Bachelor of Applied Science / Bachelor of Laws (IX72)

Year offered: 2010
Admissions: Yes
CRICOS code: 066294B
Course duration (full-time): 5.5 years
Domestic fees (indicative): 2010: CSP $3,150 (indicative) per semester
International Fees (indicative): 2010: $11,000 (indicative) per semester
Domestic Entry: February
International Entry: February
QTAC code: 419712
Past rank cut-off: 92
Past OP cut-off: 5
OP Guarantee: Yes
Assumed knowledge: English (4, SA) and Maths B (4, SA)
Preparatory studies: For information on acquiring assumed knowledge visit http://www.studentservices.qut.edu.au/apply/ug/info/knowledge.jsp
Total credit points: 528
Standard credit points per full-time semester: 48
Course coordinator: Dr Perry Hartfield (Science and Technology); Dr Bill Dixon (Law)
Discipline coordinator: Dr Perry Hartfield (Biochemistry Major); Dr Marion Bateson (Biotechnology Major); Dr Robert Johnson (Chemistry Major); Dr Ian Williamson (Ecology Major); Dr Robin Thwaites (Environmental Science Major); Dr Emad Kiriakous (Forensic Science Major); Dr Gary Huftile (Geoscience Major); Dr Christine Knox (Microbiology Major); Dr Greg Michael (Physics Major)
Campus: Gardens Point

OP Guarantee
The OP Guarantee will apply to this course.

Career Outcomes
The defining nature of the QUT Bachelor of Laws is its real-world applied nature which will equip you with the high quality knowledge and skills that meet the needs of the legal profession, government, business and industry. In developing the LLB the Faculty recognises that graduates are increasingly seeking a broad range of careers including, but not limited to, legal practice.

The flexible nature of the degree provides students with an opportunity to undertake a series of elective streams. These streams group legal content and legal skills units into alignment with the varied career destinations which a legal education opens to graduates and will allow you to study areas of the law that match your career aspirations.

Career opportunities include private practice as a barrister and/or solicitor; work in government departments; employment as an in-house lawyer; and a range of other occupations.

As a graduate, you may enter legal practice with an education in both the content and process of science and data analysis that will enable you to deal with the complexities of litigation that have a scientific and technological dimension, such as inventions, trade secrets, quantitative evidence, and constitutional disputes giving rise to environmental issues. On the other hand, you may choose to follow a career path in the sciences, enhancing your opportunities in a particular discipline such as environmental science or biotechnology through your knowledge of the law.

Course Design
The course is designed to cover all major areas of the law as well as allowing students to choose any of the following science majors that are offered in the Bachelor of Applied Science (SC01) course: Biochemistry, Biotechnology, Chemistry, Ecology, Environmental Science, Forensic Science, Geoscience, Microbiology and Physics.

To complete the double degree in a shorter period of time, the co-major will be taken from the law program therefore it is not possible for students to choose any of the co-majors listed under the Bachelor of Applied Science course.

Professional Recognition
Graduates will satisfy the requirements of membership in the relevant professional body for their chosen science major. See the Bachelor of Applied Science (SC01) course for details.

The QUT Bachelor of Laws course is an approved degree for the purposes of the Legal Practitioners Admission Rules. Accordingly, it enables graduates to satisfy the academic requirements for admission to practise as a solicitor and/or barrister in all Australian states and territories. The QUT LLB degree qualification is also recognised for admission purposes in West and East Malaysia, Fiji and Papua New Guinea.

Further Information
For further information about this course, please contact the following:

Science Coordinator
Dr Perry Hartfield
Phone: +61 7 3138 2984
Email: p.hartfield@qut.edu.au
Law Coordinator
Dr Bill Dixon
Phone: +61 7 3138 2707

Discipline Coordinators

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Biotechnology
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Email: m.bateson@qut.edu.au

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Email: ra.johnson@qut.edu.au

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Email: r.thwaites@qut.edu.au

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Email: e.kiriakous@qut.edu.au

Geoscience
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Phone: +61 7 3138 4470
Email: g.huftile@qut.edu.au

Microbiology
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Phone: +61 7 3138 2301
Email: c.knox@qut.edu.au

Physics
Dr Greg Michael
Phone: +61 7 3138 1584
Email: g.michael@qut.edu.au

Deferment
QUT allows current Year 12 school leavers to defer their undergraduate admission offer for one year, or for six months if offered mid-year admission, except in courses using specific admission requirements such as questionnaires, folios, auditions, prior study or work experience.

Non-year 12 students may also request to defer their QTAC offer on the basis of demonstrated special circumstances.

Find out more on deferment.

Course structure - Law

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<thead>
<tr>
<th>Year 1, Semester 1</th>
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<tbody>
<tr>
<td>LWB145</td>
<td>Legal Foundations A</td>
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<tr>
<td>LWB238</td>
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<tr>
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<td>LWB239</td>
<td>Criminal Responsibility</td>
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<td>LWB240</td>
<td>Principles of Equity</td>
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<tr>
<td>LWB244</td>
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<td>LWB242</td>
<td>Constitutional Law</td>
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<td>LWB432</td>
<td>Evidence</td>
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<td>LWB431</td>
<td>Civil Procedure</td>
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### Year 5, Semester 2

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**Law Elective**

- Law Elective
- Law Elective
- Law Elective

### Year 6, Semester 1

- Law Elective
- Law Elective
- Law Elective
- Law Elective

**Law Electives**

Further information regarding Law Electives can be found at: http://www.law.qut.edu.au/study/courses/ugrad/lselect.jsp

**Transitional notes for students who have transferred from IF39 to IX72:**

* LWB142 and LWB144 are now law contextual elective units.
* LWB145 Legal Foundations A was LWB141 Legal Institutions and Method.
* LWB146 Legal Foundations B was LWB143 Legal Research and Writing (prerequisite LWB141).
* LWB147 Torts A was LWB138 Fundamentals of Torts.
* LWB148 Torts B was LWB139 Select Issues in Torts (prerequisite LWB138).
* LWB242 Constitutional Law was LWB231 Introduction to Public Law and LWB235 Australian Federal Constitutional Law.
* LWB243 Property Law was LWB236 Real Property A (prerequisite LWB143 & LWB240).
* LWB244 Property Law B was LWB237 Real Property B (prerequisite LWB236).
* LWB333 Theories of Law is now an elective unit.
* LWB335 Administrative Law was LWB331 Administrative is now (prerequisite LWB231).
* LWB434 Advanced Research and Legal Reasoning is now LWB435 Legal Research in Practice (prerequisite LWB143/LWB145) and it is now an elective unit.

Due to the restructure of the law course and the changes to the units required for admission purposes, the total number of elective units that students will be permitted to undertake will vary depending on the year of commencement and the number of units completed to date.

If you have not followed the standard course structure up to this point in time or are uncertain as to the correct number of electives available please contact the Law School Enquiries on (07)3138 2707 or email: law_enquiries@qut.edu.au.

### Course structure - Major in Biochemistry

**Year 1, Semester 1**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>SCB112</td>
<td>Cellular Basis of Life</td>
</tr>
<tr>
<td>MAB101</td>
<td>Statistical Data Analysis 1</td>
</tr>
<tr>
<td>MAB105</td>
<td>Preparatory Mathematics</td>
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**Year 2, Semester 1**

<table>
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<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tr>
<td>SCB120</td>
<td>Plant and Animal Physiology</td>
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<tr>
<td>SCB122</td>
<td>Cell and Molecular Biology</td>
</tr>
<tr>
<td>SCB110</td>
<td>Science Concepts and Global Systems</td>
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<tr>
<td>SCB111</td>
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**Year 2, Semester 2**

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<td>Physical Science Applications</td>
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<tr>
<td>SCB121</td>
<td>Chemistry 2</td>
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<tr>
<td>LQB381</td>
<td>Biochemistry: Structure and Function</td>
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<tr>
<td>LQB383</td>
<td>Molecular and Cellular Regulation</td>
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**Year 3, Semester 1**

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<th>Course Code</th>
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<tr>
<td>LQB481</td>
<td>Biochemical Pathways and Metabolism</td>
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<tr>
<td>LQB483</td>
<td>Molecular Biology Techniques</td>
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<tr>
<td>LQB581</td>
<td>Functional Biochemistry</td>
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<tr>
<td>LQB582</td>
<td>Biomedical Research Technologies</td>
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**Year 4, Semester 1**

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<th>Course Code</th>
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<td>LQB681</td>
<td>Biochemical Research Skills</td>
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<td>LQB682</td>
<td>Protein Biochemistry and Bioengineering</td>
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### Course structure - Major in Biotechnology

