

# FACULTY OF SCIENCE

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# FACULTY OF SCIENCE

## Course Structures

### ■ Master of Applied Science (SC80)

**Location:** Gardens Point campus

**Course Duration:** 2 years full-time, 4 years part-time

**Total Credit Points:** 192

**Entry Requirement:** Bachelor of Applied Science

The objectives of this course are:

- 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
- to provide further education in research methods
- to enable graduates employed in industry to undertake further education by research and thesis
- to enable industrial organisations and other external agencies to sponsor a student research program under the control and supervision of the faculty, and thus to further relationships between the University and industry or other external agencies engaged in applied science, to their mutual advantage.

This degree consists of two stages:

Stage One comprises a program of assessed coursework. (Honours graduates may be exempt from Stage One.)

On successful completion of Stage One, students with a GPA of less than 5.0 will be awarded a Graduate Diploma in Applied Science while students with a GPA of 5.0 or greater are permitted to continue to stage Two.

In Stage Two, students are required to undertake a program of supervised research and investigation at a level of scientific competence significantly higher than that expected of a first degree graduate. Students can undertake an approved project in any area of interest supported by a research centre, research concentration or School within the Faculty of Science.

#### 1. General Conditions

1.1 The Council of the Queensland University of Technology was established in 1989 under the Queensland University of Technology Act 1988.

1.2 The Council's power to approve recommendations from faculty academic boards regarding the registration, supervision and examination of research degree candidates and to develop policy and procedure relating to research degrees is exercised through a Research Management Committee which shall be a subcommittee of Academic Committee.

1.3 Research Management Committee has delegated responsibility for day-to-day administration of research master degree courses to faculty academic boards. Academic

boards shall report biannually to the Research Management Committee on progress made by research master degree candidates.

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

1.5 In order to qualify for the award of the degree of Master of Applied Science, a candidate must:

- have completed the approved course of study under the supervision prescribed by the Academic Board
- have submitted, and the Academic Board have accepted, a thesis prepared under the supervision of the supervisor
- have completed any other work prescribed by the Academic Board, and
- submit to the Academic Board a declaration signed by the candidate that he/she has not been a candidate for another tertiary award without permission of the Academic Board during the term of enrolment.

## **2. Registration**

2.1 Applications shall be accepted subject to the availability of facilities and supervision.

2.2 Applications may be lodged with the Registrar at any time.

2.3 The minimum academic qualifications for admission to a program leading to a Master of Applied Science, shall be:

- possession of a bachelor degree in applied science from the Queensland University of Technology, or
- possession of an equivalent qualification, or
- submission of such other evidence of qualifications as will satisfy the Academic Board that the applicant possesses the capacity to pursue the course of study.

2.4 Additional requirements for admission to a particular program may be laid down by the Academic Board.

2.5 In considering an applicant for registration the Academic Board shall, in addition to assessing the applicant's suitability, assess the proposed program and its relevance to the aims and objectives of the University.

2.6 A candidate may register either as a full-time or as a part-time student.

2.6.1 To be registered as a full-time student, a candidate must be able to commit to the course not less than three-quarters of a normal working week, averaged over each year of candidacy. Such a student may not devote more than 300 hours annually to teaching activities, including preparation and marking.

2.6.2 A candidate who is unable to devote to the course the proportion of time specified in Section 2.6.1 may register as a part-time student.

2.7 A candidate may be internal or external. An external candidate is one whose program of research and investigation is based at a place of employment or sponsoring institution. Normally, support of the sponsoring institution for the candidate's application is required for registration.

2.8 A candidate shall be registered initially in Stage 1 of the course unless exemption has been obtained (see 3.7 below).

2.9 The Academic Board may cancel a candidate's registration if, after consulting a candidate's supervisors and having taken account of all relevant circumstances, the

Academic Board is of the opinion that the candidate either has effectively discontinued his/her studies or has no reasonable expectation of completing the course of study within the maximum time allowed (see Section 4).

2.10 A candidate whose registration has lapsed or has been cancelled and who wishes subsequently to re-enter the course to undertake a research program which is the same or essentially the same as the previous program may be re-admitted under such conditions as the Academic Board may prescribe.

### **3. Course of Study**

3.1 A candidate for the degree of Master of Applied Science shall undertake a program of research and investigation on a topic approved by the Academic Board. All projects should be sponsored either by outside agencies such as industry, government authorities, or professional organisations, or by the University itself.

3.2 The program must be such as to enable the candidate to develop and demonstrate a level of scientific competence significantly higher than that expected of a first degree graduate. The required competence normally would include mastery of relevant techniques, investigatory skills, critical thinking, and a high level of knowledge in the specialist area.

3.3 The program consists of two parts, Stage 1 and Stage 2. Progression to Stage 2 is dependent on satisfactory completion of Stage 1 or special permission from the Academic Board. Stage 1 comprises a program of assessed coursework as defined in 3.4 and 3.5 as appropriate for each candidate. Stage 2 comprises a program of supervised research and investigation as indicated in 3.1 and 3.2.

3.4 Coursework at master level may be conducted in a number of ways such as:

- advanced lecture courses
- seminars in which faculty and students present critical studies of selected problems within the subject field
- independent study or reading courses, or
- research projects conducted under faculty supervision.

In all cases, coursework is based upon a formal syllabus setting out the educational outcomes expected from the course, a list of topics to be covered, the prescribed reading material and the method of assessment of progress through and at the end of the course.

3.5 A candidate shall be required to participate in and present seminars as considered appropriate by the Principal Supervisor. The candidate shall be notified of minimum attendance requirements at the time of acceptance of enrolment.

3.6 Stage 1 will normally occupy not more than half of the total period of registration and not more than 96 credit points.

3.7 Students entering the course with an honours degree or its equivalent or candidates with substantial relevant work experience normally gain exemption from most or all of Stage 1 at the discretion of the Academic Board on the recommendation of the Head of School.

3.8 An application for registration should set out systematically and fully the candidate's intended course of study. The description should include the area of study within which the candidate's course lies, the coursework to be undertaken, the proposed title of the thesis to be written, the aim of the proposed program of research and investigation, its background, the significance and possible application of the research program, and the research plan.

#### **4. Period of Time for Completion of Course of Study**

4.1 A full-time candidate who does not hold an honours degree appropriate to the course of study will normally be required to complete both Stage 1 and Stage 2, including submission of the thesis for examination as required in Stage 2, during a period of registration of 24 months. The corresponding period in the case of a part-time candidate shall be 48 months. In special cases the Academic Board may approve a shorter period.

4.2 On successful completion of Stage 1 (96 credit points):

- (i) students with GPA <5 will normally graduate with a GradDipAppSc while
- (ii) students with GPA >5 will be permitted to:
  - (a) graduate as above, or
  - (b) continue with Stage 2 (which is a further one year full-time or equivalent) involving a project leading to the award MAppSc.

4.3 A holder of an honours degree appropriate to the course of study may submit the thesis for examination after not less than 12 months of registration in Stage 2 if a full-time student, or 24 months if a part-time student. Exemption from all or part of Stage 1 may be granted as indicated in 3.7 above. In special cases the Academic Board may approve a shorter period.

4.4 Where application is made for permission to extend the period within which the candidate may submit a thesis for examination, details of the candidate's progress shall be presented to the Academic Board together with the reasons for the delay in completing the work and the expected date of completion. Where the Academic Board agrees to an extension, it may set a limit to the maximum period of registration in the program.

#### **5. Transfer of Registration**

5.1 Where a candidate has undertaken part of a proposed course of study as a registered student in another institution, this period of registration may, on application in writing to the Academic Board at the time of application for registration, be counted towards the candidate's period of registration in the QUT course. The application must include details of the work already undertaken, the reasons for the transfer and the expected date of completion.

5.2 Applications for transfer normally should be submitted at least 12 months in advance of the probable date of submission of the thesis.

#### **6. Supervision**

6.1 For each candidate the Academic Board 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 the others as Associate Supervisors.

6.2 In the case of an internal student, the Principal Supervisor normally shall be from the academic staff of the school where the student carries out the work.

6.3 In the case of an external student, the Principal Supervisor normally shall be from the academic staff of the school supporting the work and at least one Associate Supervisor shall be from the sponsoring organisation.

6.4 At the end of each six-month period a student shall submit a report on the work undertaken to the Principal Supervisor and the Principal Supervisor shall submit a report to the Academic Board on the student's work. This report shall be seen by the candidate before submission to the Academic Board.

## 7. Place and Conditions of Work

7.1 The research program must normally be carried out under supervision in a suitable environment in Australia.

7.2 The Academic Board shall not admit a candidate to undertake a program of research based at the University unless it has received a statement from the Head of School and/or the Director of the Centre in which the study is proposed that, in their opinion, the applicant is a fit person to undertake a research program leading to the master degree, that the program is supported, and that the School/Centre is willing to undertake the responsibility of supervising the applicant's work.

7.3 The Academic Board shall not admit a candidate to undertake a research program based at a sponsoring establishment unless it has received:

- 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 they are willing to accept responsibility for supervising the applicant's work, and
- a statement from the Head of School or the Director of the Centre in which the study is proposed that, in their opinion, the applicant is a fit person to undertake a research program leading to the master degree, that the program is supported, and that after examination of the proposed external facilities and supervision, the school is willing to accept the responsibility of supervising the work.

