Bachelor of Technology Innovation (Biotechnology) (ST50)

Year offered: 2010
Admissions: Yes
CRICOS code: 070694G
Course duration (full-time): 4 years
Domestic fees (indicative): 2010: CSP $2,125 (indicative)
per semester
International Fees (indicative): 2010: $11,750 (indicative)
per semester
Domestic Entry: February
International Entry: February and July
Past rank cut-off: 77
Past OP cut-off: 12
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: 384
Standard credit points per full-time semester: 96
Course coordinator: Associate Professor Chris Collet
Campus: Gardens Point

Overview

Biotechnology is the application of cell and molecular biology and biochemical principles to create a new generation or products and processes for the benefit of society.

Career Outcomes

Graduates can build careers in the world of commercialisation and technology transfer of research innovation and complex emerging technologies pertaining to their specific discipline and beyond. Graduates could pursue careers in all aspects of the new product development continuum including business development officers, venture capital associates, investment analysts, commercialisation managers, technology transfer officers, intellectual property analysts, policy development officers and, of course, research scientists.

Professional Recognition

Graduates are eligible for membership of AusBiotech Ltd, Australian Society for Biochemistry and Molecular Biology (ASBMB) and, depending on unit selection, Australian Society for Medical Research (ASMR) and the Australian Society for Microbiology (ASM).

Biotechnology Major Course Structure

Year 1 Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCB110</td>
<td>Science Concepts and Global Systems</td>
</tr>
</tbody>
</table>

Year 1 Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>SCB111</td>
<td>Chemistry 1</td>
</tr>
<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>
</tr>
<tr>
<td>MAB120</td>
<td>Algebra and Calculus</td>
</tr>
<tr>
<td>MAB121</td>
<td>Calculus and Differential Equations</td>
</tr>
</tbody>
</table>

NOTE: Students with a Sound Achievement in Maths B and NOT wishing to major in Mathematics or Physics should enrol in MAB101

Students without a Sound Achievement (4 semesters) in Maths B should enrol in MAB105

Students with a Sound Achievement in Maths C and wishing to major in Mathematics or Physics should enrol in MAB121

Students without a Sound Achievement in Maths C and wishing to major in Mathematics or Physics should enrol in MAB120

Year 2 Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>LQB381</td>
<td>Biochemistry: Structure and Function</td>
</tr>
<tr>
<td>LQB383</td>
<td>Molecular and Cellular Regulation</td>
</tr>
<tr>
<td>LQB386</td>
<td>Microbial Structure and Function</td>
</tr>
<tr>
<td>LQB388</td>
<td>Medical Physiology 1</td>
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</tbody>
</table>

Plus TWO units from the relevant options List which may include one unit from outside the Faculty

Relevant Options List for Year 2, Semester 1

Year 2 Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>LQB483</td>
<td>Molecular Biology Techniques</td>
</tr>
<tr>
<td>LQB484</td>
<td>Introduction to Genomics and Bioinformatics</td>
</tr>
<tr>
<td>LQB481</td>
<td>Biochemical Pathways and Metabolism</td>
</tr>
<tr>
<td>LQB486</td>
<td>Clinical Microbiology 1</td>
</tr>
<tr>
<td>LQB488</td>
<td>Medical Physiology 2</td>
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</tbody>
</table>

Plus TWO units from the relevant options List which may include one unit from outside the Faculty

Relevant Options List for Year 2, Semester 2
UNIT SYNOPSES

AMB240 MARKETING PLANNING AND MANAGEMENT
This unit extends the student’s knowledge of the fundamental marketing concepts and theories introduced in the Faculty Core unit in Marketing, by adding further breadth and depth of knowledge of marketing and developing skills in the application of this knowledge to marketing planning and management within the business environment. Emphasis is on the role of the marketing manager at the product management level in undertaking analysis, planning, implementation and control of marketing activities.

Prerequisites: BSB126 or CTB126
Credit points: 12
Contact hours: 3 per week
Campus: Gardens Point and Caboolture
Teaching period: 2010 SEM-1 and 2010 SEM-2

BSB115 MANAGEMENT
The unit provides an introduction to the theories and practice of management and organisations. Emphasis is on the conceptual and people skills that are needed in all areas of management and in all areas of organisational life. The unit acknowledges that organisations exist in an increasingly international environment where the emphasis will be on knowledge, the ability to learn, to change and to innovate. Organisations are viewed from individual, group, corporate and external environmental perspectives.

Antirequisites: BSD115
Equivalents: CTB115
Credit points: 12
Contact hours: 3 per week
Campus: Gardens Point and Caboolture
Teaching period: 2010 SEM-1, 2010 SEM-2 and 2010 SUM

BSB126 MARKETING
This introductory subject examines the role and importance of marketing to the contemporary organisation. Emphasis is placed on understanding the basic principles and practices of marketing such as the marketing concept, market segmentation, management information systems and consumer behaviour. The unit explores the various elements of the marketing mix, with special reference to product, price, distribution, and promotion, including advertising and public relations. By way of introduction only, key issues relating to services marketing, e-marketing and strategic marketing are also canvassed.