**Year 1, Semester 1**

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<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tr>
<td>SCB112</td>
<td>Cellular Basis of Life</td>
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Either
MAB101 Statistical Data Analysis 1
Or
MAB105 Preparatory Mathematics

Year 1, Semester 2
SCB120 Plant and Animal Physiology
SCB122 Cell and Molecular Biology

Year 2, Semester 1
SCB110 Science Concepts and Global Systems
SCB111 Chemistry 1

Year 2, Semester 2
SCB123 Physical Science Applications
SCB121 Chemistry 2

Year 3, Semester 1
LQB381 Biochemistry: Structure and Function
LQB383 Molecular and Cellular Regulation

Year 3, Semester 2
LQB483 Molecular Biology Techniques
LQB484 Introduction to Genomics and Bioinformatics

Year 4, Semester 1
Select TWO units from:
LQB583 Genetic Research Technology
LQB584 Medical Cell Biology
LQB585 Plant Genetic Manipulation

Year 4, Semester 2
Select TWO units from:
LQB682 Protein Biochemistry and Bioengineering
LQB684 Medical Biotechnology
LQB685 Plant Microbe Interactions

Course structure - Major in Chemistry

Year 1, Semester 1
SCB112 Cellular Basis of Life
Either
MAB101 Statistical Data Analysis 1
Or
MAB105 Preparatory Mathematics

Year 1, Semester 2
MAB120 Algebra and Calculus
SCB123 Physical Science Applications

Year 2, Semester 1
SCB110 Science Concepts and Global Systems
SCB111 Chemistry 1

Year 2, Semester 2
SCB121 Chemistry 2
SCB131 Experimental Chemistry

Year 3, Semester 1
PQB312 Analytical Chemistry for Scientists and Technologists
PQB331 Structure and Bonding

Year 3, Semester 2
PQB401 Reaction Kinetics, Thermodynamics and Mechanisms
PQB442 Chemical Spectroscopy

Year 4, Semester 1
PQB502 Advanced Physical Chemistry
PQB531 Organic Mechanisms and Synthesis

Year 4, Semester 2
PQB631 Advanced Inorganic Chemistry
PQB642 Chemical Research

Course structure - Major in Ecology

Year 1, Semester 1
SCB112 Cellular Basis of Life
Either
MAB101 Statistical Data Analysis 1
Or
MAB105 Preparatory Mathematics

Year 1, Semester 2
NQB201 Planet Earth
SCB120 Plant and Animal Physiology

Year 2, Semester 1
SCB110 Science Concepts and Global Systems
SCB111 Chemistry 1
## Year 2, Semester 2
- SCB123  Physical Science Applications
- NQB202  History of Life on Earth

## Year 3, Semester 1
- NQB321  Ecology
  - Plus either
  - NQB322  Invertebrate Biology
  - Or
  - NQB323  Plant Biology

## Year 3, Semester 2
- NQB421  Experimental Design
- NQB422  Genetics and Evolution

## Year 4, Semester 1
- NQB501  Environmental Modelling
- NQB502  Field Methods in Natural Resource Sciences

## Year 4, Semester 2
- NQB601  Sustainable Environmental Management
- NQB602  Environmental Chemistry

### Course structure - Major in Environmental Science

#### Year 1, Semester 1
- SCB112  Cellular Basis of Life
  - Either
  - MAB101  Statistical Data Analysis 1
  - Or
  - MAB105  Preparatory Mathematics

#### Year 1, Semester 2
- NQB202  History of Life on Earth
- SCB120  Plant and Animal Physiology

#### Year 2, Semester 1
- SCB110  Science Concepts and Global Systems
- SCB111  Chemistry 1

#### Year 2, Semester 2
- SCB123  Physical Science Applications
- SCB121  Chemistry 2

#### Year 3, Semester 1
- NQB302  Earth Surface Systems

#### Year 3, Semester 2
- NQB321  Ecology

#### Year 4, Semester 1
- NQB403  Soils and the Environment
- NQB421  Experimental Design

#### Year 4, Semester 2
- NQB601  Sustainable Environmental Management
- NQB602  Environmental Chemistry

### Course structure - Major in Forensic Science

#### Year 1, Semester 1
- SCB112  Cellular Basis of Life
  - Either
  - MAB101  Statistical Data Analysis 1
  - Or
  - MAB105  Preparatory Mathematics

#### Year 1, Semester 2
- SCB122  Cell and Molecular Biology
- SCB123  Physical Science Applications

#### Year 2, Semester 1
- SCB110  Science Concepts and Global Systems
- SCB111  Chemistry 1

#### Year 2, Semester 2
- SCB121  Chemistry 2
- SCB131  Experimental Chemistry

#### Year 3, Semester 1
- LQB383  Molecular and Cellular Regulation
- SCB384  Forensic Sciences - From Crime Scene to Court

#### Year 3, Semester 2
- JSB979  Forensic Scientific Evidence
- PQB312  Analytical Chemistry For Scientists and Technologists

#### Year 4, Semester 1
- PQB513  Instrumental Analysis
- PQB584  Forensic Physical Evidence
Course structure - Major In Geoscience

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<td>MAB101</td>
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<td>Preparatory Mathematics</td>
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<td>NQB202</td>
<td>History of Life on Earth</td>
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<td>NQB311</td>
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<td>NQB314</td>
<td>Sedimentary Geology</td>
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<td>NQB411</td>
<td>Petrology of Igneous and Metamorphic Rocks</td>
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<td>NQB412</td>
<td>Structural Geology and Field Methods</td>
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<td>NQB502</td>
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<td>Geophysics</td>
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Course structure - Major In Microbiology

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<td>LQB386</td>
<td>Microbial Structure and Function</td>
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<td>LQB587</td>
<td>Applied Microbiology 1: Water, Air and Soil</td>
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<td>Microbial Technology and Immunology</td>
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<td>LQB687</td>
<td>Applied Microbiology 2: Food and Quality Assurance</td>
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Course structure - Major in Physics

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<td>Algebra and Analytic Geometry</td>
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<td>PQB250</td>
<td>Mechanics and Electromagnetism</td>
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Aspects of microbiology impinge upon many facets of daily life, for example, human health, genetic engineering, the food industry and the built and natural environment. The unit introduces you to and provides you with a solid foundation in the basic microbiology required for progression to advanced studies in Microbiology. This unit provides knowledge about safe handling and study of microorganisms that is also very important in many other disciplines, because micro-organisms are used as models and tools in a wide range of study areas.

LQB386 MICROBIAL STRUCTURE AND FUNCTION

The word ‘forensic’ once meant anything relating to a law court. However today the term ‘forensic science’ refers to a whole new subject: it means using science to solve legal issues. As science, and the many sub-disciplines of science, are appearing in court with ever-increasing rapidity, there is a clear need for scientists to understand the foundations to the law, the ways in which law reasons, the adversarial process, and the basics to the key area of evidence law. The aim of this unit is first to provide you with an understanding of evidence law, with a particular emphasis upon the foundations to reception of scientific evidence, and the ways in which expert scientific witnesses are received in our courts. The unit aims to clarify the links between science and law, as well as to articulate the differences between these two increasingly inter-twined disciplines.

Equivalents: JSB937, JSB444  Credit points: 12  Contact hours: 3  Campus: Gardens Point and External  Teaching period: 2010 SEM-2

LQB383 MOLECULAR AND CELLULAR REGULATION

Molecular and Cellular Regulation is a second year unit and is a continuation and expansion of topics introduced in SCB112 Cellular Basis of Life and SCB122 Cell & Molecular Biology. Molecular and Cellular Regulation strengthens the focus on the molecular and genetic aspects of cellular processes and the consequences to the organism of failure of these basic processes. Topics taught relate to gene structure and regulation in prokaryotes and eukaryotes and the role of gene expression in the development of complex organisms. Related concepts such as cell signalling, communication, proliferation and survival are further developed in this unit.

