of lectures & practical exercises in molecular biology including types and structures of DNA & RNA, the genetic code & protein synthesis; DNA replication, repair & mutability; transcription & translation; gene structure, function & expression in prokaryotes & eukaryotes; transferable DNA including plasmids, bacteriophage & transposable elements.

**MSB610 Microbial Technology**

5 hr/wk; ASJ226; S; Pre: MSB454

An advanced course of lectures & practical sessions dealing with the industrial use of microorganisms & single cell cultures. Topics include screening & strain development; large scale fermentation; product recovery; production of: immunising agents & diagnostic reagents; primary & secondary metabolites of industrial importance; single cell protein; microbial transformations; biological waste treatment; bio-deterioration & bioleaching.

**MSB611 Applied Microbiology**

4 hr/wk; ASJ226; S; Pre: MSB454

An advanced course of lectures & practical sessions with emphasis upon microbiological methodology. Topics to include light & electron microscopy; genetic manipulation; systematics; immunological techniques; preservation of cultures & cell lines; laboratory safety.

**MSB620 Biochemistry VI**  
5 hr/wk; ASJ226; S; Pre: MSB416

An extension of studies begun in MSB415 & MSB416 considering further aspects of protein chemistry, physical biochemistry, enzymology, bioenergetics, advanced concepts in protein biosynthesis, applied biochemistry.

**MSB621 Analytical Biochemistry**  
4 hr/wk; ASJ226; S; Pre: MSB410; Co: MSB620

A companion unit to MSB620 which extends the subject matter of MSB410 into biochemical analysis. This subject treats enzyme-based analyses, advanced analysis using isotopes, immunoassays & specific methods for the major biomolecules.

**MSB630 Genetic Engineering**  
5 hr/wk; ASJ226; S; Pre: MSB530

This subject of lectures & practical exercises introduces the techniques in genetic engineering including the enzymes, the vectors & hosts, gene isolation & detection of recombinant genes, strategies of gene cloning, genomic & cDNA libraries & gene identification & applications of genetic engineering.

**MSB712 Immunology**  
4 hr/wk; ASJ226; A; Pre: MSB412 & MSB416 & MSB454

This unit concentrates on new clinical laboratory applications, including immunopathology, immunoassays & assessment of immune function.

**MSB718 Clinical Biochemistry V**  
4 hr/wk; ASJ226; A; Pre: MSB416 & MSB454 & PNB465 (see strand coordinator); Pre for: MSB719

This course introduces the study of chemical aspects of human life in health & illness & discusses the application of chemical laboratory methods to diagnosis, control of treatment & prevention of disease. Topics include kidney, pancreas, liver & gastric functions, & the metabolism of lipids, carbohydrates & proteins.

**MSB719 Clinical Biochemistry VI**  
4 hr/wk; ASJ226; S; Pre: MSB718

This course further develops clinical biochemistry with emphasis on enzymes, electrolytes, blood gases, drugs, vitamins, functions of the thyroid & adrenal gland, autoanalyses, quality control & steroid metabolism.

**MSB755 Microbiology V**  
7 hr/wk; ASJ226; A; Pre: MSB454 & MSB445 (see strand coordinator)

The subject consists of three parts: parasitology, virology & mycology. In parasitology study is directed towards the laboratory diagnosis of parasitic diseases with emphasis on those evident in Australia & those most likely to penetrate the quarantine barrier. It includes identification, life history, epidemiology & control of the parasite. Virology includes an

introduction to the characteristics of viruses commonly causing human disease & methods for laboratory diagnosis. Mycology deals with characterisation of fungi responsible for systemic & superficial infections in humans.

**MSB756 Clinical Bacteriology VI**

7 hr/wk; ASJ226; S; Pre: MSB416 & MSB445 & MSB454 (see strand coordinator)

A study of clinical bacteriology, dealing with the characteristics, isolation & identification of bacteria implicated in human disease, the collection & examination of clinical specimens & antibiotic sensitivity tests on laboratory isolates.

**MSD420 Pathology**

4 hr/wk; PHK205; S

This unit deals with the aetiology & pathology of the various systems; their radiographic appearances; the use of contrast media as a diagnostic aid.

**MSN111 Biochemistry**

2 hr/wk; PHN176; A

A subject in modern biochemistry dealing with those concepts essential to an understanding of human biological functions. This subject is designed to supplement that in Anatomy & Physiology I. Includes the principles of biochemical analysis used in clinical laboratories; electrochemical electrodes, electrophoresis, dialysis, chromatography as well as the application of colorimetry, spectrophotometry, flame photometry, atomic absorption & fluorescence to clinical biochemistry.