## 8. Thesis

8.1 In the form of presentation, availability and copyright, the thesis shall comply with the provisions of the document *Requirements for Presenting Theses*.

8.2 Not later than six months after commencement of Stage 2 the candidate shall submit the title of the thesis for approval by the Academic Board. After approval has been granted, no change shall be made except with the permission of the Academic Board.

8.3 The candidate shall give two months' notice of intention to submit the thesis. Such notice shall be accompanied by the appropriate fee, if any.

8.4 The thesis shall comply with the following requirements:

- a significant portion of the work described must have been carried out subsequent to initial registration for the degree
- 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
- it must reach a satisfactory standard of literary presentation
- it shall be the candidate's own account of the work. Where work is carried out jointly with other persons, the academic board shall be advised of the extent of the candidate's contribution to the joint work
- 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
- supporting documents, such as published papers, may be submitted with the thesis if they have a bearing on the subject of the thesis, and
- the thesis shall contain an abstract of not more than 300 words.

8.5 Except with the specific permission of the Academic Board the thesis must be presented in the English language. Such permission must be sought at the time of application for registration, and will not be granted solely on the grounds that the

candidate's ability to satisfy the examiners will be affected adversely by the requirement to present the thesis in English.

8.6 Subject to QUT's Intellectual Property policy, the copyright of the thesis is vested in the candidate.

8.7 Where a candidate or the sponsoring establishment wishes the thesis to remain confidential for a period of time after completion of the work, application for approval must be made to the Academic Board when the thesis is submitted. The period of confidentiality normally shall not exceed two years from the date on which the examiners recommend acceptance of the thesis, during which time the thesis will be held on restricted access in the QUT Library.

## **9. Examination of Thesis**

9.1 The Academic Board shall appoint at least two examiners, of whom at least one shall be from outside the University. Normally examiners will be required to agree to read and report upon the thesis within two months of its receipt.

9.2 A candidate may be required to make an oral defence of the thesis.

9.3 On receipt of satisfactory reports from the examiners, and when the provisions of 7.1 have been fulfilled, the Academic Board shall recommend to Academic Committee that the candidate be awarded the degree.

9.4 If the examiners' reports are conflicting, the Academic Board may, after appropriate consultation with the Principal Supervisor, seek advice from a further external examiner.

9.5 If, on the basis of the examiners' reports, the Academic Board does not recommend that the degree be awarded then it shall:

- permit the student to resubmit the thesis within one year for re-examination, or
- cancel the student's registration.

## **■ Master of Applied Science (Medical Physics), Master of Applied Science (Medical Ultrasound) (PH80)**

**Location:** Gardens Point campus

**Course Duration:** 2 years full-time, 4 years part-time (plus Summer School)

**Total Credit Points:** Medical Physics (192) Medical Ultrasound (204)

**Standard Credit Points/Full-Time Semester:** 48

### **Course Coordinators:**

Medical Physics Major – Dr Timothy van Doorn

Medical Ultrasound Major – Associate Professor Brian Thomas

**Assistant Coordinator:** Medical Ultrasound Major – Ms Margo Harkness

### **Entry Requirements**

#### **MEDICAL PHYSICS MAJOR**

To be eligible to enrol for the Medical Physics Major, 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, School of Physics. In some instances, a bridging program may be necessary.

#### MEDICAL ULTRASOUND MAJOR

To be eligible to enrol in the Medical Ultrasound Major, an applicant will normally be qualified as a diagnostic radiographer (or medical imaging technologist) at degree or diploma level and have had a minimum of two years' experience as a practising radiographer.

Applicants with other qualifications (eg. in paramedical or physical sciences), or with other appropriate experience, may be permitted to enrol subject to the approval of the Head of the School of Physics. In some instances, a bridging program may be necessary.

Applicants must also demonstrate, in writing, that access to suitable clinical experience will be available for the duration of the course.

#### Course Requirements

##### MEDICAL PHYSICS MAJOR

To complete Stage 1, students must complete units selected from the list below, totalling 96 credit points. Units LSN158, PHN155, PHN156, PHN157, PHN257, PHN352, PHN354, PHN357 are not available to students in the Medical Physics Major. PHN151, PHN154, PHN351 and PHN353 are not recommended to students in the Medical Physics Major.

##### MEDICAL ULTRASOUND MAJOR

To complete Stage 1, students must complete units selected from the list below, totalling 108 credit points. Units PHN157, PHN257 and PHN357 are compulsory for students in the Medical Ultrasound Major. Unit PHN402 is not available to students in the Medical Ultrasound Major.

On successful completion of Stage 1 of either major:

- (i) students with GPA <5 will normally graduate with a GradDipAppSc (Medical Physics or Medical Ultrasound); (however, the Head of School may grant permission for such students to continue to Stage 2); while
- (ii) students with GPA >5 will be permitted to:
  - (a) graduate as above, or
  - (b) continue with Stage 2 (which is a further one-year full-time or equivalent) involving a project leading to the award MAppSc.

#### Stage 1

		Credit Points	Contact Hrs/Wk
<b>First Semester</b>			
LSX125	Anatomy & Physiology 1	6	2
PHN101	Analogue Electronics	6	2
PHN102	Introduction to Medical Statistics & Computing	6	2
PHN103	Radiation Physics 1	6	2
PHN104	Radiation Physics 2	8	3
PHN202	Biomechanics	8	3
PHN204	Health & Occupational Physics	8	3
PHN206	Medical Imaging	8	3
PHN351	Ultrasound Equipment 2	6	2
PHN352	Ultrasonic Examination in Cardiology	6	2
PHN353	Ultrasound in Medical Diagnosis	6	2

PHN354	Ultrasonic Examinations of the Head, Neck & Peripheral Organs	6	2
PHN357	Clinical Ultrasound 3*	12	
PHN407	Case Studies*	6	

### Second Semester

LSN158	Ultrasonic Pathology	6	2
LSX225	Anatomy & Physiology 2	8	3
PHN152	Cross-sectional Anatomy	6	2
PHN153	Ultrasound Equipment 1	6	2
PHN154	Principles of Ultrasound Imaging	6	2
PHN155	Ultrasonic Examination in Obstetrics/Gynaecology	6	2
PHN156	Ultrasonic Examination of the Abdomen	6	2
PHN157	Clinical Ultrasound 1*	12	
PHN301	Microprocessors	8	3
PHN302	Instrumentation	8	3
PHN304	Medical Imaging Science	6	2
PHN402	Radiotherapy	6	2
PHN405	Physiological Measurement	6	2
PHN407	Case Studies*	6	

### Summer School (10 weeks)

PHN257	Clinical Ultrasound 2*	12	
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The three units PHN157, PHN257 and PHN357 are compulsory for students in the Medical Ultrasound Major. Each unit involves 240 hours of clinical experience and students must successfully complete these units in the order PHN157, PHN257 and PHN357, unless special permission is granted.

### Stage 2

PHN520	Project+	48 per semester
PHN540	Project#	24 per semester

### Credit Points

**Note:** 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 School 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 unit.

A student who has received a 'Fail' result in the project unit may re-enrol in the unit only in exceptional circumstances and with the express permission of the Academic Board.

The program in Medical Physics commences in February each year. The program in Medical Ultrasound commences in July each year. Applications for both programs are to be made prior to 8 November in the preceding year.

Medical Ultrasound students undertake Stage 1 second semester units in their first semester of enrolment, and Stage 1 first semester units in their second semester of enrolment.

\* No formal class attendance required.

+ Unit extends over two semesters.

# Unit extends over four semesters.

## ■ Master of Applied Science (Medical Laboratory Science) (LS85)

**Location:** Gardens Point campus

**Course Duration:** 3 years part-time

**Total Credit Points:** 144

**Standard Credit Points/Full-Time Semester:** 48

**Course Coordinator:** Contact School of Life Science, telephone 864 2553

### Entry Requirements

#### NORMAL ENTRY

Applicants shall hold a Bachelor of Applied Science (or equivalent) in the appropriate discipline for which they are seeking admission and shall normally have had at least one year of appropriate work experience in the discipline for which they are seeking admission.

Applicants may be required to attend an interview with the Head of School and/or course coordinator to establish suitability for entrance into the course.

#### SPECIAL ENTRY

Applicants who do not hold the specific tertiary qualification required of normal entrants may be admitted upon successful completion of a qualifying program prescribed by the Head of School.

### Special Course Requirement

There is a student intake into the Medical Laboratory Science Major every second year.

It is expected that there will be an intake into the part-time course in 1993.

Students should consult the course coordinator regarding their programs.

Students must select two disciplinary specialisation elective units in Year 3, Semesters 1 and 2.

The project (dissertation) is carried out in the laboratory. The employer's written permission is required.