Prerequisites: SCB121 or LS325  Antirequisites: LS325 and LS326  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

UNIT SYNOPSISES

JSB979 FORENSIC SCIENTIFIC EVIDENCE

The word ‘forensic’ once meant anything relating to a law court. However today the term ‘forensic science’ refers to a whole new subject: it means using science to solve legal issues. As science, and the many sub-disciplines of science, are appearing in court with ever-increasing rapidity, there is a clear need for scientists to understand the foundations to the law, the ways in which law reasons, the adversarial process, and the basics to the key area of evidence law. The aim of this unit is first to provide you with an understanding of evidence law, with a particular emphasis upon the foundations to reception of scientific evidence, and the ways in which expert scientific witnesses are received in our courts. The unit aims to clarify the links between science and law, as well as to articulate the differences between these two increasingly inter-twined disciplines.
LQB483 MOLECULAR BIOLOGY TECHNIQUES
Molecular biology and recombinant DNA technologies have important roles in many areas within the life sciences, including medicine, agriculture, cell biology, environmental science and forensics. Through close alignment of theoretical concepts and practical skills, this lab-based unit expands on molecular themes introduced in earlier cell and molecular biology units to develop expertise in modern recombinant DNA techniques and an understanding of strategies used to identify and manipulate genes. The close relationship between theory and practice in this unit is designed to develop competence, independence and critical thinking that will provide students with a solid foundation for advanced molecular biology studies presented in several third level units.

Prerequisites: LQB238 or SCB122
Antirequisites: LSB468, LSN468, LSN483
Assumed knowledge: LQB383 is recommended prior study
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 SEM-2

LQB484 INTRODUCTION TO GENOMICS AND BIOINFORMATICS
The completion of the Human Genome project, along with similar projects on other organisms of prokaryote and eukaryote nature, marked the beginning of a major revolution in fundamental biology that changed our understanding of the natural world. To understand how information on genome structure-function relationships (ie bioinformatics) is being used in areas such as gene discovery, disease diagnosis and drug development, students need to understand how the information content of DNA and proteins is extracted and analysed. This unit introduces students to the approaches to database mining and genome exploration.

Prerequisites: LQB483
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 SEM-2

LQB486 CLINICAL MICROBIOLOGY 1
Micro-organisms are very important as pathogens of humans and animals, and their accurate clinical diagnosis is essential for appropriate treatment and management of infections. This unit builds upon the foundational topics in microbiology that you learned in LQB386 (Microbial Structure and Function) and starts preparing you for a career in a microbiology laboratory in clinical practice, industry or research. The unit will advance your knowledge and skills in classical methods of isolation and identification of bacteria in clinical specimens and introduce aspects of microbial pathogenesis and antibiotic sensitivity. The unit will provide you with an understanding of clinically important viruses, and will commence your training in diagnostic parasitology.

Prerequisites: LQB386 or LSB328
Antirequisites: LSB537, LSB619, LSB469
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 SEM-2

LQB581 FUNCTIONAL BIOCHEMISTRY
This unit will study advanced biochemical concepts with a focus on metabolism, signalling pathways, systems and networks that coordinate and regulate the functional behaviour of cells and tissues.

Credit points: 12
Contact hours: 5 per week
Campus: Gardens Point
Teaching period: 2010 SEM-1

LQB582 BIOMEDICAL RESEARCH TECHNOLOGIES
This unit will study the technical principles and practical techniques that are essential for advancing research and development in biochemistry and biotechnology.

Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 SEM-1

LQB583 GENETIC RESEARCH TECHNOLOGY
The tools available for the discovery and manipulation of new genes are increasing exponentially and, in turn, this is having a significant impact in many areas of the life sciences. The true potential for this ultimately relies on the ability to link genes and their function. There are many strategies, both targeted and global, which facilitate an understanding of gene and genome structure function relationships. These strategies rely on integrated technologies based on molecular genetics, molecular biology and genetic engineering. The identification of function leads then to unlimited potential for detection and manipulation of these genes in human, animal and plant systems.

Prerequisites: LQB483
Credit points: 12
LQB584 MEDICAL CELL BIOLOGY
This unit builds and extends the understanding of basic theoretical and practical aspects of molecular cell biology developed in previous cell and molecular biology units. Medical Cell Biology develops and extends the context of the cellular environment and its central role within the organism providing all of the biological functions required by the organism to survive, defend and protect itself from disease and trauma. An understanding of cell biology theory and molecular mechanisms of animal development and disease is essential for introduction to higher level units in medical biotechnology.
Prerequisites: LQB383 or LSB338
Antirequisites: LSB449, LSB503, LSN584
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 SEM-1

LQB585 PLANT GENETIC MANIPULATION
The potential of plant biotechnology can only be recognised as a result of the significant advances being made in technologies enabling the genetic manipulation of plants. Familiarity with the strategies, techniques and breadth of applications is essential as a basis for anyone planning a career in plant biotechnology. The unit is designed with a significant emphasis on achieving technical expertise in plant genetic manipulation and control of gene expression.
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 SEM-1

LQB586 CLINICAL MICROBIOLOGY 2
TBA
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 SEM-1

LQB587 APPLIED MICROBIOLOGY 1: WATER, AIR AND SOIL
Issues relating to microbial populations within the environment are of great interest and relevance to the community, and also to scientists. Building on the foundation of basic microbiology, in this advanced level unit you will gain a strong understanding of the nature of microbial populations in water, air and soil, and their importance to the human population. This unit is issues-based, encouraging a problem solving approach as you investigate/study microbial pollution, bioremediation, biogeochemical cycles and a healthy environment. You will gain knowledge and skills in analysis and interpretation of water, air and soil populations, which will permit you to investigate real-world problems.
Prerequisites: LQB386, LSB328, or LSB492
Equivalents: LSB528
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 SEM-1

LQB588 MEDICAL CELL BIOLOGY
This unit builds and extends the understanding of basic theoretical and practical aspects of molecular cell biology developed in previous cell and molecular biology units. Medical Cell Biology develops and extends the context of the cellular environment and its central role within the organism providing all of the biological functions required by the organism to survive, defend and protect itself from disease and trauma. An understanding of cell biology theory and molecular mechanisms of animal development and disease is essential for introduction to higher level units in medical biotechnology.
Prerequisites: LQB383 or LSB338
Antirequisites: LSB449, LSB503, LSN584
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 SEM-1

LQB680 FORENSIC DNA PROFILING
The unit covers the evolution of DNA typing from restriction fragment length polymorphism (RFLP) DNA "fingerprinting" to short tandem repeat (STR) analysis using multiplex PCR-based systems for human identification, the principles of single nucleotide polymorphism (SNP) technology, mitochondrial DNA analysis and future trends for forensic DNA analysis.
Prerequisites: SCB384
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2010 SEM-2

LQB681 BIOCHEMICAL RESEARCH SKILLS
In the real world, the design and completion of successful research and/or business projects demand that individuals gather information, solve problems, work effectively as a part of a team and analyse and communicate results in a critical manner. This unit offers opportunities for you to develop these skills that are valued highly by potential employers and research project leaders. This unit is a capstone biochemistry unit designed to prepare you as a prospective graduate for independent and group research.
Prerequisites: LQB381 or LSB308. Students with equivalent study can apply for a requisite waiver.
Equivalents: LSB607
Credit points: 12
Contact hours: 5 per week
Campus: Gardens Point
Teaching period: 2010 SEM-2

LQB682 PROTEIN BIOCHEMISTRY AND BIOENGINEERING
This unit is designed to give you the essential concepts and techniques driving research and industrial biotechnology so that you will be equipped for multiple careers in the biological sciences. The skills you develop will allow you to enter a practical laboratory environment or to apply your knowledge in related areas of evaluations of technologies and intellectual property.
Prerequisites: LQB381 or LSB308 or LSN101 and LSN102
Antirequisites: LSB605, LSB608
Credit points: 12
Contact hours: 5 per week
Campus: Gardens Point
Teaching period: 2010 SEM-2

LQB686 MICROBIAL TECHNOLOGY AND IMMUNOLOGY
Increasingly microbiologists are employing emerging technologies to rapidly detect, localise, characterise and identify microorganisms to gain a greater understanding of their prevalence, distribution, physiological functions, genotypes/phenotypes and pathogenesis. This unit will extend your knowledge of the origins of microorganisms and recently sequenced microbial genomes, and provide you with the necessary knowledge for the development and application of emerging microbial technologies. The study of
microorganisms is enhanced by an understanding of the host immunological response(s) to microbial colonisation and disease.

**Prerequisites:** LQB386 and LQB483  
**Antirequisites:** LSB648  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**LQB687 APPLIED MICROBIOLOGY 2: FOOD AND QUALITY ASSURANCE**

This unit covers the most significant areas of food microbiology at an advanced level. Topics include: microbial ecology of foods; microbial spoilage and food preservation; foodborne microorganisms of public health significance; food fermentations; laboratory and food processing operations and certification; predictive microbiology; agiterrorism; and isolation, quantification and identification of microbes from foods. A professional work attitude in a microbiology laboratory, practical, applied laboratory skills and an awareness of the hazards of working with pathogenic cultures are established.