Antirequisites: BSB116
Equivalents: CTB126
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point and Caboolture
Teaching period: 2010 SEM-1, 2010 SEM-2 and 2010 SUM

BSB311 INNOVATION COMMERCIALISATION STRATEGIES
Students study strategies and approaches used in industry and government organisations for the research, development and commercialisation of biotechnology innovations. The unit offers the opportunity to read widely as well as in depth about the commercialisation of molecular biology and biotechnology research. Theoretical concepts are integrated with prepared case studies prior to guest speaker seminars.

Prerequisites: BSB310 or MGB223
Credit points: 12
Contact hours: 3 per week
Campus: Gardens Point
Teaching period: 2010 SEM-2

LQB381 BIOCHEMISTRY: STRUCTURE AND FUNCTION
This unit extends basic organic chemistry theory to the level of the biological macromolecules. A clear understanding of...
the structure and function of these molecules is essential to a student’s understanding of the metabolism of living cells. Hence this biomolecular unit is a fundamental prerequisite for all advanced units in the various disciplines in the field of life sciences.

**Prerequisites:** (SCB121 and SCB122) or (SCB111 and SCB121) or SCB113  
**Antirequisites:** LSB275 and LSB325 and LSB308  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**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:** SCB122 or LSB238  
**Antirequisites:** LSB486 and LSB338  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**LQB386 MICROBIAL STRUCTURE AND FUNCTION**

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 micro-organisms 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.

**Prerequisites:** SCB112 and (SCB121 or SCB113)  
**Antirequisites:** LSB328  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**LQB388 MEDICAL PHYSIOLOGY 1**

This unit deals specifically with the physiological systems that are responsible for the maintenance of health in humans. In the course of the semester students will investigate half the systems that constitute the human body (with the remainder dealt with in the second semester unit Physiology 2 [LQB488]). The unit offers a useful frame of reference for students enrolled in courses such as animal biology, biochemistry, microbiology, molecular biology, nutrition and human movements. Together with Physiology 2 [LQB488] this unit is a prerequisite to the third level unit, Applied Physiology [LQB588] and will be of particular interest to students considering medicine as a postgraduate career option.

**Prerequisites:** SCB120, LSB131, LSB142, LSB255, LSB258 or NRB270  
**Antirequisites:** LSB358  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**LQB481 BIOCHEMICAL PATHWAYS AND METABOLISM**

The study of biochemistry and cell biology, along with molecular biology, provides students with the knowledge required for the proper understanding of the structure and function of living organisms at the molecular level. As such, this unit extends the studies begun in the unit LQB381 Biochemistry into the metabolic processes occurring in living cells, and provides students with a basis for further studies in biochemistry as well as support for other units in the third year of the course.

**Prerequisites:** LQB381 or LSB308  
**Antirequisites:** LSB275, LSB325, LSB408  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**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:** LSB238 or SCB122  
**Antirequisites:** LSB468, LSN468, LSN483  
**Assumed knowledge:** LSB383 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 a 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:** LQB383 or LSB338 or LSN101 and LSN102

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

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**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:** LSB435, LSB547  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

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**LQB488 MEDICAL PHYSIOLOGY 2**

This unit deals specifically with the physiological systems that are responsible for the maintenance of health in humans. In the course of the semester students will investigate half the systems that constitute the human body (with the remainder having been dealt with in the first semester unit Physiology 1 [LQB388]). The unit offers a useful frame of reference for students enrolled in courses such as animal biology, biochemistry, microbiology, molecular biology, nutrition and human movements. Together with Physiology 1 [LQB388] this unit is a prerequisite to the third level units, Applied Physiology [LQB588] and will be of particular interest to students considering medicine as a postgraduate career option.

**Prerequisites:** LSB131, LSB142, LSB255, LSB258, NRB270, or SCB120  
**Antirequisites:** LSB458, LSB469  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

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**LQB489 PLANT PHYSIOLOGY AND CELL BIOLOGY**

Plants are a vital resource providing food, medicines, fibre and fuel. The utilisation and manipulation of plants requires an understanding of growth and development on a molecular, cellular and whole plant basis. This is an intermediate-level unit covering the principles of plant cell biology and physiology to provide a platform for more advanced studies in plant biology and biotechnology. It integrates the fundamentals of plant physiology, biochemistry and molecular biology in such a way to enable students to understand how plants grow, develop and interact with their environment, and will also be valuable for lifelong appreciation of the potential of agriculture and its contribution to humanity. The aim of this unit is to provide you with an understanding of plant function from the cell to the whole plant, skills in measuring and monitoring these processes and an appreciation of how they are influenced by the environment.