**MSP120 Advanced Genetic Engineering**

6 hr/wk; ASJ226; A

An advanced course of lectures & practical exercises dealing with advanced techniques of recombinant technology. Topics include strategies used for gene cloning; production of cDNA & expression libraries; cloning in other bacterial, yeast, virus & plant vectors; isolation of mRNA; separation of chromosomes by electrophoresis; use of gene probes for disease diagnosis & differentiation; a sequencing as well as applications of genetic engineering in the areas of disease resistance, vaccines, hormones, food, plants & industrial microbiology.

**MSP121 Research Strategies I**

3 hr/wk; ASJ226; A

This subject consists of (a) a series of seminars presented by appropriate staff of the Faculties of Health Science & Science & other research scientists on research strategies & directions in their area of expertise, the philosophy of Science, the evolution of research projects & applying for grants, (b) invited lectures, departmental seminars & external public lectures or seminars in the areas of biochemistry, biotechnology or microbiology including both research and business topics, (c) three seminars presented by the student,

two of which will be related to the student's project in MSP125 & one from an unrelated area & (d) from time to time, formal instruction in areas related to research such as biometry & computer analysis.

**MSP122 Research Strategies II**  
3 hr/wk; ASJ226; S

This subject is the second semester continuation of Research Strategies I (MSP121).

**MSP123 Readings in Biotechnology I**  
3 hr/wk; ASJ226; A

This subject consists of the preparation of a literature review of direct & associated relevance to the Honours Project (MSP125). The literature review, under the guidance of the supervisor(s), will include an initial computer search, an "in depth" computer search, the presentation of a written paper demonstrating a considerable knowledge, understanding & appreciation of the literature as well as a critical appraisal of future research requirements.

**MSP124 Readings in Biotechnology II**  
3 hr/wk; ASJ226; S

This subject consists of the preparation of a paper reporting the methods and results of investigations in the Honours project (MSP125). The paper will also include an introduction, analysis & discussion of the project in a style & length deemed to be appropriate by the Head of Department.

In the course of this subject students should relate their project work to published work already undertaken in the relevant field.

In addition, students will be required to complete a reading program in broad areas of microbiology &/or biochemistry &/or biotechnology.

**MSP125 Project**  
9 hr/wk; ASJ226; Y

All students undertaking Honours in biotechnology, biochemistry or microbiology will be required to select & undertake, in consultation with a supervisor, a suitable project.

## **NURSING STUDIES**

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**NSD101 Principles of Patient Care**  
1.4 hr/wk; PHK205, PHK206; A

This introductory unit emphasises the ethical, legal & clinical accountability of the radiographer for safe patient care. The subject aims to develop in radiography students an awareness of their responsibilities in protecting patients & promoting their well-being.

## PHYSICS

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### PHA154 Introductory Physics

3 hr/wk; ASL225; A

An introduction to the basic concepts involved in the study of linear mechanics, ideal gases, liquids & solids, elasticity, surface tension, temperature & its measurements, heat content, heat transfer, reflection & refraction of light at plane surfaces, use of lenses in simple optical instruments, current electricity, e.m.f. resistance, circuit analysis, heating effect, electrical measurements using moving coil galvanometers, potentiometers & Wheatstone bridge, magnetic field with simple applications. A series of laboratory experiments is used to emphasise the above concepts.

### PHA258 Introductory Electronics

2 hr/wk; ASL225; S

A course of lectures & practical experiments covering measurement of dc & ac voltage & current with analogue & digital instruments, characteristics & applications of operational amplifiers & digital electronics.

### PHA354 Photographic Techniques

1 hr/wk; ASL225; S

This unit deals with the practice of picture-taking, film development & printing, including the photographic process, darkroom equipment, camera types & controls, lenses & accessories, film types & printing techniques.

### PHB104 Introductory Physics

3 hr/wk; ASJ226; A; Inc: Senior Physics; Pre for: PHB110, PHB111, PHB210, PHB211

This subject is intended to give the student a grounding in basic physics topics selected from the following areas: mechanics, heat, electricity & magnetism & light.

### PHB110 Physics IA

3 hr/wk; ASJ226, CHJ129, ESJ132; A; Co: PHB104 unless Senior Physics has been undertaken; Pre for: PHB310, PHB311, PHB316, PHB401, PHB402, PHB410, PHB611, CHB327

A course of lectures, tutorials & laboratory work covering dynamics, fluid mechanics, vibrations & waves, sound, gravitation & geometrical optics.

### PHB111 Physics IB

3 hr/wk; ASJ226, CHJ129, ESJ132; A; Co: PHB104 unless Senior Physics has been undertaken; Pre for: PHB310, PHB311, PHB316, PHB401, PHB402, PHB611, CHB327

A course of lectures & laboratory work on ac & dc circuit theory & electronics.

**PHB210 Physics IIA**

3 hr/wk; ASJ226, ESJ132; S; Pre: PHB104 or Senior Physics; Pre for: PHB310, PHB311, PHB316, PHB401, PHB402, PHB410, PHB611

A course of tutorials, lectures & laboratory work on thermal physics, optics & electromagnetic fields.