**Prerequisites:** LQB386 or LSB328  
**Assumed knowledge:** Completion of 72 credit points of second level science units is assumed knowledge  
**Equivalents:** LSB628  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**LWB136 CONTRACTS A**

This unit includes the following: formation of contracts; equitable estoppel; privity of contract; formalities; express and implied terms; an examination of promises which are legally binding; how contractual promises may be characterised and the significance of that characterisation.

**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point and External  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**LWB137 CONTRACTS B**

Legally binding promises pervade society, from uncomplicated bargains like riding on a bus to complex multi-million dollar transactions. The law of contract provides an understanding of promises which are legally binding, how contractual promises may be characterised and the significance of that characterisation, and how contractual promises may be discharged or invalidated. This is the second of two associated units which examine the law of contract, the focus of this unit being on the discharge of contracts, remedies for breach and the invalidation of contracts. The two units together provide the foundation for several units encountered later in the course.

**Prerequisites:** LWB136  
**Credit points:** 12  
**Contact hours:** 3 hours per week  
**Campus:** Gardens Point and External  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**LWB145 LEGAL FOUNDATIONS A**

The unit aims to provide foundational knowledge about law and legal concepts, the Australian legal system and constitution, sources of law (including their purpose and use) and the ethical underpinnings of the law and legal profession. The unit also aims to introduce, within real world contexts, the essential legal skills of case analysis, problem solving, legal writing, legal reasoning, legal research and statutory interpretation to enable students to progress in their study of law.

**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point and External  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**LWB146 LEGAL FOUNDATIONS B**

The aim of this unit is for you to further develop, within real world contexts, the skills in legal research, analysis, problem solving and writing that were introduced in LWB145 Legal Foundations A. This aim is directed towards ensuring that by the end of the first year of your law degree you are able to perform tasks required to progress your study of law and that you can reflect on the continued development of your legal research and writing skills to equip you with the skills required in legal practice.

**Prerequisites:** LWB141 or LWB145  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point and External  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**LWB147 TORTS A**

The aims of this unit are for you to develop an understanding of the law of torts relating to trespass, negligence and workers’ compensation and the underlying principles and policies that influence the development of torts law. Further, this unit aims to demonstrate how the law of torts works in a real world context, with particular focus on legal problem solving and the teaching of legal interviewing skills. The unit will practise and develop the foundational legal skills introduced in LWB145 Legal Foundations A.

**Corequisites:** LWB145  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point and External  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**LWB148 TORTS B**

This unit aims to build upon the knowledge, understanding and skills developed in Torts A through a more in-depth examination of a wider range of torts and related issues. It also aims to equip you with a more detailed and sophisticated knowledge and understanding of how this area of the law is likely to develop in the 21st Century. Integral to this is the development of your skills, necessary for the practice of law and your further studies of law, in legal problem solving, research and written communication and an understanding of ethical issues related to the practice of law.

**Prerequisites:** LWB138 or LWB147  
**Corequisites:**
LWB146    Credit points: 12    Contact hours: 3 per week    
Campus: Gardens Point and External    
Teaching period: 2010 SEM-1 and 2010 SEM-2

LWB238 FUNDAMENTALS OF CRIMINAL LAW
An understanding of the principles of Criminal Law is of fundamental importance as it impinges upon almost every aspect of domestic, commercial, corporate and public activity in Queensland. The aim of this unit is to provide an overview of the aims and sources of Criminal Law in Queensland and to develop an understanding of the onus of proof in criminal matters. Additionally the unit explores the concept of fault elements, the criminal justice system and a selection of major offences while also developing advocacy skills.

Corequisites: LWB145    Credit points: 12    Contact hours: 3 per week    
Campus: Gardens Point and External    
Teaching period: 2010 SUM-2 and 2010 SEM-1

LWB239 CRIMINAL RESPONSIBILITY
The aim of this unit is to build upon the principles and skills explored in LWB238 by developing an understanding of the way criminal responsibility is imposed through the complicity provisions of the Criminal Code and the common law and how the major defences and excuses operate. The unit also examines the major sentencing principles applied in Queensland.

Prerequisites: LWB238    Credit points: 12    Contact hours: 3 per week    
Campus: Gardens Point and External    
Teaching period: 2010 SEM-2

LWB240 PRINCIPLES OF EQUITY
The principles of Equity were originally developed to ameliorate the harshness of the common law and have since become a fundamental component of our legal system. A knowledge and understanding of the major principles of equity are necessary to an understanding of how the Australian legal system operates; it is therefore located early in the LLB degree. The aim of this unit is to provide a coherent knowledge and understanding of equitable principles within the context of the Australian legal system as well as developing skills relevant to ongoing learning and professional practice.

Credit points: 12    Contact hours: 3 per week    
Campus: Gardens Point and External    
Teaching period: 2010 SEM-1 and 2010 SUM

LWB241 TRUSTS
Trusts are a fundamental institution of ownership of property in equity; they are used for various purposes including estate planning, commercial and charitable purposes. A knowledge and understanding of the trust in its various forms and the equitable principles of property transfer are fundamental in understanding the impact of the principles of equity in the area of property ownership and rights. The aim of this unit is to provide a coherent knowledge and understanding of the law relating to trusts within the context of the Australian legal system and to develop skills relevant to ongoing learning and professional practice.

Credit points: 12    Contact hours: 3 per week    
Campus: Gardens Point and External    
Teaching period: 2010 SEM-2 and 2010 SUM

LWB242 CONSTITUTIONAL LAW
The aim of the unit is to provide knowledge and understanding of the constitutional arrangements effected by the Commonwealth Constitution and the State Constitutions, including the structure and institutions of the Constitutions, the division of power between Commonwealth and States, and relations between the different levels of government.

Credit points: 12    Contact hours: 3 per week    
Campus: Gardens Point and External    
Teaching period: 2010 SUM-2, 2010 SEM-1 and 2010 SEM-2

LWB243 PROPERTY LAW A
The aim of the unit is to provide you with an understanding of the legal principles relating to real and personal property and how these rules operate in a modern legal system. The unit also aims to develop the skills, necessary for the practice of law and your further studies of law, in legal problem solving and reasoning and oral and written communication.

Prerequisites: LWB137 and (LWB148 or LWB139)    Credit points: 12    Contact hours: 3 per week    
Campus: Gardens Point and External    
Teaching period: 2010 SEM-1

LWB244 PROPERTY LAW B
This unit aims to build upon the knowledge, understanding and skills that you acquired in LWB243 Property Law A by further developing your understanding of property law relating to leases, mortgages, co-ownership, community title, easements, profits a prendre and freehold and statutory covenants. It also aims to equip you with an understanding of how this area of the law is likely to develop in the 21st Century. Integral to this is the development of your skills of problem solving, research, writing and drafting which are necessary for the practice of law and your further studies of law, in legal problem solving, research, written communication and drafting.

Prerequisites: LWB243 and LWB146    Credit points: 12    Contact hours: 3 per week    
Campus: Gardens Point and External    
Teaching period: 2010 SEM-2

LWB334 CORPORATE LAW
This unit includes the following: the basic legal principles relating to registered companies; the principle of the veil of incorporation; internal functioning of a registered company including the operation of the constitution and replaceable...
rules; dealings with third parties; legal rules relating to share capital; dividends and loan capital; introduction to obligations of company officers and shareholder rights. Further specialised units such as Law of Corporate Governance are offered for students who have completed Corporate Law and wish to concentrate some of their studies in the corporations and commercial area.

Prerequisites: (LWB143 or LWB146) and (LWB237 or LWB243) Credit points: 12 Contact hours: 3 per week in Sem 2. Campus: Gardens Point and External
Teaching period: 2010 SEM-2 and 2010 SUM

LWB335 ADMINISTRATIVE LAW
To enable you to develop a working knowledge of administrative law at both the state and federal level as well as a broader understanding of the role and function of this area of law in balancing administrative efficiency and legitimate government interests against the requirements of accountability in executive decision-making.

Prerequisites: LWB242 Credit points: 12 Contact hours: 3 per week Campus: Gardens Point and External Teaching period: 2010 SEM-1

LWB431 CIVIL PROCEDURE
This core unit focuses on developing basic litigation skills. The following issues are examined: the adversarial system and alternative methods of dispute resolution, obligations to the client, the structures and processes of litigation conducted in the Supreme, District and Magistrates Courts, jurisdiction, originating process, notice of intention to defend, parties, service, ending proceedings early, pleading, disclosure, subpoenas, trial, appeals, costs and enforcement.