### Part-Time Course Structure

		Credit Points	Contact Hrs/Wk
<b>Year 1, Semester 1</b>			
LWS001	Medicine & the Law	12	3
PUN601	Contemporary Health Care Issues	12	3
<b>Year 1, Semester 2</b>			
LSN102	Cellular Basis of Disease	12	3
LSN110	Molecular Basis of Disease	12	3
<b>Year 2, Semester 1</b>			
LSN150	Epidemiology & Research Strategies	12	3
PUN602	Health Planning, Management/Evaluation	12	3
	OR		
LSB537	Genetic Engineering*	12	5
	OR		
LSP739	Clinical Molecular Biology*	12	5

\* First offering in 1994.

### Year 2, Semester 2

LSN306	Pathophysiology	12	3
LSN401	Advances in Medical Laboratory Science OR	12	3
LSB637	Molecular Genetics*	12	5

### Year 3, Semester 1

LSN510	Clinical Biochemistry 1	}	select one	12	3
LSN511	Haematology 1			12	3
LSN512	Histopathology 1			12	3
LSN515	Microbiology 1			12	3
LSN517	Immunology 1			12	3
LSN518	Diagnostic Cytology 1			12	3
LSN530	Dissertation 1			12	3

### Year 3, Semester 2

LSN531	Dissertation 2	}	select one	12	3
LSN610	Clinical Biochemistry 2			12	3
LSN611	Haematology 2			12	3
LSN612	Histopathology 2			12	3
LSN615	Microbiology 2			12	3
LSN617	Immunology 2			12	3
LSN618	Diagnostic Cytology 2			12	3

## ■ Graduate Diploma in Applied Science (SC71)

No enrolments are accepted directly into this course. For details see Course Rules for Master of Applied Science (SC80) (paragraph 4.2).

## ■ Graduate Diploma in Applied Science (Medical Physics), Graduate Diploma in Applied Science (Medical Ultrasound) (PH71)

No enrolments are accepted directly into this course. For details see Course Rules for Master of Applied Science (Medical Physics); Master of Applied Science (Medical Ultrasound) (PH80).

## ■ Graduate Diploma in Biotechnology (LS70)

**Location:** Gardens Point campus

**Course Duration:** 2 years part-time

**Total Credit Points:** 96

**Standard Credit Points/Full-Time Semester:** 48

**Course Coordinator:** Dr Peter Timms

\* First offering in 1994.

## Entry Requirements

### NORMAL ENTRY

To be eligible for entry to the Graduate Diploma in Biotechnology an applicant must have completed an appropriate degree or diploma in a relevant science area.

### SPECIAL ENTRY

Applicants who do not hold the tertiary qualifications required for normal entry may be eligible for admission if they have completed a diploma or degree in another appropriate non-science area as determined by the Head of School, and are employed in the biotechnology area.

### Part-Time Course Structure

		Credit Points	Contact Hrs/Wk
<b>Year 1, Semester 2</b>			
CHP120	Biochemical Engineering	12	5
LSB468	Molecular Biology	12	5
<b>Year 2, Semester 1</b>			
CHP320	Downstream Processing	12	5
LSB537	Genetic Engineering*	12	5
<b>Year 2, Semester 2</b>			
LSP127	Topics in Biotechnology	12	5
LSB637	Molecular Genetics*	12	5
<b>Year 3, Semester 1</b>			
LSP735	Human Molecular Biology	12	5
LSP737	Plant & Animal Molecular Biology	12	5

## ■ Policy on Credit Transfer, Relating to Bachelor-Level Courses in the Faculty of Science

### FROM INCOMPLETE BACHELOR-LEVEL SCIENCE COURSES

Students transferring to a bachelor's degree course offered by the Faculty of Science at QUT from a comparable, partially completed course in a recognised institution may be granted credit towards the QUT award. In general, credit will be granted pro rata; for example, 96 credit points of credit normally will be granted for each year of full-time study (or its equivalent) completed successfully at the other institution. The maximum credit which may be granted is 192 credit points.

Each application for credit towards a Faculty of Science award will be considered individually, on its merits. Students who have completed successfully a year or more of full-time study (or its equivalent) at another institution nevertheless may be required to undertake specific first-level units at QUT. Also, to satisfy the relevant QUT degree rules, some students may have to gain credit totalling more than 288 credit points.

### FROM COMPLETED ASSOCIATE DIPLOMA COURSES

Students entering a bachelor's degree course offered by the Faculty of Science at QUT following successful completion of a relevant Associate Diploma course from a recognised institution may be granted credit towards the QUT award. The maximum credit which may be granted is 96 credit points.

\* First offering 1994.

Unless the Dean determines otherwise, the credit will be granted as provisional credit. To have the credit confirmed, the student undertakes in the QUT course a program of study of at least 48 credit points and attains a grade point average of not less than 4.0. If, at the conclusion of such a course of study, the student's grade point average is less than 4.0, the Dean shall determine both the extent to which credit granted conditionally may be retained and the student's subsequent program of study in the course.

## ■ Bachelor of Applied Science (Honours) (SC60)

One year honours programs in one of Chemistry, Geology, Life Science, Mathematics or Medical Physics.

**Location:** Gardens Point campus

**Course Duration:** 1 year full-time, 2 years part-time

**Total Credit Points:** 96

**Standard Credit Points/Full-Time Semester:** 48

### **Course Coordinators:**

Chemistry Major – Dr John Bartley

Geology Major – Dr Al Grenfell

Life Science Major – Associate Professor James Dale

Mathematics Major – Associate Professor Helen MacGillivray

Medical Physics Major – Mr Ross Dunlop

### **Entry Requirements**

To be eligible for admission, students should have completed QUT's Bachelor of Applied Science (SC30 or MA34) or equivalent and should have attained a grade point average (GPA) of at least 5.0 over that degree, including grades of at least credit in all units directly relevant to the proposed honours program. Application for admission should normally be made at the end of the final year of the pass degree, or within 18 months of completing that degree.

Applicants who do not satisfy the above conditions but who have demonstrated outstanding performance in only the final year of a degree, or whose application is based on other factors including work experience or involvement in research, may be admitted at the discretion of the Dean.

Please note that for the Mathematics major, other degrees with major studies in Mathematics (including Statistics) may provide suitable entry to the program.

### **Course Structure**

The honours program is comprised of 96 credit points. The course structure depends on the major and may vary slightly from one student to another, depending on the program and particular units chosen.

Part-time candidates undertake annually approximately half of the full-time program. Classes are held at the same times as for full-time students and thus may involve some day release.

Students should consult the coordinator concerning the availability of units and selection of units for their major.

## Course Structure

The general course structure consists of a project (see below) and units or advanced topics chosen from the program of the selected major. The unit IFN001 Advanced Information Retrieval Skills may also be included.

		Credit Points	Contact Hrs/Wk
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### CHEMISTRY MAJOR

#### Semester 1

CHB700/1	Research Project	22	
CHB701/1	Complementary Studies for Chemists	4	2
CHB740	Elective Studies 1*	6	2
CHB780/1	Advanced Topics in Chemistry 1	12	6
IFN001	Advanced Information Retrieval Skills	4	2

#### Semester 2

CHB700/2	Research Project	26	
CHB701/2	Complementary Studies for Chemists	4	2
CHB780/2	Advanced Topics in Chemistry 1	12	6
CHB840	Elective Studies 2*	6	2

### GEOLOGY MAJOR

Students should complete Project (Semesters 1 and 2), Case Studies (Semesters 1 and 2), Information Retrieval Skills and Complementary Studies.

ESB700/1	Project	24	
ESB700/2	Project	24	
ESB701/1	Geological Case Studies	5	3
ESB701/2	Geological Case Studies	5	3
ESB710	Environmental Geochemistry+	6	2
ESB711	Advanced Resource Geology+	6	2
ESB712	Advanced Engineering Geology+	6	2
ESB713	Petrochemistry+	6	2
ESB714	Global Plate Tectonics+	6	2
EAB715	Advanced Sedimentology and Stratigraphy+	6	2
ESB716	Advanced Topics in Geophysics+	6	2
SCB702	Complementary Studies	8	6

### LIFE SCIENCE MAJOR

LSB722	Research Strategies	16	4
LSB723	Readings in Life Science 1	16	
LSB823	Readings in Life Science 2	48	1
IFN001	Advanced Information Retrieval Skills	4	1

and one of the following:

LSB558	Applied Physiology	12	5
LSB734	Analytical Electron Microscopy	12	5
LSB801	Advanced Plant Physiology and Biochemistry	12	5
LSB804	Advanced Population Biology	12	5
LSP120	Advanced Genetic Engineering	12	5
LSP735	Human Molecular Biology	12	5
LSP737	Plant and Animal Molecular Biology	12	5

or another unit approved by the Head of School in consultation with the Supervisor.

### MATHEMATICS MAJOR

Students select five units each of 12 credit points, plus completing a project of 36 credit points. The units are chosen from those listed below if offered in that year.

\* Students choose two units from a selection of Chemistry and other relevant disciplines.

+ Students choose three units from a selection of advanced topics (ESB710 – ESB716).