**PHB211 Physics IIB**

3 hr/wk; ASJ226, ESJ132; S; Pre: PHB104 or Senior Physics; Pre for: PHB310, PHB311, PHB316, PHB401, PHB402, PHB611

A course of lectures & laboratory work on physical optics, & modern & radiation physics.

**PHB260 Physics IIG**

4 hr/wk; CHJ129; S; Pre for: CHB327

A course of lectures & tutorials in gravitation, mechanical properties of solids, thermal physics, electrostatics, magnetostatics, electromagnetic fields & waves, quantum physics, nuclear & radiation physics.

**PHB308 Electronics I**

3 hr/wk; ASJ226, CHJ129; A; Pre: 2 semesters tertiary study (PHB111 preferred); Pre for: PHB405, PHB408

A program of lectures & laboratory work covering basic measurement techniques & instrumentation, solid state components such as diodes, transistors, FET's & optoelectronics, feedback theory & applications.

**PHB310 Wave Theory & A C Circuits**

3 hr/wk; ASJ226; A; Pre: At least 3 of (PHB110, PHB111, PHB210, PHB211) & at least 2 of (MAB201, MAB202, MAB204, MAB205); Co: MAB402 is recommended; Pre for: PHB501, PHB502

A course of lectures & tutorials on undamped & damped oscillations, forced oscillations, coupled oscillations, wave transmission & reflection, examples of wave systems, ac network analysis, resonance, transformers, bridges.

**PHB311 Optics & Acoustics**

3 hr/wk; ASJ226; A; Pre: as for PHB310; Pre for: PHB608

A course of lectures & tutorials on interference & diffraction, Fourier methods, coherence & correlation, lasers & holography, sound waves, loudspeakers & microphones, acoustic properties of materials, architectural acoustics & measurement of noise.

**PHB316 Experimental Physics III**

3 hr/wk; ASJ226; A; Pre: At least 3 of (PHB110, PHB111, PHB210, PHB211); Co: at least 1 of PHB310, PHB311; Pre for: PHB416

This course is designed to further the education of students in the field of experimental physics. They are exposed to activities including laboratory experiments in electricity & magnetism, acoustics, optics & materials physics.

**PHB401 Thermal & Vacuum Physics**

3 hr/wk; ASJ226; S; Pre: as for PHB310; Pre for: PHB601

A study of statistical mechanics, thermodynamics & vacuum physics.

**PHB402 Relativity & Radiation Physics**

3 hr/wk; ASJ226; S; Pre: as for PHB310; Pre for: PHB501, PHB602, PHB609

A study of relativity & particle physics.

**PHB405 Instrumentation**

3 hr/wk; ASJ226; S; Pre:PHB308

A course of lectures, laboratory work & field trips on instrumentation systems, transducers, signal processing, telemetry, control systems, display & recording systems.

**PHB408 Electronics II**

3 hr/wk; ASJ226, CHJ129; S; Pre: PHB308; Pre for: PHB508

A program of lectures & laboratory work covering radio-frequency circuits, noise, analog integrated circuits & applications, digital circuitry, counters, shift registers, A-D & D-A conversion.

**PHB410 Physical Properties of Materials**

3 hr/wk; ASJ226; A; Pre: PHB110 & PHB210; Pre for: PHB510, PHB511

Forces between atoms & the condensed state. Properties of fluids - static & dynamic. Metallic, organic & ceramic phases & their properties. Perfect & imperfect structures. Mechanisms of deformation on a macroscopic & microscopic scale including diffusion, elastic & plastic characteristics, creep & fatigue. Reactions & modifications of phase properties, reaction rates.

**PHB416 Experimental Physics IV**

6 hr/wk; ASJ226; S; Pre: PHB316; Co: at least 1 of PHB401, PHB402; Pre for: PHB516

This unit will consist of an extension of the laboratory program of PHB316 together with experimental radiation physics & a project performed either individually or in a small group. The project will occupy approximately 6 weeks.

**PHB501 Applied Quantum Mechanics**

3 hr/wk; ASJ226, A; Pre: PHB310(R) & MAB401 & MAB402; Pre for: PHB601

A course of lectures on quantum mechanics & theory of spectra.

**PHB502 Electromagnetic Field Theory**

3 hr/wk; ASJ226; A; Pre: PHB310(R) & MAB401 & MAB402

A course of lectures on electromagnetic field theory. Includes static field theory, wave equation, plane & spherical wave solutions, properties of plane waves, reflection, refraction, wave guides, cavity resonators & radiation theory.

**PHB508 Electronics III**

3 hr/wk; ASJ226, CHJ129; A; Pre: PHB408; Pre for: CHB618

A program of lectures & laboratory work covering micro-processor fundamentals & interfacing to computers, displays & instrumentation. Design of microprocessor controlled data collection & analysis systems.