Prerequisites: 192 Credit Value in spk(s): LWB% Credit points: 12 Contact hours: 3 per week Campus: Gardens Point and External Teaching period: 2010 SEM-1 and 2010 SUM

LWB432 EVIDENCE
The law of Evidence concerns those rules and principles which govern the presentation and proof of facts and information in court proceedings, both civil and criminal. The unit covers both State and Federal jurisdictions. NB: External only in Semester Two.

Prerequisites: LWB238 Credit points: 12 Contact hours: 3 per week Campus: Gardens Point and External Teaching period: 2010 SEM-1

LWB433 PROFESSIONAL RESPONSIBILITY
This unit includes the following: the ethical principles upon which the practice of all professions is based; the principles which underpin the discipline of law and the workings of the legal profession; the history, nature, organisation and operation of the legal profession; codes of conduct, trust accounts and professional legal ethics.

Prerequisites: 192 Credit Value in spk(s): LWB% Credit points: 12 Contact hours: 3 per week in Sem 2. Campus: Gardens Point and External Teaching period: 2010 SEM-2

MAB101 STATISTICAL DATA ANALYSIS 1
Experiments, observational studies, sampling, and polls; data and variables; framework for describing and manipulating probability; independence; Binomial and Normal distributions; population parameters and sample statistics; concepts of estimation and inference; standard error; confidence intervals for means and proportions; tests of hypotheses on means and proportions (one sample and two independent samples); inference using tables of counts; modelling relationships using regression analysis; model diagnosis; use of statistical software.

Antirequisites: BSB123, EFB101, MAB141, MAN101
Assumed knowledge: Grade of at least Sound Achievement in Senior Mathematics B (or equivalent) or MAB105 is assumed knowledge. Credit points: 12 Contact hours: 4 per week Campus: Gardens Point
Teaching period: 2010 SUM-2, 2010 SEM-1 and 2010 SEM-2

MAB105 PREPARATORY MATHEMATICS
This unit is a substitute for Senior Mathematics B for those students who need the equivalent background for the successful study of units which assume it. It includes: basic number facts, natural numbers, integers, rational numbers, real numbers and their operations; basic algebra; functions and equations, graphs, linear functions, equations and applications; systems of linear equations; quadratic, exponential, logarithmic and trigonometric functions, properties and applications; introduction to calculus; rates of change, derivatives, rules of differentiation, second derivatives, maxima and minima and applications; integration and applications. This unit is incompatible with an exit assessment of High Achievement or better in Senior Mathematics B.

Assumed knowledge: Year 10 Level 6 Mathematics is assumed knowledge Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SUM-2, 2010 SEM-1 and 2010 SEM-2

MAB120 ALGEBRA AND CALCULUS
This unit introduces and reviews the elementary concepts of function, calculus, matrices and vectors with special reference to applications in science, technology and business where appropriate. Topics covered include the algebra of complex numbers, elementary functions (polynomial, trigonometric, exponential and logarithmic) and their properties, differentiation and integration methods and principles, geometric and algebraic applications of vectors and the solution of linear systems using matrices.

Assumed knowledge: Grade of at least Sound
Achievement in Senior Mathematics B (or equivalent) or MAB105 is assumed knowledge  
Equivalents: MAB100, MAB125, MAB180  
Credit points: 12  
Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2010 SEM-1 and 2010 SEM-2

MAB121 CALCULUS AND DIFFERENTIAL EQUATIONS
This unit extends the areas of function and calculus introduced in MAB120 by introducing series representations for functions and more advanced methods of differentiation and integration for functions of one variable. A strong connection to real world problems is made by introducing the use of differential equations in modelling, and exploring appropriate methods of solution. Practical calculations of volumes and surface areas of solids of revolution extend your interpretations of the definite integral. Taylor and Fourier series are introduced as a means of approximating functions by sums of polynomials and periodic functions. Some more advanced methods for indefinite integrals, such as partial fraction decomposition, are also introduced.  
Assumed knowledge: Grade of at least Sound Achievement in Senior Mathematics C (or equivalent) or MAB125 or MAB180 or MAB120 is assumed knowledge  
Equivalents: MAB111, MAB126  
Credit points: 12  
Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2010 SEM-1, 2010 SEM-2 and 2010 SUM

MAB122 ALGEBRA AND ANALYTIC GEOMETRY
This unit extends your knowledge in the areas of functions, calculus, matrices and vectors introduced in MAB120 by introducing functions of more than one variable, partial derivatives and multiple integrals, vector valued functions, and matrix methods for the solution of large systems of linear equations.  
Equivalents: MAB112, MAB127, MAB132  
Credit points: 12  
Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2010 SEM-1, 2010 SEM-2 and 2010 SUM

MAB220 COMPUTATIONAL MATHEMATICS 1
This unit includes: sources of error; computer arithmetic; solution of nonlinear equations in one variable; solution of systems of linear equations; interpolation; finite differences; numerical differentiation and integration; solution of first order linear differential equations; MATLAB programming. Students without an exit level of Sound Achievement in four semesters of Senior Mathematics C need to be concurrently enrolled in MAB100 if not completed earlier.  
Assumed knowledge: Grade of at least Sound Achievement in Senior Mathematics B (or equivalent) or MAB105 and corequisite MAB120 or MAB125 or MAB100 or MAB180 if you don't have Senior Mathematics C is assumed knowledge  
Credit points: 12  
Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2010 SEM-1 and 2010 SEM-2

MAB311 ADVANCED CALCULUS
This unit includes the following: polar coordinates; parametric equations; conic sections; quadric surfaces; vector-valued functions; Fourier series; functions of several variables; graphs; partial derivatives; total derivatives; extrema; Lagrange multipliers; Taylor series for multivariable functions; double and triple integrals; Green's theorems; line and surface integrals; divergence theorem; Stoke's theorem; applications.  
Prerequisites: (MAB111 or MAB121) and (MAB112 or MAB122)  
Credit points: 12  
Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2010 SEM-1

NQB201 PLANET EARTH
Earth Science impacts every aspect of modern life. Hence, the concepts of Earth Science are fundamental not only to the field of Geology, but also to Environmental Science, natural resource management, civil engineering and society at large. Planet Earth provides an introduction to Earth Science, including earth materials, geologic history, geological process at the Earth's surface, and the complex interplay between the lithosphere, atmosphere, hydrosphere and biosphere through geologic time. Thus, Planet Earth is a foundation unit for further studies in Geology and Environmental Science and also serves as a broad introduction to the world we live on.  
Equivalents: NRB230  
Credit points: 12  
Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2010 SEM-2

NQB202 HISTORY OF LIFE ON EARTH
This unit provides an introduction to the history and development of life on Earth with an emphasis on fundamental biological and ecological principles as they have operated through geological time. The unit provides the student with an understanding of the processes of evolution, extinction and the changing environmental conditions through Earth's history. The unit provides the student with practical experience in fossil identification, classification and morphological interpretation. It provides the student with a "deep-time" perspective of climate and other environmental changes affecting modern ecosystems. Hence, History of Life on Earth is a foundation unit for the Earth and Environmental Sciences as well as Ecology, Biological Sciences and Education.  
Equivalents: NRB240  
Credit points: 12  
Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2010 SEM-2

NQB302 EARTH SURFACE SYSTEMS
Understanding long and short term climate and environmental change is now recognised as crucial to the interpretation of our biotic, geomorphic and cultural
grounding in ecology for students from all faculties; and laying the conceptual foundation for later subjects in the ecology and environmental science.

**Prerequisites:** SCB110 or SCB112  
**Equivalents:** NRB311

**NQB322 INVERTEBRATE BIOLOGY**

Anyone pursuing a career as an ecologist, environmental biologist, or teacher needs to be familiar with invertebrates, including their diversity and how they function. Because approximately 90% of all invertebrates are arthropods, this unit focuses on this dominant phylum, which includes all the animals with jointed exoskeletons (the insects, prawns and crabs, spiders, millipedes and more). The aim is to provide you with an overview of arthropod diversity, structure and function, as a basis for exploring the role of arthropods in natural and human-modified systems.

**Equivalents:** NRB370  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**NQB323 PLANT BIOLOGY**

This unit will provide an understanding and appreciation of plants by taking an evolutionary approach to the study of major plant groups. Content includes life cycles, morphology, adaptations for survival in varied environments, economic and ecological aspects of various groups as they relate to humans, phylogeny and diversity of major groups. This unit will encourage careful observation, curiosity and thinking about plants. The practicals will provide an opportunity to observe and understand form, function and diversity and will emphasise development of skills in plant systematics and identification, with special emphasis on Australian flora.