ITN502	Computer Security	12	4
MAB906	Topics in Analysis	12	4
MAB913	Numerical Analysis 3	12	4
MAB920	Introduction to Cryptology	12	3
MAB929	Time Series & Statistical Forecasting	12	4
MAB970	Probability Theory & Stochastic Processes	12	4
MAB971	Advanced Mathematics of Finance	12	4
MAB972	Error Correction & Data Compression	12	4
MAB973	Partial Differential Equations	12	4
MAB974	Sampling & Survey Techniques	12	4
MAB975	Ordinary Differential Equations & Chaos	12	4
MAB976	Reliability & Survival Analysis	12	4
MAB977	Scheduling & Networks	12	4
MAB978	Statistical Signal Processing & Image Analysis	12	4
MAB979	Statistical Modelling & Data Analysis	12	4
MAB980	Stochastic Processes & Applications	12	4
MAB981	Applied Statistical Inference & Experimentation	12	4
MAB982	Advanced Topics in Cryptology	12	4
MAB983	Finite Mathematics (elective unit from UQ Honours Program in Finite Mathematics)	24	8
MAB984	Actuarial Statistics	12	4
MAB985	Numerical Analysis	12	4
MAB986	Mathematical Modelling of Industrial Processes	12	4
MAB987	Optimisation of Controlled Processes	12	4
MAB989/1	Project	18	
MAB989/2	Project	18	
<b>MEDICAL PHYSICS MAJOR</b>			
PHB701	Topics in Medical Physics 1	12	4
PHB702	Topics in Medical Physics 2	12	4
PHB703	Topics in Medical Physics 3	12	4
PHB704	Topics in Medical Physics 4	12	4
PHB705/1	Project	24	
PHB705/2	Project	24	

## ■ Bachelor of Applied Science with Majors in Biology, Chemistry, Microbiology/Biochemistry, Geology, Mathematics, Physics (SC30)

**Location:** Gardens Point campus

**Course Duration:** 3 years full-time, 6 years part-time

**Total Credit Points:** 288

**Standard Credit Points/Full-Time Semester:** 48

**Course Coordinator:** Dr Don Field

### Course Rules

1. A student may enrol as either a full-time or a part-time student. A full-time student is one who is enrolled in 36 or more credit points per semester. A part-time student is one who is enrolled in less than 36 credit points in the semester.
2. All commencing students and certain continuing 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 effecting any change of enrolment.



3. Students are normally expected to complete the course in minimum time. A full-time student enrolls in an average of 48 credit points per semester for six semesters and a part-time student enrolls in an average of 24 credit points per semester for 12 semesters.

4. To fulfil the requirements for the award of the degree, a student must complete units totalling at least 288 credit points, comprising major and minor studies, and supporting units.

Major and minor studies are defined in terms of the discipline and the academic level at which units are offered:

- (i) 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 units totalling at least 120 credit points from the second and third schedules, including a minimum of 48 credit points at third level. The general requirements for each major are set out in Table 1.
- (ii) A minor may be completed in any approved discipline within the University. Completion of a minor consists of passing units totalling at least 48 credit points from the second and third levels, and including at least 24 credit points at third level.

Major and minor studies may be undertaken in the same or in closely related discipline areas.

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

This involves 10-12 months of paid full-time employment in an approved industrial/commercial environment during which time the student is enrolled in the unit SCB100 Cooperative Education. On completion of the approved cooperative education placement the student resumes formal studies.

### Notes on the Rules

- (i) First, second and third level units are defined, respectively, to be those listed in the first, second and third schedules to the course rules. In general, it is expected that a second level unit will have one or more first level prerequisite units. Similarly, a third level unit is likely to have one or more second level prerequisite units. The unit schedules are shown in Table 2.
- (ii) Instead of the major and minor requirement described in Rule 3, students may, in special circumstances and with the written approval of the Dean, undertake two majors or a major and two minors.

### Table 1 – General requirements for majors

The units and specifications listed are the minimum requirements for completion of a major in each discipline.

Major	First Level	Second & Third Level
Biology	Biology 1 Biology 2 OR Cell Biology Chemistry 1 and 2 Maths 1 Statistics	120 credit points of Biology units including 48 from the third level
Chemistry	Chemistry 1 and 2 At least 36 credit points from other first level Science units OR Computing OR Introduction to Computing	120 credit points of Chemistry units including 48 from the third level
Geology	Earth Science 1 and 2 At least 48 credit points from other first level Science units OR Computing OR Introduction to Computing	120 credit points of Geology units including 48 from the third level
Mathematics	Mathematics 1 and 2 Discrete Mathematics Statistics	120 credit points of Mathematics units including 48 from the third level
Microbiology/ Biochemistry	Cell Biology Chemistry 1 and 2 Statistics Human Anatomy and Physiology At least 12 credit points from other first level science units OR Computing OR Introduction to Computing	120 credit points of Microbiology/Biochemistry units including 48 from the third level
Physics	Physics 1 and 2 Maths 1 and 2 Statistics* Introduction to Computing*	120 credit points of Physics units including 48 from the third level Mathematics 3 Mathematics 4

All students must take School Learning at University unless exemption has been granted.

**Note:** There is no evening program for part-time students. Part-time students will attend classes with full-time students and therefore will require day release to attend most units.

Table 2 - Schedule of Units		Semester	Credit	Contact
First Schedule - First Level Units		Offered	Points	Hrs/Wk
CHB182	Chemistry 1	1,2	12	6
CHB282	Chemistry 2	1,2	12	6
CSB155	Introduction to Computing	1,2	12	3
CSB263	Computing	1,2	12	3
ESB122	Earth Science 1	1	12	5
ESB222	Earth Science 2	2	12	5
LSB122	Biology 1	1	12	5
LSB222	Biology 2	2	12	5
LSB232	Cell Biology	2	12	5
LSB242	Human Anatomy & Physiology	1,2	12	5
MAB102	Basic Mathematics	1	12	4
MAB212	Mathematics 1	1,2	12	4
MAB222	Mathematics 2	1,2	12	4

\* These units need not be taken in First Year.

MAB232	Discrete Mathematics	1,2	12	4
MAB237	Statistics	1,2	12	4
MAB301	Calculus & Analysis A	1,2	12	4
MAB303	Algebra & Analysis B	1,2	12	4
MAB304	Calculus & Vector Algebra	1,2	12	4
MAB321	Computational Mathematics	1,2	12	4
MAB342	Mathematics of Finance	1,2	12	4
MAB347	Statistics 1A	1,2	12	4
MAB348	Statistics 1B	1,2	12	4
PHB122	Physics 1	1	12	5
PHB222	Physics 2	2	12	5
SCB001	Learning at University	1	2	1
SCB222	Exploration of the Universe	2	12	5

#### INTRODUCTORY UNITS

CHB001	Introductory Chemistry	1,2	6	3
LSB001	Introductory Biology	1	6	3
PHB001	Introductory Physics	1,2	6	3

#### OTHER UNITS

Students may take units from any discipline within the University. Some other units offered at first level are listed below:

PHB150	Physics 1H	1	12	6
PHB263	Physics 2E	2	12	6

#### Second Schedule - Second Level Units

		Semester Offered	Credit Points	Contact Hrs/Wk
CHB313	Analytical Chemistry 3	1,2	12	5
CHB333	Inorganic Chemistry 3	1	12	5
CHB352	Organic Chemistry 3	1	12	5
CHB372	Physical Chemistry 3	1	12	5
CHB423	Chemical Technology 4	2	12	5
CHB453	Organic Chemistry 4	2	12	5
CHB473	Physical Chemistry 4	2	12	5
ESB312	Mineralogy & Optical Mineralogy	1	12	5
ESB342	Structural Geology	1	12	5
ESB362	Economic Mineral Deposits	1	12	5
ESB392	Field Techniques and Studies	1	12	5
ESB422	Sedimentology & Stratigraphy	2	12	5
ESB442	Geomorphology	2	12	5
ESB452	Geochemistry	2	12	5
ESB462	Lithology	2	12	5
LSB302	Animal Biology 1	1	12	5
LSB308	Biochemistry 3	1	12	5
LSB312	Marine Studies	1	12	5
LSB318	Biochemical Methodology 3	1	12	5
LSB322	Plant Biology	1	12	5
LSB328	Microbiology 3	1	12	5
LSB332	Plant Physiology 1	1	12	5
LSB352	Population Ecology	1	12	5
LSB358	Physiology 2S	1	12	5
LSB362	Quantitative Methods in Life Science	1	12	5
LSB402	Animal Biology 2	2	12	5
LSB408	Biochemistry 4	2	12	5
LSB412	Applied Ecology A	2	12	5
LSB418	Biochemical Methodology 4	2	12	5
LSB422	Applied Ecology B	2	12	5
LSB428	Microbiology 4	2	12	5
LSB432	Genetics	2	12	5
LSB438	Immunology 4	2	12	5
LSB442	Plant Tissue Culture 1	2	12	5
LSB458	Physiology 3S	2	12	5
LSB468	Molecular Biology	2	12	5

MAB422	Topics in Mathematics	2	12	4
MAB432	Mathematics 3	1	12	4
MAB452	Mathematics 4	2	12	4
MAB601	Multivariable Calculus	1	12	4
MAB602	Vector Field Study Theory	2	12	4
MAB612	Differential Equations	2	12	4
MAB618	Numerical Analysis 1	1,2	12	4
MAB619	Numerical Analysis 2	2	8	3
MAB620	Finite Mathematics	2	12	4
MAB630	Linear Algebra & its Applications	1	12	4
MAB635	Mechanics	1	12	4
MAB637	Operations Research 1A	1,2	12	4
MAB638	Operations Research 1B	2	8	3
MAB641	Actuarial Mathematics	1	12	4
MAB647	Statistics 2A	1	12	4
MAB648	Statistics 2B	2	8	3
PHB322	Physics 3A	1	12	5
PHB332	Physics 3B	1	12	5
PHB342	Physics 3C	1	12	5
PHB422	Physics 4A	2	12	5
PHB432	Physics 4B	2	12	5
PHB462	Experimental Physics 4	2	12	5

#### OTHER UNITS

Students may take units from any discipline within the University. Some other units offered at second level are listed below.