**PHB510 Physical Methods of Analysis I**

3 hr/wk; ASJ226; A; Pre: PHB410

A course of lectures & associated practical work on a range of physical techniques of analysis, including for example x-ray diffraction, electron microscopy. Emphasis is on the physical principle, instrumentation & nature of information available from each techniques. Industrial visits may be included.

**PHB511 Physical Methods of Analysis II**

3 hr/wk; ASJ226; A; Pre: as for PHB510

A course of lectures & associated practical work on a range of physical techniques of analysis, including for example electron microprobe analysis, neutron activation analysis, infrared spectroscopy & mass spectroscopy. Emphasis is on the physical principle, instrumentation & nature of information available from each technique. Industrial visits may be included.

**PHB516 Experimental Physics V**

6 hr/wk; ASJ226; A; Pre: PHB416; Co: at least one third level PH unit

Laboratory & field work in applied physics with emphasis on open ended experiments with modern equipment. Field trips may be necessary.

**PHB601 Solid State Physics**

3 hr/wk; ASJ226; S; Pre: PHB401 & PHB501

A course of lectures on the physics of materials, including mechanical, thermal & electrical properties.

**PHB602 Nuclear Physics & Energy**

3 hr/wk; ASJ226; S; Pre: PHB402

A course of lectures on applied nuclear physics, neutron physics, reactor technology & energy.

**PHB608 Applied Acoustics**

3 hr/wk; ASJ226; S; Pre: PHB311

A course of 15 lectures & associated practical work. Standards, principles of methods & instrumentation used in vibration, noise & sound measurements with emphasis upon architectural acoustics & traffic, industrial & community noise. Brief treatment of underwater acoustics & recording & reproduction of sound. Legal & technical aspects of professional practice. Field trips.

**PHB609 Applied Radiation Physics**

3 hr/wk; ASJ226; S; Pre: PHB402

A course of 15 lectures & associated laboratory work covering special techniques of radiation counting & applications, health physics, radiation protection, & radiobiological effects.

**PHB611 Astronomy**

3 hr/wk; ASJ226; S; Pre: PHB110 & PHB111 & PHB210 & PHB211

A course of study dealing with astronomical coordinate systems, time systems, astronomical instruments, celestial mechanics & gravitation, the solar system, stellar measurements & stars.

Practical work involves analysing photographs, reduction of the resulting data & the analysis of recorded data. Observational sessions are held if weather permits.

**PHB613 Biophysics**

3 hr/wk; ASJ226; S; Pre: At least 9 hr first level physics subjects & successful completion of at least 30 hours of second level subjects.

A course dealing with the biophysics of selected biological systems (e.g. electrical transmission systems, amplifiers, mechanical systems, molecular behaviours in fields) & instrumentation for inter-cellular & inter-organ measurements (micro-electronics, transducers, etc.).

**PHB615 Science Education**

3 hr/wk; ASJ226; S; Pre: as for PHB613

Consideration of the implementation & application of various instruments utilised in science education. Assessment of the relative apparent benefits of the use of these instruments. Field trips may be necessary.

**PHB616 Project**

9 hr/wk; ASJ226; A/S; Pre: PHB516; Co: At least one third level PH unit

A supervised project on some aspect of applied physics which could involve the extension & application of existing techniques or the development of new techniques.

**PHB617 Science & Society**

3 hr/wk; ASJ226; S; Pre: as for PHB613

This course examines the innovative role of technology as a link between science & human society, including historical aspects, environmental & energy considerations, innovation rate & behavioural modifications linked to technology.

**PHB620 Topics in Physics**

3 hr/wk; ASJ226; S; Pre: At least 12 hrs Level 2 PH subjects

Lectures, laboratory work & industrial visits in several topics relating to current advances in Physics. The nature of the subject will depend on departmental & staff activities at the time.

**PHD172 Radiographic Physics I**

4 hr/wk; PHK205, PHK206; A; Pre for: PHD282, PHD472, PHD474

A theoretical & practical unit dealing with the principles & concepts of physics necessary for understanding material treated throughout the radiography courses. The unit deals with electricity, magnetism, properties of matter, radiation & the interaction of radiation with matter; emphasis is placed on relevance to radiography.

**PHD173 Radiographic Technique I**

3.5 hr/wk; PHK205; A; Pre for: PHD277

A theoretical unit dealing with patient care & positioning to produce radiographs which will demonstrate any abnormalities. The unit also deals with the relevant exposure factors; the use of accessory positioning aids. Procedures for limbs, vertebral column, pelvis, skull, chest, urinary tract & abdomen.

**PHD174 Radiographic Equipment I**

2 hr/wk; PHK205; A; Pre for: PHD474

An introductory unit adopting a whole device approach to x-ray generators & ancillary equipment used in diagnostic radiography.