**Prerequisites:** SCB112  
**Equivalents:** NRB371

**NQB403 SOILS AND THE ENVIRONMENT**

Soils are the most dynamic component of Earth surface processes, being the interface of the lithosphere and the atmosphere and a key system within the biosphere and the hydrosphere. It is, therefore, one of the most critical resources to consider within the context of climate change. This unit will provide you with grounding in soil science by emphasising pedological principles, their application to environmental soil analysis and management, and knowledge of ecosystem function of soils in a changing environment. The unit would provide experience in describing and classifying soils and soil materials as well as field experience in the investigation of soil processes and the assessment of resource potential and environmental hazard.

**Prerequisites:** NQB302 or NRB301 or (ENB272 and
ENB274) Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-2

NQB411 PETROLOGY OF IGNEOUS AND METAMORPHIC ROCKS
This unit includes an introduction to the description, classification and origin of igneous and metamorphic rocks and practical development of lithologic and petrographic abilities to identify mineral assemblages, classify rocks, and interpret textures. Field and theoretical constraints on the petrogenesis of rocks are discussed in lecture. Field study is an essential component of the unit. This unit builds upon the knowledge and skills acquired in the prerequisite unit (NQB311 Mineralogy).
Prerequisites: NQB311 or NRB333 Equivalents: NRB436 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-2

NQB412 STRUCTURAL GEOLOGY AND FIELD METHODS
Structural geology, the deformation of earth materials, is one of the main elements in the core curriculum in geology. It is also essential to other subdisciplines of geology, such as foundation engineering and petroleum and mineral exploration. Geologists need to be able to describe and map structures, to understand the mechanical principles of rock deformation, and to be able to manipulate and calculate structural data.
Prerequisites: NQB314 or NRB331 Equivalents: NRB434 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-2

NQB421 EXPERIMENTAL DESIGN
An understanding of experimental design is essential for students and professionals in the ecological and environmental sciences as many biological systems are characterised by high levels of variability. This unit emphasises practical considerations of field and laboratory-based experimentation in ecology and environmental science, and provides experience in problem assessment, definition, formulation of testable hypotheses and experimental design.
Prerequisites: MAB101 or MAB104 or MAB105, and NQB321 or NRB311 Equivalents: NRB412 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-2

NQB422 GENETICS AND EVOLUTION
This unit provides a basic understanding of the mechanisms of inheritance using Mendelian Genetics as a foundation. These principles are extended to develop a clear understanding of the mechanisms and processes that drive evolution in natural populations. Topics include the physical basis of heredity, Mendelian and non-Mendelian inheritance patterns, genotype/environment interactions, quantitative traits, evolutionary theory, adaptation and natural selection, speciation and phylogeny, sexual selection and the evolution of life histories.
Prerequisites: SCB112 Equivalents: NRB410 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-2

NQB501 ENVIRONMENTAL MODELLING
The capacity for management of complex environmental problems such as climate change, now and in the future, will rely on the capacity of environmental managers to create, interpret and critically analyse models of environmental systems. Mathematical model building promotes the capacity to understand the interdependent relationships that characterise environmental systems and also provides a quantitative foundation for informed environmental management.
Prerequisites: NQB412 or NQB421 Assumed knowledge: 48 credit points of second level science units is assumed knowledge. Equivalents: NRB500 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-1

NQB502 FIELD METHODS IN NATURAL RESOURCE SCIENCES
Field experience is an essential part of the professional training of geologists, environmental scientists, ecologists, and natural resource specialists in general. The theory and practice of methods to interpret, measure, map, and monitor important natural resource features and characteristics are essential to the study of geological, ecological and environmental systems. Methods of survey, mapping and interpretation are necessary skills for resource assessment, geo-exploration, environmental impact assessment, land evaluation, baseline studies, and ecological investigations. There are varying emphases on these outcomes depending on the type of field survey you undertake in this unit.
Prerequisites: (NQB321 or NQB411) and (NQB302 or NQB412) Assumed knowledge: 36 credit points of second level science units in selected major is assumed knowledge. NQB302 and NQB403 for Env Sc, NQB321 for Ecol, NQB411 and NQB412 for Geosc Equivalents: NRB601 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-1

NQB513 GEOPHYSICS
Geophysics is an integral branch of geology, providing many of the most useful methods of imaging the subsurface of the earth. These methodologies are useful in disciplines as diverse as plate tectonics, oil and mineral exploration, hydrogeology, environmental geology, engineering geology, and seismic hazards.
Prerequisites: (NQB201 or NRB230) and (NQB412 or NRB434) Equivalents: NRB534 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point
Teaching period: 2010 SEM-1

NQB521 POPULATION GENETICS AND MOLECULAR ECOLOGY
This unit is an extension of NQB422 Genetics and Evolution. Topics include the genetic structure of populations and processes of evolutionary change; natural selection, inbreeding and adaptation, species and speciation theory; ecological genetics; the genetics of behaviour.
Prerequisites: NQB422  Antirequisites: NRB510
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

NQB523 POPULATION MANAGEMENT
This unit develops the theoretical treatment of populations as a unit of study and integrates the content of previous ecology units into approaches for the management of biological populations. The unit focuses on those interactions that are most relevant to pest control, but the unit is also of fundamental importance to harvesting and conservation biology.
Prerequisites: NQB321, NQB421  Antirequisites: NRB511
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

NQB601 SUSTAINABLE ENVIRONMENTAL MANAGEMENT
Sustainable environmental management requires a multidisciplinary approach to decision-making. This approach must be founded on scientific knowledge about the environment, but to be effective, the science must also be integrated with social, economic, political and technological policies. This unit explores contemporary environmental management issues: the science behind them, linkages between them, their cultural settings and sustainable solutions.
Assumed knowledge: 48 credit points of second level science units is assumed knowledge  Equivalents: NRB600
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

NQB602 ENVIRONMENTAL CHEMISTRY
This unit includes the following: design and quality control of physicochemical monitoring programs; fundamentals of data analysis; methodologies of monitoring (variables, instruments, sampling strategies including location and frequency of observation, analytical protocols); introduction to biogeochemical cycles; the relationships between molecular structures and environmental properties; hazardous substances in the environment; chemistry of natural water bodies, including solutes and equilibria; chemistry of water pollutants; indicators of water quality; the atmosphere - structure and energy balance; air pollutants.
Prerequisites: PCB140 or PCB142 or SCB111 or SCB121

Assumed knowledge: 72 credit points of Science and/or Health units is assumed knowledge  Equivalents: NRB440
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

NQB614 GROUNDWATER SYSTEMS
This unit focuses on the origin, occurrence and movement of groundwater; aquifer properties; chemistry and quality of groundwater; exploration methods for groundwater; drilling methods and well testing equipment; assessment of groundwater problems, both supply and quality; and introduction to modelling of groundwater systems. Groundwater resources of Australia are covered and current issues. Lectures are supported by desktop exercises. Students will obtain practical experience with pump tests and computer modelling. There is interaction with government and private sector hydrogeologists, and a field site visit for hands-on well testing.
Prerequisites: NQB302 or NRB301 or ENB383  Equivalents: NRB633
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

NQB615 GEOCHEMISTRY
Through lecture, discussion and problem solving exercises, this unit introduces the application of geochemistry, phase equilibria, and thermodynamics to demonstrate the origin and evolution of igneous and metamorphic rocks. Problem-solving exercises synthesise field, petrographic and geochemical data to develop quantitative petrogenetic models and enhance critical thinking and written communication skills. Field study is an important component of this unit.
Equivalents: NRB536
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

NQB622 CONSERVATION BIOLOGY
Conservation Biology is the application of ecological theory and principles to the problem of the maintenance of viable populations of rare, threatened or endangered species, or ecological systems. The unit integrates ecological and genetic material covered in earlier units to provide an understanding of factors that enable the maintenance or enhancement of populations. The unit examines biodiversity and its determinants, the process of extinction, population viability analysis and the diagnosis and treatment of population declines, habitat fragmentation, metapopulation processes and the design of natural reserves, and conservation genetics.
Prerequisites: NQB321 or NRB311, and NQB422 or NRB410  Equivalents: NRB611
Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2
NQB623 ECOLOGICAL SYSTEMS
This unit integrates the content of other ecology units into applied approaches to the management of populations and systems. The unit employs concepts from population ecology, population management and conservation biology and builds methodologies and concepts necessary for an applied approach to conservation and pest management. A field trip provides the vehicle for developing these themes. Content includes collection, collation and preparation of biological resource material relevant to a case study, diagnostic features and identification of species of relevance, factors involved in the design of a large-scale field study, field techniques necessary for understanding species/habitat interactions, and the analysis and interpretation of large field data sets.
Prerequisites: NQB321 or NRB311  Credit points: 12
Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