PUB353	Consumer Food	1	12	4
PUB405	Human Nutrition	2	12	5

#### Cooperative Education Program

A registered student who has completed the equivalent of the first and second years of the standard full-time course, normally with a GPA 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 is enrolled in the unit SCB100 Cooperative Education. On completion of the approved cooperative education placement the student resumes formal studies.

#### Third Schedule - Third Level Units

		Semester Offered	Credit Points	Contact Hrs/Wk
CHB510	Instrumental Analysis	1	8	4
CHB513	Instrumental Analysis 5	1	12	5
CHB523	Chemical Technology 5	1	12	5
CHB533	Inorganic Chemistry 5	1	12	5
CHB553	Organic Chemistry 5	1	12	5
CHB573	Physical Chemistry 5	1	12	5
CHB600	Project	2	20	10
CHB603	Project	2	12	5
CHB610	Advanced Analysis	2	4	2
CHB613	Instrumental Analysis 6	2	12	5
CHB623	Chemical Technology 6	2	12	5
CHB627	Chemical Technology 6	2	4	2
CHB628	Energy Technology	2	6	3
CHB643	Applied Spectroscopy	2	12	5
CHB660	Industrial Visits	2	2	1
CHB663	Environmental Chemistry	2	12	5
CHB690	Advanced Materials Science	2	8	3
CHB693	Materials Chemistry	2	12	5
ESB512	Igneous & Metamorphic Petrology	1	12	5
ESB522	Hydrogeology	1	12	5
ESB532	Applied Geophysics	1	12	5

ESB552	Applied Geochemistry	1	12	5
ESB562	Mineral Exploration	1	12	5
ESB592	Geological Field Excursions	1	12	5
ESB602	Geological Investigations	2	12	5
ESB612	Earth Resources Management	2	12	5
ESB622	Engineering Geology	2	12	5
ESB632	Advanced Geophysics	2	12	5
ESB642	Structural Geology & Geotectonics	2	12	5
ESB662	Mining Geology & Feasibility	2	12	5
ESB672	Geology of Fossil Fuels	2	12	5
LSB372	Aquaculture 1	1	12	5
LSB502	Projects 1	1	16	6
LSB508	Biochemistry 5	1	12	5
LSB512	Environmental Monitoring	1	8	3
LSB528	Microbial Physiology & Metabolism	1	12	5
LSB532	Population Genetics	1	8	3
LSB538	Molecular Biology	1	12	5
LSB542	Plant Tissue Culture 2	1	12	5
LSB548	Biochemical Separations	1	12	5
LSB558	Applied Physiology	1	12	5
LSB568	Electron Microscopy	2	12	5
LSB572	Aquaculture 2	2	12	5
LSB578	Virology	1	12	5
LSB582	Selected Topics 1	1	12	5
LSB592	Field Studies 2	1	12	5
LSB602	Projects 2	2	16	6
LSB608	Biochemistry 6	2	12	5
LSB618	Analytical Biochemistry 6	1	12	5
LSB622	Case Studies	2	12	5
LSB628	Applied Microbiology	2	12	5
LSB632	Plant Physiology 2	2	12	5
LSB638	Genetic Engineering	2	12	5
LSB648	Microbial Technology	2	12	5
LSB652	Biological Resources	2	12	5
LSB658	Clinical Physiology	2	12	5
LSB662	Population Management	2	12	5
LSB682	Selected Topics 2	2	12	5
MAB906	Topics in Analysis	1	12	4
MAB907	Statistics 3A	1	12	4
MAB908	Statistics 3B	2	12	4
MAB912	Fluid Dynamics	1	12	4
MAB913	Numerical Analysis 3	2	12	4
MAB920	Introduction to Cryptology	1	12	4
MAB927	Operations Research 2A	1	12	4
MAB928	Operations Research 2B	2	12	4
MAB929	Time Series & Statistical Forecasting	2	12	4
MAB941	Mathematical Modelling in Economics	1	12	4
MAB942	Optimisation Methods	1	12	4
MAB960	Project Work	1,2	12	4
MAB970	Probability Theory & Stochastic Processes	1	12	4
MAB971	Advanced Mathematics of Finance	2	12	4
MAB972	Error Correction & Data Compression	2	12	4
MAB973	Partial Differential Equations	2	12	4
MAB974	Sampling & Survey Techniques	2	12	4
MAB975	Ordinary Differential Equations & Chaos	2	12	4
MAB976	Reliability & Survival Analysis	2	12	4
PHB512	Project	1,2	12	5
PHB522	Applied Quantum Mechanics	1	12	5
PHB532	Electromagnetic Field Theory	1	12	5
PHB562	Physical Methods of Analysis	1	12	5
PHB622	Solid State Physics	1	12	5
PHB632	Nuclear & Particle Physics	2	12	5
PHB642	Applied Radiation & Health Physics	2	12	5

## OTHER UNITS

Students may take units from any discipline within the University. Some other units offered at third level are listed below.

PUB631	Nutritional Biochemistry	2	12	5
SCB510	Introduction to Quality Management	1	12	3

## ■ Bachelor of Applied Science (Applied Chemistry) (CH32)

**Location:** Gardens Point campus

**Course Duration:** 3 years full-time, 6 years part-time

**Total Credit Points:** 288 (minimum)

**Standard Credit Points/Full-Time Semester:** 48

**Course Coordinator:** Mr Eric O'Reilly

Full-Time Course Structure		Credit Points	Contact Hrs/Wk
<b>Year 1, Semester 1</b>			
CHB173	Chemistry 1A	12	6
CHB183	Chemistry 1B	12	6
MAB212	Mathematics 1	12	4
PHB122	Physics 1	12	5
SCB001	Learning at University	2	1
<b>Year 1, Semester 2</b>			
CHB283	Chemistry 2A	12	5
CHB253	Chemistry 2B	12	5
CSB263	Computing	12	4
MAB237	Statistics	12	4
<b>Year 2, Semester 1</b>			
CHB313	Analytical Chemistry 3	12	5
CHB333	Inorganic Chemistry 3	12	5
CHB353	Organic Chemistry 3A	12	5
CHB373	Physical Chemistry 3A	12	5
<b>Year 2, Semester 2</b>			
CHB423	Chemical Technology 4	12	5
CHB453	Organic Chemistry 4	12	5
CHB473	Physical Chemistry 4	12	5
	Elective Unit	12	
<b>Year 3, Semester 1</b>			
CHB513	Instrumental Analysis 5	12	5
CHB523	Chemical Technology 5	12	5
Two of:			
CHB533	Inorganic Chemistry 5	12	5
CHB553	Organic Chemistry 5	12	5
CHB573	Physical Chemistry 5	12	5
	Elective Unit	12	
<b>Year 3, Semester 2</b>			
CHB613	Instrumental Analysis 6	12	5
CHB623	Chemical Technology 6	12	5
CHB693	Materials Chemistry	12	5

One of:			
CHB603	Project	12	5
CHB643	Applied Spectroscopy	12	5
CHB653	Applied Biological Chemistry	12	5
CHB663	Environmental Chemistry	12	5
	Elective Unit	12	

### Cooperative Education Program

A registered student who has completed the equivalent of the first and second years of the standard full-time course, normally with a GPA 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 is enrolled in the unit SCB100 Cooperative Education. On completion of the approved industrial experience the student resumes formal studies.