**PHD175 Radiographic Processing**

2 hr/wk; PHK205; A

The principles & practices involved in obtaining a visible image in radiography are considered. The photographic process, processing, materials, techniques & equipment relevant to radiography are discussed.

**PHD177 Radiographic Practice I**

3.5 hr/wk; PHK205; A; Pre for: PHD277

A series of practical exercises designed to complement the theoretical material presented in PHD173.

**PHD186 Radiotherapy Practice I**

6 hr/wk; PHK206; Pre for: PHD287, PHD286

An introductory unit dealing with beam directing devices, wedges, isodosing & pertinent mathematics.

**PHD188 Principles of Pathology**

2 hr/wk; PHK206; A

An introductory unit dealing with elementary pathology, the biological effects & clinical aspects of radiation.

PHD277 Clinical Practice ID

16 hr/wk; PHK205; S; Pre: PND110 & PHD173 & PHD177; Pre for: PHD377

Practical programs carried out in approved clinical training centres under the supervision of qualified radiographers & radiologists. Detailed programs for each semester are specified by a Clinical Practice Supervisory Committee.

PHD282 Radiotherapy Physics I

4 hr/wk; PHK206; S; Pre: PHD172; Pre for: PHD382

Detailed discussion of therapeutic x-ray generator components, the equipment & principles of megavoltage & telecuric therapy & rotation therapy, dose distribution calculation.

PHD286 Radiotherapy Practice II

3 hr/wk; PHK206; S; Pre: PHD186; Pre for: PHD384

Detailed consideration of planning procedures & principles, including mathematical & technical applications.

PHD287 Clinical Practice IT

12 hr/wk; PHK206; Pre: PND110 & PHD186; Pre for: PHD487

Practical programs carried out in approved clinical training centres under the supervision of qualified radiographers & radiation oncologists. Detailed programs for each semester are specified by a Clinical Practice Supervisory Committee.

PHD288 Tumour Pathology

0.7 hr/wk; PHK206; S; Pre: PND110

An introduction to aetiology, incidence, classification & metastasis of tumours of man.

PHD310 Radiographic Technology

1 hr/wk; PHK205; A

A subject designed to make students aware of x-ray technology & safety aspects of radiography as employed in the clinical situation. No formal lecture classes are required. Assignments must be submitted on topics specified within the areas of x-ray apparatus design & performance characteristics; radiological health & safety.

PHD377 Clinical Practice IID

16 hr/wk; PHK205; A; Pre: PHD277; Pre for: PHD473, PHD477

Practical programs carried out in approved clinical training centres under the supervision of qualified radiographers & radiologists. Detailed programs for each semester are specified by a Clinical Practice Supervisory Committee.

PHD382 Radiotherapy Physics II

3 hr/wk; PHK206; Pre: PHD282; Pre for: PHD486

Measurement & dosimetry of external beam x-ray & gamma-radiation relevant to radiotherapy. Technical aspects of sealed radioactive materials used in radiotherapy. Protection relevant to therapeutic radiography.

PHD383 Principles of Treatment I  
2.5 hr/wk; PHK206; A; Pre for: PHD485

After consideration of biological & physical principles, the treatment of cancer at various sites in the body is discussed in detail.

PHD384 Radiotherapy Practice III  
3 hr/wk; PHK206; A; Pre: PHD286; Pre for: PHD486

This unit covers full details of techniques & procedures used in treatment with emphasis on practical considerations.

PHD387 Clinical Practice IIT  
11 hr/wk; PHK206; A; Pre for: PHD487

Practical programs carried out in approved clinical training centres under the supervision of qualified radiographers & radiation oncologists. Detailed programs for each semester are specified by a Clinical Practice Supervisory Committee.

PHD471 Radiobiology & Protection  
2 hr/wk; PHK205, PHK206; S

This unit treats aspects of radiobiology necessary for an appreciation of the philosophy & protocol of radiation protection. The question of protection is treated in a manner which brings into perspective the many details of protection dealt with throughout other units of the diagnostic radiography course.

PHD472 Radiographic Physics II  
2 hr/wk; PHK205; S; Pre: PHD172

This unit extends the treatment of principles & concepts of physics necessary for diagnostic radiography students. Image evaluation & information theory.

PHD473 Radiographic Technique II  
3 hr/wk; PHK205; S; Pre: PHD377; Pre for: PHD573, PHD577

This unit amplifies the material presented in PHD173 & PHD177 in relation to the more extensive preparation & techniques for specialised radiographic procedures. Attention is given to the anatomical & physiological basis of radiographic procedures. Students are made familiar with radiographic appearances, both of the normal subject & of common abnormal conditions where elementary knowledge of the pathology involved will ensure the application of the appropriate radiographic techniques.

PHD474 Radiographic Equipment II  
5 hr/wk; PHK205; S; Pre: PHD172 & PHD174; Pre for: PHD574

Detailed discussion of design, rating & circuitry of x-ray generator component; equipment used for beam collimation; reduction of scatter; mobile units; basic electronics.