PQB250 MECHANICS AND ELECTROMAGNETISM
The experimental means by which we have arrived at our modern understanding of the universe is central to the scientific philosophy. Students of physics and physics related areas need to possess skills in quantitative handling, processing, communication and evaluation of data. Higher level studies in specialised areas of Physics require a familiarity with a range of fundamental topics in Physics and an ability to apply critical thinking and advanced mathematical techniques to the analysis and solution of Physical problems. This first-level unit lays the foundation for these higher level studies by introducing the fundamental topic areas of mechanics and electromagnetism.
Assumed knowledge: Senior Maths B is assumed knowledge.  Credit points: 12  Contact hours: 4.5 hours per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

PQB251 WAVES AND OPTICS
Wave phenomena are used to describe and explain many of the physical processes in the universe. Sound and light are the most commonly experienced of these and have far-reaching human applications, including their use as experimental tools for science. The study of wave phenomena has led to the development of quantum mechanics, a cornerstone of modern scientific thought. This first-level unit lays the foundation for discussion of wave phenomena in higher level studies, but will also be relevant to those not considering progressing to a Physics major but wishing to understand more of the Physical world in which we live.
Assumed knowledge: Senior Maths B is assumed knowledge.  Credit points: 12  Contact hours: 4.5 hours per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

PQB312 ANALYTICAL CHEMISTRY FOR SCIENTISTS AND TECHNOLOGISTS
Reliable chemical analysis and testing is fundamental to the functioning of our society. This generic unit is designed for future scientists and technologists in the fields of chemistry, forensic science and other similar sciences. It introduces students to concepts of quality assurance, good laboratory practice and the vital instrumental areas of analysis – chromatography and spectroscopy. Laboratory work is a key extensive activity in this unit.
Prerequisites: SCB131  Equivalents: PCB414  Credit points: 12  Contact hours: 4.5 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1 and 2010 SEM-2

PQB331 STRUCTURE AND BONDING
This unit provides detailed coverage of the theories of bonding in organic, inorganic and coordination compounds including orbital hybridisation valence bond theory, coordination theory and crystal field theory. The cause and effect relationships between bonding and structure are developed leading to an understanding of structural variability, chirality, and other modes of isomerism for a broad range of chemical compounds. An introduction to molecular symmetry, which is central to the study of molecular geometry and shape, also provides the background for later studies in spectroscopy. Lectures are complemented by 7 laboratory experiments and 4 hands-on style workshops.
Prerequisites: SCB121 and SCB131  Antirequisites: PCB334, PCB354  Credit points: 12  Contact hours: 4.5 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

PQB350 THERMODYNAMICS OF SOLIDS AND GASES
This unit provides students with an overview of the basic thermodynamic principles that describe how heat and other forms of energy are transported through matter in its solid and gaseous states. Through integrated lecture and practical classes, it provides students with a foundation for more advanced studies later in areas such as condensed matter physics and quantum mechanics. The three areas of study in this unit; thermodynamics, solid state physics and statistical physics; are essential core topics if students are considering postgraduate study in the physical sciences or professional employment as a physicist.
Prerequisites: PQB250 or PCB250, and MAB111  Corequisites: MAB311  Assumed knowledge: Students should enrol in MAB311 in the same semester if not already completed  Equivalents: PCB562  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1
PQB401 REACTION KINETICS, THERMODYNAMICS AND MECHANISMS
This unit deals with the way in which the fundamental concepts of physical chemistry govern the extent and rates of chemical reactions and applies them to actual reaction types from the fields of organic and inorganic chemistry. Topics include: thermodynamics including enthalpy, heat capacity, entropy, Gibbs free energy, chemical equilibria and an introduction to electrochemistry; chemical kinetics including rate laws, mechanisms of chemical reactions, collission theory of reaction rates and the steady state principle as well as acids and bases in both aqueous and non aqueous environments.
Prerequisites: PQB331    Antirequisites: PCB354, PCB405    Credit points: 12    Contact hours: 4.5 per week    Campus: Gardens Point    Teaching period: 2010 SEM-2

PQB442 CHEMICAL SPECTROSCOPY
Spectroscopic techniques are now widespread in scientific laboratories. An appreciation of both the principles and practice of spectroscopy is essential for those contemplating a career in chemistry. The use of spectroscopic methods to elucidate molecular structure provides an excellent vehicle for training in the scientific method, particularly the logical application of experimental data to deduce the solution to a complex problem. Whilst the fundamental theoretical concepts will be dealt with in the early part of the unit, later emphasis will be on developing practical skills in problem solving, a skill of value to all fields of scientific and technological endeavour.
Prerequisites: PQB331    Equivalents: PCB444    Credit points: 12    Contact hours: 4 per week    Campus: Gardens Point    Teaching period: 2010 SEM-2

PQB450 ENERGY, FIELDS AND RADIATION
The common theme of the topics covered in this unit is fields, the energy contained in these fields and the transfer of this energy. This theme is addressed in the specific topics of classical mechanics, electromagnetism and radiation physics. The classical mechanics and electromagnetism components build on material presented in introductory units and apply this to complex real world problems. The unit is designed to prepare students for more advanced studies in these areas but the unit will also provide a useful background for students undertaking a comajor in Physics or preparing for a career in secondary education.
Prerequisites: PQB250 or PCB250, and MAB311    Equivalents: PCB362    Credit points: 12    Contact hours: 4 per week    Campus: Gardens Point    Teaching period: 2010 SEM-2

PQB451 ELECTRONICS AND INSTRUMENTATION
Instrumentation plays an increasingly important role in the life of a scientist. This unit is designed to give the student a working knowledge in instrumentations and the principles of circuit theory and electronics that underlie instrumentation. It is offered at this stage of the program since it relies on work developed in the earlier advanced-level units and provides a basis for experimental work in later units.
Prerequisites: PQB250 or PCB250    Credit points: 12    Contact hours: 4 per week    Campus: Gardens Point    Teaching period: 2010 SEM-2

PQB502 ADVANCED PHYSICAL CHEMISTRY
A Chemistry graduate in today's highly technological world requires knowledge of the principles that govern the behaviour of solids, liquids, gases, and mixtures thereof. This leads to an appreciation of how fundamental physical chemical principles determine the bulk properties of materials and how the chemical nature of interfaces govern chemical reactions in many important applications. This unit is placed appropriately in fifth semester, following the second year units that provide the basic principles, language and tools of chemistry.
Credit points: 12    Contact hours: 4 per week    Campus: Gardens Point    Teaching period: 2010 SEM-1

PQB513 INSTRUMENTAL ANALYSIS
TBA
Prerequisites: PQB312 or PCB414    Equivalents: PCB514    Credit points: 12    Contact hours: 4 per week    Campus: Gardens Point    Teaching period: 2010 SEM-1

PQB531 ORGANIC MECHANISMS AND SYNTHESIS
This unit deals with organic reaction mechanisms and their application in organic synthesis. Topics in mechanisms include: structural and electronic effects that govern reactivity of organic molecules; major classes of mechanisms including elimination reactions, nucleophilic additions to carbonyl compounds, nucleophilic acyl substitution, electrophilic addition to alkenes and electrophilic substitution of aromatics. Topics in synthesis include the principles of organic synthesis design using the retrosynthetic approach; carbon-carbon bond formation to build the major functional group classes; and the use of protecting and activating groups.
Prerequisites: PQB401, PCB442    Antirequisites: PCB554    Contact hours: 12    Credit points: 12    Campus: Gardens Point    Teaching period: 2010 SEM-1

PQB550 QUANTUM AND CONDENSED MATTER PHYSICS
TBA
Prerequisites: PQB350 and (MAB135 or MAB311)    Equivalents: PCB561    Contact hours: 12    Credit points: 12    Campus: Gardens Point    Teaching period: 2010 SEM-1
emergence of life in all its complexity, culminating in trace metal speciation in environmental and biological chemistry from a range of evolving areas of relevance in systems. It includes the important issue of the societal and ethical implications of the profession of chemistry. Prerequisites: 4 Advanced Level Chemistry units Assumed knowledge: Completion of any advanced Chemistry units is assumed knowledge Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-2

