Bachelor of Technology Innovation (Chemistry) (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

Why Choose This Course
If you like to work in a dynamic world of translating discovery and creativity into commercial products, meeting people, and working in a high-powered team environment to build money-making enterprises, then this course is for you. The Bachelor of Technology Innovation will allow a rapid entry into the high-flying world of commercialisation and technology transfer. This new degree builds upon the successful Bachelor of Biotechnology Innovation which has seen graduates realise outstanding job outcomes, often successfully competing against graduates with PhDs and MBAs.

Professional Recognition
On graduation, you will be eligible to join professional organisations relevant to your disciplinary specialisation, the Association of Professional Engineers, Scientists and Managers, Australia and the Australian Institute of Management.

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.

Chemistry Major Course Structure

<table>
<thead>
<tr>
<th>Year 1 Semester 1</th>
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<tbody>
<tr>
<td>SCB110 Science Concepts and Global Systems</td>
</tr>
<tr>
<td>SCB111 Chemistry 1</td>
</tr>
<tr>
<td>SCB112 Cellular Basis of Life</td>
</tr>
<tr>
<td>Plus ONE of the following units</td>
</tr>
<tr>
<td>MAB101 Statistical Data Analysis 1</td>
</tr>
<tr>
<td>MAB105 Preparatory Mathematics</td>
</tr>
<tr>
<td>MAB120 Algebra and Calculus</td>
</tr>
<tr>
<td>MAB121 Calculus and Differential Equations</td>
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</tbody>
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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 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 1 Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>SCB121</td>
<td>Chemistry 2</td>
</tr>
<tr>
<td>SCB123</td>
<td>Physical Science Applications</td>
</tr>
<tr>
<td>SCB131</td>
<td>Experimental Chemistry</td>
</tr>
<tr>
<td></td>
<td>Plus ONE of the following two units</td>
</tr>
<tr>
<td>MAB120</td>
<td>Algebra and Calculus</td>
</tr>
<tr>
<td>SCB122</td>
<td>Cell and Molecular Biology</td>
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Year 2 Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>PQB312</td>
<td>Analytical Chemistry For Scientists and Technologists</td>
</tr>
<tr>
<td>PQB331</td>
<td>Structure and Bonding</td>
</tr>
<tr>
<td></td>
<td>Plus TWO units from the relevant options List which may include one unit from outside the Faculty</td>
</tr>
<tr>
<td>MAB120</td>
<td>Algebra and Calculus</td>
</tr>
<tr>
<td>PQB313</td>
<td>Analytical Chemistry For Industry</td>
</tr>
<tr>
<td></td>
<td>Elective</td>
</tr>
<tr>
<td></td>
<td>MAB120 may be taken by students who undertook SCB122 in Year 1 Semester 2</td>
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Year 2 Semester 2

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>PQB401</td>
<td>Reaction Kinetics, Thermodynamics and Mechanisms</td>
</tr>
<tr>
<td>PQB442</td>
<td>Chemical Spectroscopy</td>
</tr>
<tr>
<td></td>
<td>Plus TWO units from the relevant options List which may include one unit from outside the Faculty</td>
</tr>
<tr>
<td>PQB404</td>
<td>Nanotechnology and Nanoscience</td>
</tr>
<tr>
<td>PQB423</td>
<td>Process Principles</td>
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<td></td>
<td>Elective</td>
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Year 3 Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BSB115</td>
<td>Management</td>
</tr>
<tr>
<td>PQB502</td>
<td>Advanced Physical Chemistry</td>
</tr>
<tr>
<td>PQB531</td>
<td>Organic Mechanisms and Synthesis</td>
</tr>
<tr>
<td>STB551</td>
<td>Engaging with the Innovation Industry</td>
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Year 3 Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BSB126</td>
<td>Marketing</td>
</tr>
<tr>
<td>MGB223</td>
<td>Entrepreneurship and Innovation</td>
</tr>
<tr>
<td>PQB631</td>
<td>Advanced Inorganic Chemistry</td>
</tr>
<tr>
<td>PQB642</td>
<td>Chemical Research</td>
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Year 4 Semester 1

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>AMB240</td>
<td>Marketing Planning and Management</td>
</tr>
<tr>
<td>LWS007</td>
<td>Introduction To Intellectual Property Law</td>
</tr>
<tr>
<td>MGB324</td>
<td>Managing Business Growth</td>
</tr>
<tr>
<td>STB709-1</td>
<td>Innovation and Commercialisation Project</td>
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Year 4 Semester 2

<table>
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<tbody>
<tr>
<td>BSB311</td>
<td>Innovation Commercialisation Strategies</td>
</tr>
<tr>
<td>MGB225</td>
<td>Intercultural Communication and Negotiation Skills</td>
</tr>
<tr>
<td>STB709-2</td>
<td>Innovation and Commercialisation Project</td>
</tr>
<tr>
<td>STB709-3</td>
<td>Innovation and Commercialisation Project</td>
</tr>
</tbody>
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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-1

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

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 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