**PHD475 Ultrasonics**

2 hr/wk; PHK205; S

This unit introduces radiography students to the basic physical principles & clinical applications of high frequency mechanical waves. Major emphasis will be placed on basic physics of generation, detection, measurement, interaction processes; state of the art 'technology & instrumentation'; clinical scanning techniques, tomographic versus orthographic imaging; sonobiology & exposimetry; equipment, calibration & performance assessment.

**PHD477 Radiographic Practice II**

2 hr/wk; PHK205; S; Pre: PHD377; Pre for: PHD573, PHD577

A series of practical exercises designed to complement the theoretical material presented in PHD473.

**PHD485 Principles of Treatment II**

2 hr/wk; PHK206; S; Pre: PHD383; Pre for: PHD586

A continuation of the detailed discussion started in PHD383.

**PHD486 Radiotherapy Practice IV**

3 hr/wk; PHK206; S; Pre: PHD382 & PHD384; Pre for: PHD586

This unit covers full details of techniques & procedures used in treatment with emphasis on practical considerations.

**PHD487 Clinical Practice IIIT**

12 hr/wk; PHK206; S; Pre: PHD287 & PHD387; Pre for: PHD587

Practical programs carried out in approved clinical training centres under the supervision of qualified radiographers & radiotherapists. Detailed programs for each semester are specified by a Clinical Practice Supervisory Committee.

**PHD572 Complementary Imaging Techniques**

4 hr/wk; PHK205; A

This unit treats a number of topics which are complementary to diagnostic radiography & others in the fields of image presentation & evaluation, which are of potential importance in diagnostic radiography. Includes CT, MRI, nuclear medicine & computers.

**PHD573 Radiographic Technique III**

3 hr/wk; PHK205; A; Pre: PHD473 & PHD477; Pre for: PHD677

This section amplifies PHD473 in relation to the more extensive preparation & techniques for specialised radiographic procedures.

**PHD574 Radiographic Equipment III**

3 hr/wk; PHK205; A; Pre: PHD474

This unit covers the technology of x-ray equipment & its correct use in advanced radiographic techniques. Quality control & fault conditions.

**PHD577 Clinical Practice IIID**

10 hr/wk; PHK205; A; Pre: PHD473 & PHD477; Pre for: PHD677

Practical programs carried out in approved clinical training centres under the supervision of qualified radiographers & radiologists. Detailed programs for each semester are specified by a Clinical Practice Supervisory Committee.

**PHD580 Complementary & Evolving Techniques I**

4 hr/wk; PHK206; A

Consideration of specific imaging modalities used in treatment planning or cancer diagnosis.

**PHD586 Radiotherapy Practice V**

3 hr/wk; PHK206; A; Pre: PHD485 & PHD486

This unit covers details of techniques & procedures used in treatment with emphasis on practical considerations.

**PHD587 Clinical Practice IVT**

13 hr/wk; PHK206; A; Pre: PHD487; Pre for: PHD687

Practical programs carried out in approved clinical training centres under the supervision of qualified radiographers & radiation oncologists. Detailed programs for each semester are specified by a Clinical Practice Supervisory Committee.

**PHD610 Advanced Radiographic Technique**

2 hr/wk; PHK205; S

Assignments must be submitted on topics specified with the areas of modern trends in x-radiographic technique; computerised tomography scanners; digital radiography; nuclear medicine imaging apparatus & other complementary imaging modalities. No formal lecture classes are required.

**PHD677 Clinical Practice IVD**

16 hr/wk; PHK205; S; Pre: PHD573 & PHD577

Practical programs carried out in approved clinical training centres under the supervision of qualified radiographers & radiologists. Detailed programs for each semester are specified by a Clinical Practice Supervisory Committee.

**PHD680 Complementary & Evolving Techniques II**

3 hr/wk; PHK206; S

Applications of the computer to radiotherapy planning. Consideration of the principles & merits of evolving techniques.

**PHD687 Clinical Practice VT**

16 hr/wk; PHK206; S; Pre: PHD587

Practical programs carried out in approved clinical training centres under the supervision of qualified radiographers & radiation oncologists. Detailed programs for each semester are specified by a Clinical Practice Supervisory Committee.

**PHN101 Analog Electronics**

2 hr/wk; PHN176; A

Principles of electronics applicable in the medical field; discrete circuits & integrated circuits in common use - design & limitations.

**PHN102 Introduction to Medical Computing**

1 hr/wk; PHN176; A

Basic concepts of computing systems, programming, software engineering, introduction to medical applications.

**PHN103 Radiation Physics**

4 hr/wk; PHN176; A

Deals with phenomena related to interaction of ionising radiation with matter. Emphasis on aspects of actual or potential importance in a clinical environment. Isotope production, nuclear radiation detectors.

