Bachelor of Technology Innovation (Microbiology) (ST50)

Year offered: 2011
Admissions: Yes
CRICOS code: 070694G
Course duration (full-time): 4 years
Domestic Fees (indicative): 2011: CSP $2,178 (indicative)
per semester
International Fees (indicative): 2011: $12,250 (indicative)
per semester
Domestic Entry: February
International Entry: February and July
QTAC code: 418311
Past rank cut-off: 76
Past OP cut-off: 12
OP Guarantee: Yes
Assumed knowledge: English (4,SA), Maths B (4,SA), Chemistry (4,SA)
Preparatory studies: For information on acquiring assumed knowledge visit http://www.qut.edu.au/assumed-knowledge
Total credit points: 384
Standard credit points per full-time semester: 96
Course coordinator: Associate Professor Chris Collet
Campus: Gardens Point

Professional Recognition
Graduates are eligible for membership of the Australian Society for Microbiology (ASM).

Your Course

Year 1
You will be able to choose subjects from across a range of science and technology areas to help you define your choice of disciplinary major. The introductory core studies will provide you with a solid foundation in your chosen disciplinary skills and build the basis for future studies.

Year 2
You will be introduced to advanced theoretical concepts and practical skills that serve to build your expertise in the science and technology disciplines. A thorough understanding of science and technology theory and practice is necessary to understand, evaluate and communicate aspects of innovation to the business world.

Year 3
In third year, you will complete your science and technology disciplinary advanced studies and take basic and advanced business units that encompass the business of innovation, intellectual property law and professional skills development. Through the action learning framework of the Student Enterprise Scheme, professional skills development will concentrate on communication and team-building skills.

These exercises will help prepare you for industry-based consultancy style projects and extra-curricular networking events and an industry career.

Year 4
You will undertake integrative business units that develop the entrepreneurial mindset needed for a career in innovation commercialisation. You will further develop your professional skills through networking events. Student teams will source an industry-based consultancy-style project that will serve to provide real world experience and ready you for your future career.

Microbiology Major Course Structure

Year 1 Semester 1
SCB110 Science Concepts and Global Systems
SCB111 Chemistry 1
SCB112 Cellular Basis of Life
Plus TWO units from the relevant options List

Year 2 Semester 1
SCB120 Plant and Animal Physiology
SCB121 Chemistry 2
SCB122 Cell and Molecular Biology
SCB123 Physical Science Applications

Year 1 Semester 2
SCB110 Science Concepts and Global Systems
SCB111 Chemistry 1
SCB112 Cellular Basis of Life
Plus ONE from the following four units:
MAB101 Statistical Data Analysis 1
MAB105 Preparatory Mathematics
MAB120 Algebra and Calculus
MAB121 Calculus and Differential Equations
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
LQB381 Biochemistry: Structure and Function
LQB386 Microbial Structure and Function
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:
- LQB383 Molecular and Cellular Regulation
- LQB388 Medical Physiology 1
- Elective

### Year 2 Semester 2
- LQB483 Molecular Biology Techniques
- LQB486 Clinical Microbiology 1
  - 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:
  - LQB481 Biochemical Pathways and Metabolism
  - LQB484 Introduction to Genomics and Bioinformatics
  - LQB488 Medical Physiology 2
  - LQB489 Plant Physiology and Cell Biology
  - Elective

### Year 3 Semester 1
- BSB115 Management
- LQB586 Clinical Microbiology 2
- LQB587 Applied Microbiology 1: Water, Air and Soil
- STB551 Engaging with the Innovation Industry

### Year 3 Semester 2
- BSB126 Marketing
- MGB223 Entrepreneurship and Innovation
- LQB686 Microbial Technology and Immunology
- LQB687 Applied Microbiology 2: Food and Quality Assurance

### Year 4 Semester 1
- AMB240 Marketing Planning and Management
- LWS007 Introduction To Intellectual Property Law
- MGB324 Managing Business Growth
- STB709-1 Innovation and Commercialisation Project

### Year 4 Semester 2
- BSB311 Innovation Commercialisation Strategies
- MGB225 Intercultural Communication and Negotiation Skills
- STB709-2 Innovation and Commercialisation Project
- STB709-3 Innovation and Commercialisation Project

### 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  
**Equivalents**: AMX240, CTB240  
**Credit points**: 12  
**Contact hours**: 3 per week  
**Campus**: Gardens Point and Caboolture  
**Teaching period**: 2011 SEM-1 and 2011 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**: BSX115, CTB115  
**Credit points**: 12  
**Contact hours**: 3 per week  
**Campus**: Gardens Point and Caboolture  
**Teaching period**: 2011 SEM-1, 2011 SEM-2 and 2011 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, BSD126  
**Equivalents**: BSX126, CTB126  
**Credit points**: 12  
**Contact hours**: 4 per week  
**Campus**: Gardens Point and Caboolture  
**Teaching period**: 2011 SEM-1, 2011 SEM-2 and 2011 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: MGB223 or LSP127  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2011 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: 2011 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: LSB468 and LSB338  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 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 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.
Prerequisites: SCB112 and (SCB121 or SCB113)  Antirequisites: LSB328  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 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: LSB111 or LSB131 or LSB142 or LSB255 or LSB258 or SCB120  Antirequisites: LSB358  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 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  Corequisites: PUB405  Antirequisites: LSB275, LSB325, LSB408  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 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:** 2011 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 (i.e., 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:** 2011 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:** LSB435, LSB547  **Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2011 SEM-2