Part-Time Course Structure		Credit Points	Contact Hrs/Wk
<b>Year 1, Semester 1</b>			
CHB173	Chemistry 1A	12	6
PHB122	Physics 1	12	5
SCB001	Learning at University	2	1
<b>Year 1, Semester 2</b>			
CHB183	Chemistry 1B	12	6
MAB212	Mathematics 1	12	4
<b>Year 2, Semester 1</b>			
CHB283	Chemistry 2A	12	5
MAB237	Statistics	12	4
<b>Year 2, Semester 2</b>			
CHB253	Chemistry 2B	12	5
CSB263	Computing	12	4
<b>Year 3, Semester 1</b>			
CHB353	Organic Chemistry 3A	12	5
CHB373	Physical Chemistry 3A	12	5
<b>Year 3, Semester 2</b>			
CHB473	Physical Chemistry 4	12	5
CHB453	Organic Chemistry 4	12	5
<b>Year 4, Semester 1</b>			
CHB313	Analytical Chemistry 3	12	5
CHB333	Inorganic Chemistry 3	12	5
<b>Year 4, Semester 2</b>			
CHB423	Chemical Technology 4	12	5
	Elective Unit	12	
<b>Year 5, Semester 1</b>			
CHB513	Instrumental Analysis 5	12	5
CHB523	Chemical Technology 5	12	5

### Year 5, Semester 2

CHB613	Instrumental Analysis 6	12	5
CHB623	Chemical Technology 6	12	5

### Year 6, Semester 1

Two of:

CHB533	Inorganic Chemistry 5	12	5
CHB553	Organic Chemistry 5	12	5
CHB573	Physical Chemistry 5	12	5
	Elective Unit	12	

### Year 6, Semester 2 (First Offering 1994)

CHB693	Materials Chemistry	12	5
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One of:

CHB653	Applied Biological Chemistry	12	5
CHB663	Environmental Chemistry	12	5
CHB601	Project*	10	4

### Year 6, Semester 1 (Final Offering 1993)

CHB510	Instrumental Analysis	8	4
CHB601	Project*	10	6
CHB627	Chemical Technology 6	4	2
CHB640	Chemistry 6	4	2

### Year 6, Semester 2 (Final Offering 1993)

CHB601	Project*	10	6
CHB610	Advanced Analysis	4	2
CHB660	Industrial Visits	2	1
HRB122	Management	4	1
	Chemistry Elective Unit+		
CHB628	Energy Technology	6	3
	OR		
CHB690	Advanced Material Science	8	3
	OR		
	Other approved Chemistry Elective		

## ■ Bachelor of Applied Science (Mathematics) (MA34)

**Location:** Gardens Point campus

**Course Duration:** 3 years full-time, 6 years part-time

**Total Credit Points:** 288

**Standard Credit Points/Full-Time Semester:** 48

**Course Coordinator:** Mr Clif Bothwell

### Course Requirements

A student selects units from the list given below, having regard to specified prerequisites and co-requisites, and must complete:

- (i) all units from List A;
- (ii) at least 36 credit points from List B;

\* Unit extends over two semesters.

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



(iii) at least 144 credit points from Lists C and D with at least 48 credit points from List D;

(iv) a minimum of 288 credit points.

List A		Semester Offered	Credit Points	Contact Hrs/Wk
CSB155	Introduction to Computing	1,2	12	4
MAB301	Calculus and Analysis A	1,2	12	4
MAB303	Algebra and Analysis B	1,2	12	4
MAB347	Statistics 1A	1,2	12	4
List B				
MAB304	Calculus and Vector Algebra	1,2	12	4
MAB321	Computational Mathematics	1,2	12	4
MAB342	Mathematics of Finance	1,2	12	4
MAB348	Statistics 1B	1,2	12	4
List C				
MAB601	Multivariable Calculus	1	12	4
MAB602	Vector Field Theory	2	12	4
MAB612	Differential Equations	2	12	4
MAB618	Numerical Analysis 1	1,2	12	4
MAB619	Numerical Analysis 2	1	8	3
MAB620	Finite Mathematics	2	12	4
MAB630	Linear Algebra & its Applications	1	12	4
MAB635	Mechanics	1	12	4
MAB637	Operations Research 1A	1,2	12	4
MAB638	Operations Research 1B	2	8	3
MAB641	Actuarial Mathematics	1	12	4
MAB647	Statistics 2A	1	12	4
MAB648	Statistics 2B	2	8	3
Elective Units [a maximum total of 72 credit points with not more than 48 at first level]		1,2	8-12ea	3-6ea
List D				
MAB906	Topics in Analysis	1	12	4
MAB907	Statistics 3A	1	12	4
MAB908	Statistics 3B	2	12	4
MAB913	Numerical Analysis 3	2	12	4
MAB920	Introduction to Cryptology	1	12	4
MAB927	Operations Research 2A	1	12	4
MAB928	Operations Research 2B	2	12	4
MAB929	Time Series & Statistical Forecasting	2	12	4
MAB941	Mathematical Modelling in Economics	1	12	4
MAB942	Optimisation Methods	1	12	4
MAB960	Project Work	1,2	12	4
MAB970	Probability Theory & Stochastic Processes	1	12	4
MAB971	Advanced Mathematics of Finance	2	12	4
MAB973	Partial Differential Equations	2	12	4
MAB974	Sampling & Survey Techniques	2	12	4
MAB975	Ordinary Differential Equations & Chaos	2	12	4
SCB510	Introduction to Quality Management	1	8	3

### Cooperative Education Program

A registered student who has completed the equivalent of the first and second years of the standard full-time course, normally with a GPA 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 is enrolled in the unit SCB100 Cooperative Education. On completion of the approved Cooperative Education placement the student resumes formal studies.

## ■ Bachelor of Applied Science (Medical Laboratory Science) (LS36)

**Location:** Gardens Point campus

**Course Duration:** 3 years full-time, 6 years part-time

**Total Credit Points:** 288

**Standard Credit Points/Full-Time Semester:** 48

**Course Coordinator:** Contact School of Life Science Office, telephone 864 2553.

### Professional Recognition

Graduates are immediately eligible for graduate membership of the Australian Institute of Medical Scientists and will have completed the academic requirements for admission as associate members.

### Special Course Requirement

Students in the part-time program should be aware that they are required to attend much of their program during the day.

Students are required to undertake a two to four week work experience program in a practising pathology laboratory. This takes place at the end of the second year full-time and in a suitable vacation period during the part-time program. This is a requirement for the unit LSB480 Professional Practice.

### Full-Time Course Structure

		Credit Points	Contact Hrs/Wk
<b>Year 1, Semester 1</b>			
CHB142	Chemistry 1	12	6
ISB382	Microcomputer Applications	8	3
LSB130	Anatomy 1	8	3
LSB100	Microbiology 1	8	3
PHB150	Physics 1H	12	6
<b>Year 1, Semester 2</b>			
CHB242	Chemistry 2	12	6
LSB210	Quantitative Laboratory Techniques 2	12	5
LSB230	Anatomy 2	8	3
LSB240	Physiology 2	8	4
PHB262	Physics 2L	8	4
<b>Year 2, Semester 1</b>			
CHB382	Chemistry 3	4	2
LSB300	Microbiology 3	8	4
LSB308	Biochemistry 3	12	5
LSB310	Quantitative Laboratory Technology 3	8	4
LSB340	Physiology 3	8	4
LSB370	Disease Processes 3	4	2

**Year 2, Semester 2**

LSB400	Microbiology 4	8	4
LSB408	Biochemistry 4	12	5
LSB430	Immunology 4	8	4
LSB437	Molecular Biology	8	4
LSB450	Haematology 4	8	4
LSB460	Histopathology 4	8	4
LSB480	Professional Practice		2-4 weeks

**Year 3, Semester 1**

LSB500	Microbiology 5	16	7
LSB520	Clinical Biochemistry 5	8	4
LSB530	Immunology 5	8	4
LSB550	Haematology 5	8	4
LSB560	Histopathology 5	8	4

**Year 3, Semester 2**

LSB600	Clinical Bacteriology 6	16	7
LSB620	Clinical Biochemistry 6	8	4
LSB630	Immunohaematology 6	8	4
LSB650	Haematology 6	8	4
LSB660	Histopathology 6	8	4

**Part-Time Course Structure**

**Credit Points**                      **Contact Hrs/Wk**

**Year 1, Semester 1**

CHB142	Chemistry 1	12	6
LSB100	Microbiology 1	8	3
LSB130	Anatomy 1	8	3

**Year 1, Semester 2**

CHB242	Chemistry 2	12	6
LSB230	Anatomy 2	8	3
LSB240	Physiology 2	8	4

**Year 2, Semester 1**

ISB382	Microcomputer Applications	8	3
LSB300	Microbiology 3	8	4
PHB150	Physics 1H	12	6

**Year 2, Semester 2**

PHB262	Physics 2L	8	4
LSB210	Quantitative Laboratory Techniques 2	12	5

**Year 3, Semester 1**

CHB382	Chemistry 3	4	2
LSB310	Quantitative Laboratory Technology 3	8	4
LSB308	Biochemistry 3	12	5

**Year 3, Semester 2**

LSB400	Microbiology 4	8	4
LSB408	Biochemistry 4	12	5
LSB437	Molecular Biology	8	4

**Year 4, Semester 1**

LSB340	Physiology 3	8	4
LSB370	Disease Processes	4	2

**Year 4, Semester 2**

LSB430	Immunology 4	8	4
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LSB450	Haematology 4	8	4
LSB460	Histopathology 4	8	4
LSB480	Professional Practice		2-4 weeks

### Year 5, Semester 1

LSB520	Clinical Biochemistry 5	8	4
LSB550	Haematology 5	8	4
LSB560	Histopathology 5	8	4

### Year 5, Semester 2

LSB620	Clinical Biochemistry 6	8	4
LSB650	Haematology 6	8	4
LSB660	Histopathology 6	8	4

### Year 6, Semester 1

LSB530	Immunology 5	8	4
LSB600	Clinical Bacteriology 6	16	7

### Year 6, Semester 2

LSB500	Microbiology 5	16	7
LSB630	Immunohaematology 6	8	4

## ■ Bachelor of Applied Science (Medical Radiation Technology) with Majors in Medical Imaging Technology and Radiotherapy Technology (PH38)

**Location:** Gardens Point campus

**Course Duration:** 3 years full-time

**Total Credit Points:** 288

**Standard Credit Points/Full-Time Semester:** 48

**Course Coordinator:** Associate Professor Brian J. Thomas

### Assistant Coordinators:

Medical Imaging Technology Major – Ms Pam Rowntree

Radiotherapy Technology Major – Ms Jan Veitch

### UPGRADE PROGRAM

A program to allow holders of an associate diploma or diploma to upgrade to degree level is offered in both majors.