**Prerequisites:** SCB120 or SCB122 or NRB270 or LSB238  
**Antirequisites:** LSB397, LSB497  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

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**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  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

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**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

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**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

**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

**LQB684 MEDICAL BIOTECHNOLOGY**

In this unit students gain a thorough understanding of diagnostics and therapeutics in the commercial environment of biotechnology. LQB6849 aims to increase the student’s understanding of cell-based strategies, approaches and applications used as therapeutic interventions in medicine. The unit focuses on current, state-of-the-art and emerging technologies and applications within biotechnology as directed to novel therapeutic discovery, design, development and delivery of clinical therapeutics including tissue transplantation and regeneration, cellular therapies, genetic therapies, immunotherapies, clinical, ethical and regulatory affairs.

**Prerequisites:** LQB584 or LSB503 or LSB449  **Antirequisites:** LSN684  **Assumed knowledge:** A background understanding of Cell and Molecular Biology as provided in LQB383, LQB483 and LQB584 is assumed knowledge  **Equivalents:** LSB609  **Credit points:** 12  **Contact hours:** 5 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

**LQB685 PLANT MICROBE INTERACTIONS**

Microorganisms, including viruses, bacteria and fungi, cause many devastating diseases in plants and are responsible for significant losses to crops in Australia and Internationally. Diagnosis and control of these organisms, which vary considerably in their biology and infection strategies, is an ongoing challenge. However, plant genetic engineering approaches are now offering new and novel solutions to these problems. These approaches are of widespread scientific, commercial and humanitarian interest. The application of current technologies and development of new, novel technologies relies on an understanding of the biology of the organism, of the way in which these organisms cause disease in plants and the mechanism by which many plants are resistant.

**Prerequisites:** LQB483 or LSN483 and LSN101 and LSN102  **Antirequisites:** LSB578  **Assumed knowledge:** LQB386 recommended  **Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

**LWS007 INTRODUCTION TO INTELLECTUAL PROPERTY LAW**

Intellectual property protection is undoubtedly of paramount importance in the research, development and commercialisation of emerging technologies. Managers and researchers need to be aware of the different types of property that can be protected and how the property needs to be protected. There have also been significant developments in the field of intellectual property law in recent years. The concepts taught in Introduction to Intellectual Property Law are of significant relevance to persons intending to practice in the emerging fields of science.

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

**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 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, 2010 SEM-2 and 2010 SUM

**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

**MGB223 ENTREPRENEURSHIP AND INNOVATION**  
This unit introduces students to the nature and characteristics of entrepreneurship and innovation and explores the inter-relationship between the two within contemporary economies from managerial perspective. Learning will be directed towards developing the theoretical and applied knowledge, skills, and attitudes that will support and enhance innovation and enterprise creation activity, through the development of a business plan. The unit is designed for those individuals interested in creating a new venture or working in industries as employees of venture owners or those that serve this sector. Students will have opportunity to build a comprehensive plan of their business concept.

**Prerequisites:** BSB115 or CTB115  
**Equivalents:** CTB223  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point and Caboolture  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**MGB225 INTERCULTURAL COMMUNICATION AND NEGOTIATION SKILLS**  
The course develops students' abilities to identify and resolve problems in cross-cultural communication or negotiation situations where cultural differences have created misunderstandings or undesirable or unexpected outcomes. It first explores the concept of 'national culture' by considering the work of major theorists of cultural value dimensions - from Hall to Schwartz. Students are encouraged to analyse communication/negotiation process issues in terms of these value dimensions and to practise managing the process of communication/negotiation to improve their outcomes.

**Prerequisites:** BSB115, CTB115, BSB119 or BSB124  
**Antirequisites:** MGB312  
**Equivalents:** IBB205  
**Credit points:** 12  
**Contact hours:** 3  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**MGB324 MANAGING BUSINESS GROWTH**  
This unit is designed to provide skills in the analysis, solutions and implementation of the general management issues that SME owners have to manage in their growing operations. The unit brings together the different functional aspects of managing an established SME and how they are best managed from the owner's (general manager's) point of view. It also provides opportunity to bring students into contact with real world SME owners and their venture management issues.

**Prerequisites:** MGB223  
**Equivalents:** MGB218  
**Credit points:** 12  
**Contact hours:** 3  
**Teaching period:** 2010 SEM-1

**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 counterpart, 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, thermochromy, 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:** NRB270  
**Credit points:** 12  
**Contact hours:** 4.5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**SCB121 CHEMISTRY 2**

Chemistry is the central science. This is a unit of fundamental importance as it covers the background and general principles that underpin understanding in many Science and Health related disciplines, particularly in regards to the chemistry of life. In this unit students will be introduced to fundamental aspects of chemistry including the electronic structure of atoms, chemical bonding and molecular structure. From this basis students will develop an understanding of the fundamentals of organic chemistry including chirality, functional groups and organic reactions which will lead to important bio-inorganic molecules and coordination complexes.

**Prerequisites:** (SCB111 or PCB142)  
**SCB111 can be studied in the same teaching period**  
**Antirequisites:** SCB113  
**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 related 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

**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