**LQB488 MEDICAL PHYSIOLOGY 2**
An appreciation of how the human body works is an essential prerequisite to understanding the basis of health, disease, diagnostic technologies and treatment strategies. This unit deals specifically with the physiological systems that are responsible for the maintenance of health in humans. It therefore provides a useful frame of reference for students enrolled in biomedical science, pharmacy, human movement studies, nutrition and dietetics or any of the life science majors. The aim of this unit is to introduce you to the normal physiology of the human body in order to facilitate an understanding of how injury or disease affect health as well as the mechanism of action of drugs and other therapeutic interventions.

**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:** 2011 SEM-2

**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:** 2011 SEM-2

**LQB586 CLINICAL MICROBIOLOGY 2**
Clinical microbiology laboratories throughout the world are recognising the need to maximise their diagnostic capabilities for accurate and early detection and management of medically-important parasitic, fungal and bacterial diseases of humans. This unit emphasises a strong commitment to professional practice by: (i) providing you with a comprehensive, in-depth knowledge and understanding of infectious disease states and their etiology, (ii) developing high level generic and specific laboratory-based skills in diagnostic microbiology and (iii) developing and refining critical thinking skills so that experimental results may be observed and recorded intelligently and reported with a high degree of confidence in their validity and rigor.

**Prerequisites:** LQB486  **Antirequisites:** LSB547 and LSB647  **Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2011 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
Antirequisites: LSB528 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2011 SEM-1

LQB686 MICROBIAL TECHNOLOGY AND IMMUNOLOGY
This capstone unit builds upon your foundation knowledge and understanding of microorganisms and bioinformatics, molecular technology, and immunological skills. You will: (i) study infectious disease states as a major focus, (ii) research the importance of microbial pathogens as aetiological agents of disease, (iii) apply your knowledge of bioinformatics and molecular assays to design polymerase chain reaction (PCR) assays that can be used to selectively detect and amplify a specific bacterial pathogen, (iii) extend your knowledge of molecular subtyping methods, genomics, manipulation of bacterial genes, antibiotics, human immunology and vaccines, and (iv) write a research report in the format of a journal article.

Prerequisites: LQB386 and LQB483 Antirequisites: LSB648 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2011 SEM-2

LQB687 APPLIED MICROBIOLOGY 2: FOOD AND QUALITY ASSURANCE
Food microbiology and quality assurance constitute potential areas of employment for graduates. Many aspects of these disciplines are important in public health and operational management. Understanding fundamental concepts and their correct application are critical for food safety and management of both food- and non-food-based operations. This unit with content in applied food microbiology and quality systems, builds on the introduction to food microbiology provided in earlier units. The aim of this unit is to gain advanced knowledge and expertise in food microbiology and fundamental quality assurance principles suitable for application in food and other (bio)technology-based industries.

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: 2011 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: 2011 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, MAB233 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: 2011 SUM-2, 2011 SEM-1 and 2011 SEM-2

MAB105 PREPARATORY MATHEMATICS
This unit is intended to cater for the needs of students whose background in mathematics is either weak or does not reach the equivalent of Senior Mathematics B. It is intended to provide the concepts and skills needed for a successful study of those units within the university which assume a background equivalent to Senior Mathematics B. This unit is incompatible with a grade of High Achievement in Senior Mathematics B. The aim of this unit is to develop your mathematical skills in and understanding of algebra, functions and graphing, differential and integral calculus of one variable and to interpret and solve simple, real world problems using these skills.

Assumed knowledge: Year 10 Level 6 Mathematics is assumed knowledge

Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2011 SEM-1 and 2011 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.

Antirequisites: MAN120 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: 2011 SEM-1, 2011 SEM-2 and 2011 SUM

MAB121 CALCULUS AND DIFFERENTIAL EQUATIONS
Building upon the foundations established in MAB120 or Senior Maths C, this unit addresses the significant role of mathematical modelling using differential equations for the description and resolution of simple and complex problems relevant to real world situations. The formulation and solution of such problems is supported by appropriate advanced mathematical concepts used for function approximation, differentiation and integration. Undertaking this unit will allow you to develop your problem solving skills, especially in the context of advanced mathematical techniques applied to ordinary differential equations used to model real world problems. You will also gain a deeper understanding of the concepts of the derivative and the integral, and how these may be used in applied contexts.