### Full-Time Course Structure

		<b>Credit Points</b>	<b>Contact Hrs/Wk</b>
<b>Year 1, Semester 1</b>			
<b>COMMON UNITS</b>			
COB136	Professional Communication (Service)	6	1.5
LSB141	Anatomy & Physiology 1	10	4
MAB151	Quantitative Techniques	4	2
NSB201	Principles of Patient Care	4	2
SSB910	Introductory Psychology for Health Professionals	4	2
PHB111	Physics 1B	8	3
PHB178	Principles of Medical Radiations	10	5

## Year 1, Semester 2

### COMMON UNITS

LSB221	Introduction to Pathology	6	3
LSB241	Anatomy & Physiology 2	10	4
PHB272	Radiation Physics 1	12	5

### MEDICAL IMAGING TECHNOLOGY MAJOR

PHB275	Processing Technology	4	2
PHB276	General Radiography 1	14	7
PHB279	Clinical Radiography 1	4	2

### RADIOTHERAPY TECHNOLOGY MAJOR

PHB286	Treatment Planning 1	12	6
PHB287	Megavoltage Therapy 1	6	3
PHB289	Clinical Radiotherapy 1	4	2

## Year 2, Semester 1

### COMMON UNITS

LSB321	Systematic Pathology	8	3
LSB341	Regional & Sectional Anatomy	8	4

### MEDICAL IMAGING TECHNOLOGY MAJOR

PHB373	Nuclear Medicine Imaging 1	4	2
PHB374	Radiographic Equipment 1	6	3
PHB376	General Radiography 2	12	5
PHB379	Clinical Radiography 2	10	5

### RADIOTHERAPY TECHNOLOGY MAJOR

PHB382	Radiotherapy Physics 1	4	2
PHB386	Treatment Planning 2	8	4
PHB387	Megavoltage Therapy 2	10	5
PHB389	Clinical Radiotherapy 2	10	5

## Year 2, Semester 2

### COMMON UNITS

PHB475	Medical Radiation Computing 1	8	3
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### MEDICAL IMAGING TECHNOLOGY MAJOR

LSB441	Imaging Anatomy	8	4
PHB473	Medical Ultrasound	4	2
PHB474	Radiographic Equipment 2	4	2
PHB476	Special Procedures	8	3
PHB479	Clinical Radiography 3	8	4
PHB573	Digital Imaging Modalities	6	2

### RADIOTHERAPY TECHNOLOGY MAJOR

PHB481	Dosimetry	6	3
PHB482	Radiotherapy Physics 2	6	3
PHB484	Principles of Treatment 1	6	3
PHB487	Megavoltage Therapy 3	10	4
PHB489	Clinical Radiotherapy 3	8	4
PHB585	Computer Assisted Treatment Planning 1	8	3

## Year 3, Semester 1

### COMMON UNITS

PHB471	Radiation Physics 2	4	2
PHB575	Medical Radiation Computing 2	8	3
PHB672/1	Project	2	1

### MEDICAL IMAGING TECHNOLOGY MAJOR

LSB421	Imaging Pathology	4	2
PHB572	Image Recording & Evaluation	4	2
PHB574	Quality Assurance in Medical Imaging	6	3

PHB576	Advanced Radiographic Technique 1	12	6
PHB578	Image Interpretation 1	4	2
PHB579	Clinical Radiography 4	8	4
<b>RADIOTHERAPY TECHNOLOGY MAJOR</b>			
PHB584	Principles of Treatment 2	4	2
PHB587	Orthovoltage & Superficial Therapy	10	4
PHB589	Clinical Radiotherapy 4	12	6
PHB685	Computer Assisted Treatment Planning 2	8	4
<b>Year 3, Semester 2</b>			
<b>COMMON UNITS</b>			
PHB671	Radiation Biology	4	2
PHB672/2	Project	6	3
SSB918	Counselling for Health Professionals	4	2
<b>MEDICAL IMAGING TECHNOLOGY MAJOR</b>			
PHB676	Advanced Radiographic Technique 2	8	3
PHB679	Clinical Radiography 5 EITHER	14	6
PHB680	Nuclear Medicine Imaging 2 OR	10	5
PHB681	Computed Tomography Imaging	10	5
<b>RADIOTHERAPY TECHNOLOGY MAJOR</b>			
PHB583	Complementary & Evolving Techniques	6	3
PHB683	Oncological Imaging	6	3
PHB687	Specialised Radiotherapy Technique	10	4
PHB689	Clinical Radiotherapy 5	8	4

## ■ Associate Diploma in Applied Science (Biology), Associate Diploma in Applied Science (Chemistry) (SC10)

**Location:** Gardens Point campus

**Course Duration:** 2 years full-time, 4 years part-time

**Total Credit Points:** 192

**Standard Credit Points/Full-Time Semester:** 48

### **Course Coordinators:**

Biology Major – Contact School of Life Science Office, telephone (07) 864 2553

Chemistry Major – Dr Graham Smith

<b>Full-Time Course Structure (Semester 1 common to both Majors)</b>		<b>Credit Points</b>	<b>Contact Hrs/Wk</b>
<b>Year 1, Semester 1</b>			
CHA111	Laboratory Techniques	8	3
CHA145	Introductory Chemistry	8	3
LSX110	Introductory Biology	8	3
LSX111	Microscopy Techniques	8	3
MAA251	Statistics & Data Processing	8	3
PHA154	Introductory Physics	8	3
<b>BIOLOGY MAJOR</b>			
<b>Year 1, Semester 2</b>			
CHA218	Analytical Chemistry 1	8	3
CHA240	Instrumental Techniques	8	3

LSX210	Biology B	8	3
LSX211	Cell Structure & Function	8	3
LSX212	Biological Data Handling	8	3
LSX213	Introductory Biochemistry	8	3

### Year 2, Semester 1

CHA442	Introduction to Occupational Safety	4	2
LSX310	Introduction to Bioculture	8	3
LSX311	Computer Applications in Biology	8	3
LSX312	Animal & Plant Techniques	12	4
	Elective Units* - two of:		
LSX313	Taxonomy	8	3
LSX314	Aquaculture Techniques	8	3
LSX315	Plant Physiology	8	3
LSX316	Hydrobiological Techniques	8	3
	OR		
	Other approved Elective Units		

### Year 2, Semester 2

LSX223	Microbiology 2	8	3
LSX410	Environmental Biology	8	3
LSX411	Population Biology	8	3
LSX412	Field Techniques	8	3
LSX413	Applications in Electron Microscopy	8	3
	Elective Unit* - one of:		
CSA259	Introduction to Computing	8	2
LSX414	Animal Physiology	8	3
LSX415	Plant Cell & Tissue Culture	8	3
	OR		
	Any other approved Elective Unit		

## CHEMISTRY MAJOR

### Year 1, Semester 2

CHA218	Analytical Chemistry 1	8	3
CHA219	Qualitative Analysis	6	3
CHA230	Chemistry of Inorganic Materials	4	2
CHA240	Instrumental Techniques	8	3
CHA250	Organic Chemistry 1	8	3
CHA270	Physical Chemistry 1	8	3
CSA259	Introduction to Computing	8	2

### Year 2, Semester 1

CHA318	Instrumental Analytical Chemistry	8	4
CHA319	Analytical Chemistry 2	6	3
CHA320	Chemical Process Principles 1	8	3
CHA350	Organic Chemistry 2	8	3
CHA370	Physical Chemistry 2	6	2
CHA442	Introduction to Occupational Safety	4	2
	Elective Unit* - one of:		
CHA580	Food Chemistry 1	8	3
	OR		
ESA310	Geology	8	3
	OR		
LSX123	Microbiology 1	8	3
	OR		
	Any other approved Elective Unit		

### Year 2, Semester 2

CHA368	Industrial Chemistry	8	3
CHA410	Computers in Chemistry	8	3
CHA550	Organic Chemistry 3	8	3

\* Students should discuss their choice of elective units with the course coordinator.

CHA610	Industrial Analysis	8	3
CHA670	Physical Chemistry 3 Elective Unit*- one of:	8	3
CHA680	Food Chemistry 2 OR	8	3
LSX223	Microbiology 2 OR	8	3
CHA520	Chemical Process Principles 2 OR Any other approved Elective Unit	8	3

### **Part-Time Course Structure**

Part-time programs can be organised in consultation with the course coordinator. Refer to the full-time program for semester of offering of units. Day release will be required for most units.

**Notes:** Students in the Biology Major may apply to have their current employment arranged and assessed in lieu of one or more elective units. In such cases, the employer, in consultation with the Head of School, nominates an honorary supervisor to collaborate with a School tutor. Under such an arrangement students are required to maintain a work log and complete such exercises and assignments as required.