**PHN116 Professional Experience Tour**

1 hr/wk; PHN176; A

A study tour of medical physics facilities to introduce new students to the range of activities & meet professional practitioners.

**PHN150 Optics**

2 hr/wk; CHN217; S; Pre for: CHN510

The objective of this subject is to provide understanding & knowledge of fundamental optical theory & its application to optical instruments used in spectroscopy.

Optical materials & devices - spectral ranges; diffraction gratings; spectrographs; spectrometers; monochromators; spectrophotometers; special purpose instruments; lasers & their applications; optimum illumination; reduction of scattered light; Fourier spectroscopy & grille spectrometers; manufacturer's specifications.

**PHN201 Administration & Budgeting**

1 hr/wk; PHN176; A

Concepts of planning, organising, staffing, directing & controlling. Includes Hospital visits to observe management procedures.

**PHN202 Biomechanics**

3 hr/wk; PHN176; A

Study of mechanical principles & properties related to human tissues & physiological functions with emphasis on work ergonomics & occupational health measurement problems.

**PHN203 Radiobiology & Genetics**

2 hr/wk; PHN176; A

A comprehensive study of the interaction of ionising radiation with biological material with particular emphasis on mammalian

cells & systems. The philosophy & techniques associated with radiation protection. Radiation genetics & man - ICRP recommendations.

**PHN204 Safety & Occupational Health**  
1 hr/wk; PHN176; A

Deals with philosophy, protocol & practices necessary to minimise hazards associated with electrical, mechanical & biological techniques used in hospitals.

**PHN205 Radiation Health Physics**  
2 hr/wk; PHN176; A

Study of principles & techniques of dosimetry of ionising radiation with emphasis on aspects pertinent to actual or potential use in medicine.

**PHN301 Digital Electronics**  
3 hr/wk; PHN176; S

Basic digital integrated circuits & their applications in logic design & microprocessor interfacing. Microprocessor programming & applications. Integrated with Instrumentation & Medical Imaging Science to develop an understanding of micro-computer function & applications.

**PHN302 Instrumentation**  
2 hr/wk; PHN176; S

This subject concentrates on gaining experience in the use of a wide range of instrumentation. Topics included are generalised instrument, data transfer, data interpretation, servomechanisms, data recorders, systems, practical aspects of instrument use. Laboratory learning experience in the gathering, conditioning, storage & analysis of data, using skills learned in digital electronics, computing & instrumentation.

**PHN303 Medical Signal & Data Analysis**  
2 hr/wk; PHN176; S

Digital signal processing of physiological signals, digital image processing, medical applications of numerical methods & medical statistics.

**PHN304 Medical Imaging Science**  
2 hr/wk; PHN176; S

Visual science, analog & digital images, image enhancement, restoration & analysis, computed tomography, computer architectures, display instrumentation, recording & storage.

**PHN316 Professional Experience Attachment**  
1 hr/wk; PHN176; S

A two to three week program of full-time attachment & clinical visits to a medical physics facility or other relevant institution to gain experience by observation & limited participation in the activities of the host organisation.

**PHN350 Electronics**

2 hr/wk; CHN217; A; Pre for: CHN445

The purpose of the subject is to acquaint students with the basic principles associated with using modern high technology devices.

Basic characteristics of PN junction diodes & their applications in power supplies. Transistor types. Operational amplifiers, linear integrated circuit applications, common mode rejection. Transistors as switches, multivibrators, decimal counters, binary codes. ASCII code, 7 segment displays, logic gates, flip-flops, analog to digital conversion & applications. Electronic circuit applications in modern chemical instrumentation.

**PHN401 Nuclear Medicine**

2 hr/wk; PHN176; S

Introduction to the principles & techniques of the handling, preparation & clinical use of unsealed radioisotopes. Includes in vivo, in vitro diagnostic tests & imaging instrumentation.

**PHN402 Radiotherapy**

2 hr/wk; PHN176; S

Considers the principles & techniques of clinical application of ionising radiation for diagnostic & therapeutic purposes. Emphasis is on radiotherapy physics & diagnostic x-rays.

**PHN403 Diagnostic Radiology**

1 hr/wk; PHN176; S

Principles & technology of diagnostic x-ray imaging. Production & control of x-ray beam parameters, imaging methods & diagnostic procedures are outlined & practical work performed to test function & output quality of x-ray units.

**PHN404 Ultrasound & Non-Ionising Radiation**

2 hr/wk; PHN176; S

Discussion of principles & techniques of using non-ionising electromagnetic, ultrasonic & other radiation for medical purposes. Dosimetry & hazards are included.

**PHN405 Physiological Measurement**

2 hr/wk; PHN176; S

Introduction to the principles & techniques of the direct & indirect measurement of physiological variables.