**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 SUM

**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

**PQB312 ANALYTICAL CHEMISTRY FOR SCIENTISTS AND TECHNOLOGISTS**
This unit addresses three vital theoretical and practical elements of analytical chemistry: quality assurance in a chemical laboratory; principles of chemical sampling; common instrumental techniques. It is a generic unit designed to address the needs and skills of students enrolled in the Chemistry major as well as other majors such as Forensic Science and double degrees in with the Chemistry major. The unit builds on the analytical chemistry concepts introduced in SCB131 Experimental Chemistry. The aim of this unit is to provide students with principles of analytical chemistry, including some common instrumental techniques, which are firmly linked to the theory and practice of the discipline in a modern, working laboratory. **Prerequisites:** SCB131 **Equivalents:** PCB414 **Credit points:** 12 **Contact hours:** 4.5 per week **Campus:** Gardens Point and Caboolture **Teaching period:** 2011 SEM-1 and 2011 SEM-2

**PQB313 ANALYTICAL CHEMISTRY FOR INDUSTRY**
A modern chemist working in industry requires a thorough understanding of the fundamentals of analytical chemistry on which applications in sophisticated, state-of-the-art instrumental methods are based. This unit provides students with a grounding in the classical qualitative and quantitative gravimetric and wet analysis, together with common spectrophotometric and electrochemical methods of analysis. Through the practical program in this unit, students will be able to learn the connections between the theoretical aspects of analytical chemistry and the work in the laboratory. The chemistry behind some applications of these methods is also discussed, eg water, fertilisers, foods, minerals, metals, etc. **Prerequisites:** SCB131 **Equivalents:** PCB314 **Credit points:** 12 **Contact hours:** 4.5 per week **Campus:** Gardens Point **Teaching period:** 2011 SEM-1
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: 2011 SEM-1

PQB401 REACTION KINETICS, THERMODYNAMICS AND MECHANISMS
Physical Chemistry is a discipline of chemistry in which the influences of physical factors on chemical reactions are described and quantified. The fundamental factors that govern the extents (equilibria) and rates (kinetics) of chemical reactions are usually the realm of Physical Chemistry. This unit illustrates this basic science with applications of these principles to actual reaction types that are expounded as case studies of the principles underlying the Chemistry. In addition, all students of chemistry need an understanding of the concepts of acids and bases in their widest sense. This unit provides the tools that chemists use to understand how and why molecules react. The aim of this unit is to demonstrate how reactions and their equilibria and rates can be described and quantified, and to understand by studying key examples, the fundamental factors that govern the outcomes of chemical reactions.
Prerequisites: PQB331
Antirequisites: PCB354, PCB405
Credit points: 12
Contact hours: 4.5 per week
Campus: Gardens Point
Teaching period: 2011 SEM-2

PQB404 NANOTECHNOLOGY AND NANOSCIENCE
Nanotechnology is the science of constructing molecular-scale devices and of their applications. Like biotechnology, it is a growth industry and has the potential to significantly affect our lives and the world in which we live. Nanotechnology is truly interdisciplinary, it draws on the strengths of all the basic sciences. The lecture component of the unit will comprise an introduction to the field of Nanotechnology and Nanoscience, with a bias towards Chemical Technology applications derived from the Physical Sciences. The laboratory component will focus on the techniques currently used to characterise and manipulate nanoscale material and the construction of functional devices from nanoscale, molecular components.
Prerequisites: SCB111 and (SCB121 or SCB113)
Equivalents: PCB445
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2011 SEM-2

PQB423 PROCESS PRINCIPLES
This unit will provide students with a knowledge of qualitative and quantitative aspects of Process Principles. These include an overview of chemical reactions involving important processes and the skills to undertake mass and energy balances around a system whether that system be an individual industrial process, a combination of such processes or a natural phenomenon. This knowledge will also enable students to participate in the identification, quantification and solution of problems arising during the day to day operation of industrial processes.
Prerequisites: SCB131
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2011 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: 2011 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.
Prerequisites: PQB401
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2011 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, PQB442    Antirequisites: PCB554    Credit points: 12    Contact hours: 4 per week
Campus: Gardens Point    Teaching period: 2011 SEM-1

PQB631 ADVANCED INORGANIC CHEMISTRY
Major topics covered are as follows: organometallic chemistry, including metal-carbon bonding, main group and transition metal organometallics and applications of organometallic compounds in synthetic chemistry; bioinorganic chemistry; physical methods of structure determination, such as single crystal X-ray diffraction; chemical applications of group theory.

Prerequisites: PQB331    Equivalents: PCB634    Credit points: 12    Contact hours: 5 per week
Campus: Gardens Point    Teaching period: 2011 SEM-2

PQB642 CHEMICAL RESEARCH
This unit addresses a selection of topics in advanced chemistry from a range of evolving areas of relevance in modern chemistry and chemical technology such as nanotechnology, drug design, free-radical chemistry and trace metal speciation in environmental and biological 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: 2011 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: 2011 SEM-1

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 and 2011 SEM-2

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 biophysical levels.

Antirequisites: LQB182, LSB118    Credit points: 12    Contact hours: 4 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 effect 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. SCB121 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

**SCB131 EXPERIMENTAL CHEMISTRY**
Chemistry is the central science. A detailed study of chemistry and related disciplines requires the development of practical laboratory skills for synthesis and chemical analysis. This unit is designed specifically to develop these aspects of chemistry. 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. The aim of this unit is to develop a broad knowledge of, and the practical skills required for, scientific experiments in chemistry. The skills acquired in this unit are transferable to other practical sciences including medical science, biochemistry, molecular biology and pharmacy.

**Prerequisites:** SCB113 or PQB105 or (SCB111 and SCB121). SCB121 can be concurrently enrolled with SCB131  
**Credit points:** 12  
**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

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