Antirequisites: MAN121 Assumed knowledge: Grade of at least Sound Achievement in Senior Mathematics C (or equivalent) or MAB120 or MAB100 or MAB125

Equivalents: MAB111, MAB126, MAB131, MAB182
Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2011 SEM-1, 2011 SEM-2 and 2011 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, MGX223 Credit points: 12 Contact hours: 3 per week Campus: Gardens Point and Caboolture Teaching period: 2011 SEM-1 and 2011 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, MGX225
Credit points: 12 Contact hours: 3 Campus: Gardens Point and Caboolture Teaching period: 2011 SEM-1 and 2011 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, MGX324
Credit points: 12 Contact hours: 3 Campus: Gardens Point and Caboolture Teaching period: 2011 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 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.
SCB111 CHEMISTRY 1
Chemistry is the central science. It affects society as well as the individual. It is the language and principal tool of the physical sciences, the biological sciences, the health sciences and the agricultural and earth sciences. A basic knowledge of chemistry is essential to all students in these areas. Knowledge of chemistry allows a better understanding of the human body and of the environment in which we live. The aim of this unit is to introduce you to the basic concepts of general, inorganic, analytical and physical chemistry.

Antirequisites: SCB113  Credit points: 12  Contact hours: 4.5 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1

SCB112 CELLULAR BASIS OF LIFE
Scientists from all disciplines need an appreciation and a broad overview of the characteristics and functioning of the five groups of living organisms (bacteria, protists, fungi, plants and animals), and their interactions with the inanimate world. SCB112 Cellular Basis of Life is a first semester unit that is essential for many students undertaking courses requiring biological knowledge. Through integrated lecture and laboratory classes, this unit provides you with a foundation for later more advanced studies in your course or major (eg such as medical science, biomedical science, pharmacy, optometry, biochemistry, biotechnology, microbiology, geosciences, ecology, business and education among others). The aim of this unit is to introduce you to the wide diversity of living organisms while emphasising the unity of life processes at the cellular, biochemical and biological levels.

Antirequisites: LQB182, LSB118  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1 and 2011 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: 2011 SEM-1 and 2011 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. In this unit you will be introduced to fundamental aspects of chemistry including the nature of matter, atoms, molecules and ions. From this basis you will develop an understanding of the electronic structure of atoms, chemical bonding and molecular structure as well as the fundamentals of organic chemistry (often described as the chemistry of life). The aims of this unit are to generate an understanding of the importance of chemical bonding and molecular structure and how these factors affect the properties of organic and bioinorganic molecules; and to allow recognition of, and provide an understanding of, the nature of organic functional groups and their respective reactivity.

Prerequisites: (SCB111 or PCB142) . SCB111 can be studied in the same teaching period  Antirequisites: PQB105 and SCB113  Credit points: 12  Contact hours: 4.5 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1 and 2011 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. SCB112 can be studied in the same teaching period  Antirequisites: LSB238  Credit points: 12  Contact hours: 4.5 per week  Campus: Gardens Point  Teaching period: 2011 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:** 2011 SEM-2

**STB551 ENGAGING WITH THE INNOVATION INDUSTRY**

Working in the innovation industry requires a suite of skills beyond an in depth technical and/or business knowledge of a disciplinary area. Successful facilitators of innovation exchange require well developed professional portfolios and high level capabilities in the generic or soft skills including communication (written, oral and aural), thinking approaches (analytical, critical and lateral), adaptability, flexibility, leadership, learning approaches and team-based skills. This unit helps prepare you to become a professional in the innovation industry whether as an entrepreneur seeking funding for development of intellectual property or as facilitator of innovation exchange between inventor, venture capital sources and the global marketplace.

**Credit points:** 12  
**Teaching period:** 2011 SEM-1

**STB709 INNOVATION AND COMMERCIALISATION PROJECT**

The Innovation and Commercialisation Project is a capstone unit that provides a concrete opportunity for students to consolidate and contextualise the knowledge and skills they have acquired in the course and apply them to a substantial project. The unit serves to provide work experience and link University study with the professional practice of innovation commercialisation context. New venture areas of industry, focussed as they often are on emergent technologies and the commercialisation of innovation, require graduates capable of high levels of critical thinking and evaluation coupled with a sound technical and business knowledge and skills base of relevance to the particular innovation context. The capacity to conduct rigorous analysis into the research, development and commercialisation of products and processes is a fundamental aspect of converting real-world science and technology into products for the global marketplace.

**Prerequisites:** STB551  
**Credit points:** 12  
**Teaching period:** 2011 SEM-1, 2011 SEM-2 and 2011 SUM

**STB709 INNOVATION AND COMMERCIALISATION PROJECT**

The Innovation and Commercialisation Project is a capstone unit that provides a concrete opportunity for students to consolidate and contextualise the knowledge and skills they have acquired in the course and apply them to a substantial project. The unit serves to provide work experience and link University study with the professional practice of innovation commercialisation context. New venture areas of industry, focussed as they often are on emergent technologies and the commercialisation of innovation, require graduates capable of high levels of critical thinking and evaluation coupled with a sound technical and business knowledge and skills base of relevance to the particular innovation context. The capacity to conduct rigorous analysis into the research, development and commercialisation of products and processes is a fundamental aspect of converting real-world science and technology into products for the global marketplace.

**Prerequisites:** STB551  
**Credit points:** 12  
**Teaching period:** 2011 SEM-1, 2011 SEM-2 and 2011 SUM