**PHN416 Professional Experience Attachment**

1 hr/wk; PHN176; S

A two to three week program of full-time attachment & clinical visits to a medical physics facility or other relevant institution to gain experience by observation & limited participation in the activities of the host organisation.

PHN520 Medical Physics V  
18 hr/wk; PHN176 (full-time students); A/S

PHN540 Medical Physics V  
9 hr/wk; PHN176 (part-time students); A/S

Professional Practice & Case Studies:

Experience in real medical physics situations & problem-solving by attachment & visits to medical physics groups, external as well as internal to the Queensland Institute of Technology.

Project:

The project may take the form of research development, a design, a feasibility study, or the collation of scattered information on a given topic. The project could be undertaken externally under Queensland Institute of Technology supervision. Time spent on projects will be variable & spread over more than one semester.

## PUBLIC HEALTH & NUTRITION

PNB165 Physiology II  
4 hr/wk; ASJ226; S; Co: CHB201; Inc: PNB231; Pre for: PNB465  
(consult strand coordinator)

A course of lectures & practicals. Basic Mechanisms - cells, fluids, electrolytes; energy metabolism; essential nutrients; transport mechanisms; blood; communication & control; excitable tissues. Control Systems - nervous & endocrine systems. This subject must be taken by students wishing to study Nutrition electives.

PNB231 Anatomy & Physiology I  
4 hr/wk; ASJ226; A/S; Inc: PNB165; Pre for: MSB412, PNB232

This subject will introduce students to an integrated study of anatomy & physiology at the degree level. Emphasis will be placed on gaining an appreciation of the relationship between structure & function at the levels of cells, tissues, organs & organ systems. Initially the morphology & physiology of cells & tissues will be examined. Metabolism, nutrition & temperature regulation will be reviewed & then the skeletal, muscular, nervous & integumentary systems will be studied.

PNB232 Anatomy & Physiology II  
4 hr/wk; ASJ226; A/S; Pre: PNB231; Inc: PNB465

The broad objectives outlined in PNB231 will be continued. Emphasis in this subject will be focused on structure-function relationships at the level of organs & systems. The cardiovascular, lymphatic, respiratory, digestive, urino-genital, & endocrine systems will be studied. A review of the actions of drugs on cells, tissues, organs & systems will be given at the end of the subject.

**PNB305 Human Nutrition I**

3 hr/wk; ASJ226; A; Pre: PNB165; Co: MSB415 & PNB465

This subject builds on student's foundations in physiology to gain an appreciation of the meaning of nutrition, of methods used in its study, of food as a source of nutrients, of the nutritional impact of technology & other aspects of the subject.

**PNB405 Human Nutrition II**

3 hr/wk; ASJ226; S; Pre: PNB305

An extension of PNB305 to allow for further study of the role of the nutrients in the maintenance of life, growth & the normal function of the human body. Topics covered will include the nature & function of the different nutrients, primary nutritional diseases, as well as nutrition in the community.

**PNB465 Physiology III**

4 hr/wk; ASJ226; A; Pre: PNB165; Inc: PNB232 (consult strand coordinator)

A course of lectures & practicals. Maintenance Systems - gastrointestinal; cardiovascular; respiratory; & renal systems. Integrated mechanisms - sexual development; pregnancy; parturition; lactation; control of growth, energy intake, organic metabolism, body temperature, ECF osmolarity & volume, major cations, blood pressure & flow, respiration; response to tissue damage & foreign matter; adaptation to stress & exercise. This subject must be taken by students wishing to study Nutrition electives.

**PND110 Anatomy & Physiology**

7.5 hr/wk; PHK205, PHK206; A; Pre for: PHD277, PND411, PHD288, PHD287

This unit deals with normal human anatomy & physiology. The unit is structured into a core component of human anatomy & physiology common to students in Diagnostic Radiography & Therapeutic Radiography courses. Diagnostic Radiography students receive additional material on osteology & Therapeutic Radiography students receive additional material on physiology.

**PND411 Applied Radiographic Anatomy**

2 hr/wk; PHK205; S; Pre: PND110

This unit deals with the normal & abnormal appearances on radiographs; variations in accepted techniques to demonstrate suspected pathological changes. Cross-sectional anatomy.

**PNN161 Anatomy & Physiology I**

3 hr/wk; PHN176; A

A study of basic functional anatomy covering cells, tissues, & the organ systems of the human body. The lectures & practical work are integrated & emphasise the relationships between structure & function.

**PNN165 Anatomy & Physiology II**  
3 hr/wk; PHN176; S

A study of the mechanisms & controls of body functions. Stress is placed on fundamental principles & the practical work serves to illustrate these principles, as well as providing experience in physiological recording & investigative techniques.

## **SURVEYING**

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**SVB303 Surveying for Geologists**  
3 hr/wk; ESJ132; A; Pre for: ESB563

Theories of surface & sub-surface surveying techniques, their application & practice. The principles of photogrammetry & photointerpretation.