PQB650 ADVANCED THEORETICAL PHYSICS
This unit consists of three parts. Part A extends the content of previous units in electromagnetism and the application of Maxwell's equations, electromagnetic waves, polarisation, dielectric permittivity, transmission line theory, waveguides, optic fibre theory, antennae. Part B includes a detailed study of magnetic resonance and its applications. Part C presents the extension of studies in statistical mechanics, including microscopic approach to entropy, partition function, paramagnetism, perfect and real classical and quantum gases, phase equilibria, Bose-Einstein condensate, Brownian motion. Prerequisites: (PQB350 or PCB462) and (PQB550 or PCB561) Equivalents: PCB665 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-2

PQB651 EXPERIMENTAL PHYSICS
This unit represents the culmination of the students experiences in undergraduate experimental work. The unit is offered in the final year of study to take advantage of and integrate the skills acquired in previous units. The student is given the opportunity to select three experiments to be undertaken from a series of extended experiments in the areas of physics research undertaken at QUT. Prerequisites: (PQB451 or PCB462) and (PQB550 or MAB112 or MAB122) Equivalents: (PQB350 or PCB462) and (PQB550 or PCB561) Antirequisites: PCB665 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point and 2010 SEM-2

PQB684 FORENSIC PHYSICAL EVIDENCE
This unit provides a theoretical and practical framework to introduce you to the physical evidence processing techniques of questioned documents and computer forensics and the forensic examination techniques of optical and electron microscopy. The unit will also discuss the physical and chemical structure of some common types of physical evidence (fibres, fabrics & severance, soils and physical fits) and the analytical methods used for their analysis. It is placed appropriately in the fifth semester of the course to coincide with and complement the Instrumental Analysis unit PQB513 which the core knowledge for the instrumental techniques used within the forensic analysis of various types of physical evidence. Prerequisites: PQB312, SCB384 Antirequisites: PQB584 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-1

PQB684 FORENSIC ANALYSIS
This unit provides a theoretical and practical framework for forensic analysis and toxicology. It includes topics such as nature and abuse of drugs; introduction to pharmacology and toxicology; illicit drugs and trace evidence; the application of GC, MS and IR in forensic examination; examination of trace evidence. Substantial laboratory and workshop sessions complement the theory. Prerequisites: PQB513 or PCB514 Equivalents: PCB684 Credit points: 12 Contact hours: 5 per week Campus: Gardens Point Teaching period: 2010 SEM-2

SCB110 SCIENCE CONCEPTS AND GLOBAL SYSTEMS
You will undertake interdisciplinary study of the physical, geological and biological concepts relating to the origins of life; from the creation of matter and planets, to the emergence of life in all its complexity, culminating in
evolution of earth ecosystems. Human influences, overlaid
upon earth's complex systems, will be examined as to their
type, extent, and impact. In counterpoint, you will explore
the breadth of philosophical
developments underlying our search for knowledge;
fundamental thoughts and ideas that span the last 2,500
years of human history. Ultimately, these concepts evolved
through the development of a scientific method and we
explore its workings in relation to the ongoing enterprise of
human understanding.

Credit points: 12  Contact hours: 4.5 per week
Campus: Gardens Point  Teaching period: 2010 SEM-1

SCB111 CHEMISTRY 1
This unit covers the fundamentals of general and physical
chemistry. Topics include atomic and molecular structure,
introduction to chemical bonding, reaction stoichiometry,
thermochemistry, gas phase chemistry, reaction kinetics,
equilibrium, acids, bases, buffers, oxidation, reduction and
electrochemistry. The practical program involves experiments illustrating a range of chemical reaction types including precipitation reactions, acid-base chemistry and redox chemistry using analytical experimental methods. A comprehensive tutorial program (CHELP) complements the lectures and is designed to assist students to develop the problem solving skills required for further study in chemistry and related sciences.
Antirequisites: SCB113  Credit points: 12  Contact hours: 4.5 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1 and 2010 SEM-2

SCB112 CELLULAR BASIS OF LIFE
A study of life processes in all five groups of living
organisms (bacteria, protists, fungi, plants and animals). Traditional topics in biology are integrated with recent research advances in molecular and cellular biology to provide a comprehensive foundation for later units in the medical, biotechnological and ecological sciences. The unit begins by constructing cells from the four quantitatively important groups of biological molecules (proteins, lipids, carbohydrates and nucleic acids). Molecular and evolutionary aspects of genetics are then introduced, with the great diversity of reproductive strategies found among organisms being emphasised. Finally, bioenergetics (photosynthesis and respiration) and its relevance to environmental issues is outlined.
Antirequisites: LSB118  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1 and 2010 SEM-2

SCB120 PLANT AND ANIMAL PHYSIOLOGY
Regardless of which area of biology you decide to
specialise in, you will need to understand the complex
interactions between cells, tissues, organs and organ
systems that comprise multi-cellular organisms. Although
many living processes can be explained at the levels of
biochemistry, biophysics and cell biology, a true
understanding of complex, multicellular organisms requires
integration of knowledge drawn from all of these areas,
combined with the more complex physiological and
structural levels you will learn about in this unit. The
knowledge gained in this and other first level units provides
you with the conceptual framework necessary to understand processes occurring from the cellular to the whole organism level and to higher levels of organisation.

Prerequisites: SCB112  Equivalents: LSB270  Credit points: 12  Contact hours: 4.5 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1 and 2010 SEM-2

SCB122 CELL AND MOLECULAR BIOLOGY
SCB122 Cell and Molecular Biology 1 equips students with
a comprehensive understanding of the molecular basis of
the cell. This unit expands on the basic principles and concepts
relating to cell structure, function, perpetuation and
specialisation introduced in SCB112 and introduces
students to fundamental molecular mechanisms central to
the organisation of the cell. Students will be shown how
macromolecular interactions are crucial to information flow
and heredity. Students are taught the relationships between
chromosomes, genes and cellular function and ultimately
how these may determine an organism's phenotype. This
unit underpins cell biology and molecular biology units that
are offered in second year Life Science units. SCB122 is
also ideal for interfaculty students (eg Education, Business,
Arts) who will undertake no further life science studies.

Prerequisites: SCB112  Antirequisites: LSB238  Credit points: 12  Contact hours: 4.5 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

SCB123 PHYSICAL SCIENCE APPLICATIONS
Physics principles underpin all of the sciences and 'new technologies'. This unit adopts an investigative team-based approach to provide students with an appreciation of fundamental concepts in physical science, together with experience in the application of these concepts to a range of 'real world' problems. The unit should be taken in the first year of study as the fundamental principles introduced here will be built upon in later units in the context of each science student's major discipline area. Employers in cutting-edge industries expect science graduates to have effective strategies for problem solving, skills for collaborative work and scientific communication and research skills. This unit aims to develop these skills by applying the fundamental concepts of physical science to problems in a team environment.

**Credit points:** 12  **Contact hours:** 4.5 per week  
**Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

### SCB131 EXPERIMENTAL CHEMISTRY

A study of chemistry and related disciplines such as medical science, biochemistry, molecular biology and pharmacy requires the development of practical laboratory skills used in synthesis and chemical analysis. This unit is a laboratory-based unit which is designed for students who intend to continue with experimental science units. The lectures complement the weekly practical sessions and teach the theory required to interpret experimental results.

**Prerequisites:** SCB111 or SCB113  
**Corequisites:** SCB121 unless SCB113 has been successfully completed

**Credit points:** 12  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

### SCB222 EXPLORATION OF THE UNIVERSE

This unit provides an introduction to optical observational astronomy; instrumentation; celestial sphere and astronomical coordinates; observations of constellations, stars, planets, clusters and other interesting celestial objects. The theory includes: optics of telescopes; properties of light; determination of physical properties of stars; nebulae; stellar spectra and classification; historical models of the solar system; Kepler's law, gravitation; physical geology of the planets and formation of the solar system; phenomena of astronomical origin; brief introduction to stars and galaxies. This course includes practical exercises and field trips.

**Credit points:** 12  **Contact hours:** 5 per week  
**Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

### SCB384 FORENSIC SCIENCES - FROM CRIME SCENE TO COURT

This unit provides an introduction to two fundamental areas in forensic science, crime scenes and justice. Mock crime scenes involving real life scenarios are used to provide hands-on training on crime scene management and examination protocols. The principles for forensic examination of crime scenes involving fire, explosion, murder, etc, are introduced through lectures, workshops and practical exercises. Also an overview of the techniques used in forensic photography, fingerprinting as well as Legal procedures at court is presented. This unit is provided by professional forensic practitioners with practical real life experience being transferred to new generations. This head start provides a unique advantage for a strong career in forensics.

**Credit points:** 12  **Contact hours:** 4.5 per week  
**Campus:** Gardens Point  **Teaching period:** 2010 SEM-1