Students in the Biology Major with relevant technical experience may seek total or partial exemption from one or more of the elective units of the course.

Students participate in excursions and field work where these form part of the curriculum. Occasionally field work may be scheduled at weekends or during University recess periods.

Students who commenced the course prior to 1988 should consult the course coordinator concerning requirements to complete the course.

## **■ Associate Diploma in Clinical Techniques with Elective Units in Laboratory Techniques and Anaesthetic Techniques (LS15)**

**Location:** Gardens Point campus

**Course Duration:** 2 years full-time, 4 years part-time

**Total Credit Points:** 192

**Standard Credit Points/Full-Time Semester:** 48

**Course Coordinator:** Contact School of Life Science Office, telephone (07) 864 2553

### **Professional Recognition**

#### **LABORATORY TECHNIQUES ELECTIVE UNITS**

This program is recognised by both the Commonwealth and State Governments as a suitable employment qualification. Graduates from this program are recognised by the Australian Institute of Medical Scientists and are eligible to become intermediate members of this professional body.

\* Students should discuss their choice of elective units with the course coordinator.



## ANAESTHETIC TECHNIQUES ELECTIVE UNITS

This program is endorsed by the Faculty of Anaesthetists.

### Special Course Requirements

Students may undertake the course on a full-time or part-time basis. Part-time students are required to attend lectures during normal working hours.

Students entering the course may undertake to specialise in either: Laboratory Techniques (Elective Units in Group A), or Anaesthetic Techniques (Elective Units in Group B). To be awarded the Associate Diploma in Clinical Techniques, a student must complete all the units in either prescribed program.

Students undertaking the Anaesthetic Techniques Elective Units may be exempted from whole or part of a unit on providing evidence of training and experience acceptable to the Head of School.

### Full-Time Course Structure

The first year is common to both Programs

**Credit  
Points**                      **Contact  
Hrs/Wk**

#### Year 1, Semester 1

COX104	Communication Techniques	4	2
LSX121	Biological Chemistry 1	8	4
LSX122	Laboratory Instrumentation 1	8	4
LSX123	Microbiology 1	8	3
LSX124	Perspectives in Medicine	4	1
LSX125	Anatomy & Physiology 1	8	3
PHA154	Introductory Physics	8	3

#### Year 1, Semester 2

LSX221	Biological Chemistry 2	8	4
LSX222	Laboratory Instrumentation 2	8	4
LSX223	Microbiology 2	8	3
LSX224	Pathology	8	2
LSX225	Anatomy & Physiology 2	8	3
PHA213	Medical Instrumentation 2	8	4

In Year 2 students should choose either the Laboratory Techniques Elective Units (Group A) or the Anaesthetic Techniques Elective Units (Group B).

### LABORATORY TECHNIQUES PROGRAM

#### Year 2, Semester 1

MAA251	Statistics & Data Processing	8	3
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#### Group A Elective Units

Five of the following:

LSX320	Clinical Biochemical Techniques 3	8	4
LSX321	Clinical Microbiological Techniques 3	8	4
LSX322	Haematological Techniques 3	8	4
LSX323	Histological Techniques 3	8	4
LSX324	Immunological Techniques 3	8	4
LSX325	Cytological Techniques 3	8	4

#### Year 2, Semester 2

CSA259	Introduction to Computing	8	2
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#### Group A Elective Units

Five of the following:

LSX420	Clinical Biochemical Techniques 4	8	4
LSX421	Clinical Microbiological Techniques 4	8	4
LSX422	Haematological Techniques 4	8	4
LSX423	Histological Techniques 4	8	4

SCIENCE

LSX424	Transfusion Techniques 4	8	4
LSX425	Cytological Techniques 4	8	4

## ANAESTHETIC TECHNIQUES PROGRAM

### Group B Elective Units

#### Year 2, Semester 1

LSX331	Foundations of Anaesthetic Techniques	12	5
LSX332	Physiology and Pharmacology	12	5
LSX333	Electronics and Computing	12	5
LSX334	Operating Room Equipment	12	5

#### Year 2, Semester 2

LSX431	Cardiac Care and Resuscitation	12	5
LSX432	Care of Respiratory Airways & Intensive Care	12	5
LSX433	Anaesthesia for Specialised Surgery	12	5
LSX434	Professional Practice	12	5

### Part-Time Course Structure

**Credit Points**      **Contact Hrs/Wk**

#### Year 1, Semester 1

LSX121	Biological Chemistry 1	8	4
LSX122	Laboratory Instrumentation 1	8	4
PHA154	Introductory Physics	8	3

#### Year 1, Semester 2

LSX221	Biological Chemistry 2	8	4
LSX222	Laboratory Instrumentation 2	8	4
PHA213	Medical Instrumentation 2	8	4

#### Year 2, Semester 1

COX104	Communication Techniques	4	2
LSX123	Microbiology 1	8	3
LSX124	Perspectives in Medicine	4	1
LSX125	Anatomy & Physiology 1	8	3

#### Year 2, Semester 2

LSX223	Microbiology 2	8	3
LSX224	Pathology	8	2
LSX225	Anatomy & Physiology 2	8	3
MAA251*	Statistics & Data Processing	8	3

In Year 3, Semester 1 students should choose either the Laboratory Techniques Elective Units or the Anaesthetic Techniques Elective Units.

## LABORATORY TECHNIQUES PROGRAM

Students enrolled in the part-time program are required to pass Introduction to Computing together with five Techniques 3 units and five Techniques 4 units over the four semesters.

#### Year 3, Semester 1

LSX320	Clinical Biochemical Techniques 3	8	4
LSX321	Clinical Microbiological Techniques 3	8	4
LSX322	Haematological Techniques 3	8	4

#### Year 3, Semester 2

CSA259	Introduction to Computing	8	2
LSX420	Clinical Biochemical Techniques 4	8	4
LSX421	Clinical Microbiological Techniques 4	8	4
LSX422	Haematological Techniques 4	8	4

\* This unit for Laboratory Techniques Program only.

### Year 4, Semester 1

LSX323	Histological Techniques 3	8	4
LSX324	Immunological Techniques 3	8	4
LSX325	Cytological Techniques 3	8	4

### Year 4 Semester 2

LSX423	Histological Techniques 4	8	4
LSX424	Transfusion Techniques 4	8	4
LSX425	Cytological Techniques 4	8	4

### ANAESTHETIC TECHNIQUES PROGRAM

Students wishing to study the second year of the full-time course in a part-time program should consult the course coordinator.

## ■ Policy on Submission of Project Reports for Assessment

The Science Academic Board has approved the following rules with regard to the completion of project units in all undergraduate and postgraduate courses (including honours projects):

- (i) A student enrolled in a project unit is required to submit the associated project report, dissertation or thesis for assessment by no later than the final day of the examination period for the semester in which the student's enrolment in that unit will terminate.
- (ii) In special circumstances and on the written recommendation of the student's supervisor, the Dean may grant an extension of time to complete the work associated with the project. The final date for submission of the report after such an extension shall be the last day of the deferred examination period for the semester in which the student's enrolment in that unit would terminate. In such cases, an 'A' result shall be given initially to the student in respect of this unit.
- (iii) The Academic Board may grant a further extension of time to complete the work associated with a project, on condition that the student re-enrols in the project unit for the succeeding semester. Failure to re-enrol in the project unit by the last day of the deferred examination period for the semester in which, otherwise, the student's enrolment in that unit would terminate will result in a grade of Fail (2 or 4) being awarded in that unit.

Subsequent to the assessment process, the relevant school shall have discretion as to whether a candidate needs to re-enrol to effect any amendments required, or whether such amendments are essentially editorial. However, a student who is required to undertake further investigative work relating to his/her project must continue to be enrolled in the relevant project unit.

Students seeking extensions are advised that late submission of a project report for assessment as indicated in (ii) above may prevent publication of the associated result in time for the student to be included on the graduation list for that semester. Thus, course completion and graduate status from the relevant course may be delayed. This could disadvantage students seeking employment or promotion on the basis of the qualification in question.

## ■ Policy and Procedures Concerning Exemption from Practical Work

Exemptions from practical work will not normally be granted by Schools in the Faculty. However, where a student wishes to be exempt on the grounds of some extenuating circumstances from the practical component of a unit attempted previously, they must write to the Head of School controlling the unit (or Dean of Faculty in the case of Faculty units), stating the following:

- (i) the year in which the unit was previously attempted;
- (ii) the total mark/grade obtained for the practical component for the semester, and the maximum possible mark/grade, where known; and
- (iii) the circumstances in which the students are basing their application.

Any documentation relevant to these circumstances must be provided with the application.

Students, if required, must submit practical reports, notebooks, field notes, etc from their previous attempt at the unit. No exemption will be given for practicals where the unit has been attempted more than two years prior to the current enrolment. Students seeking exemption from practical work must do so within two weeks of the commencement of the semester in which the unit is taken.

Heads of School will:

- (i) consult with relevant course/strand coordinators and unit lecturers with regard to the application;
- (ii) respond to the application in writing; and
- (iii) forward a copy of their response to the course/strand coordinator and unit lecturer.

Heads of School will determine individual School policies on exemptions and these may be obtained from the School offices.

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