Bachelor of Applied Science (Medical Science) (LS37)

Year offered: 2010
Admissions: Yes
CRICOS code: 020331D
Course duration (full-time): 3 Years
Course duration (part-time): 6 Years
Domestic fees (indicative): 2010: CSP $2,150 (indicative) per semester
International Fees (indicative): 2010: $12,000 (indicative) per semester
Domestic Entry: February
International Entry: February and July (Conditions apply for July entry)
QTAC code: 418201
Past rank cut-off: 81
Past OP cut-off: 10
OP Guarantee: Yes
Assumed knowledge: English (4, SA), Maths B (4, SA) and Chemistry (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: 300
Standard credit points per full-time semester: 48
Standard credit points per part-time semester: 24
Course coordinator: Ms Anne-Marie Christensen
Campus: Gardens Point

Why choose this course?
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Overview
The Bachelor of Applied Science (Medical Science) leads to a range of exciting career opportunities. The degree is the preferred qualification for employment in the pathology industry as a medical scientist. It gives you practical experience in the most up-to-date diagnostic techniques and the opportunity to learn from current professionals in the workplace.

Why Choose this Course?
This is the only medical science degree in Southern Queensland which is accredited with the Australian Institute of Medical Scientists (AIMS). In recent years more than 90 per cent of graduates seeking employment were successful within four months of graduation.

The course is designed in consultation with senior staff in pathology laboratories, so you will gain advanced knowledge of new diagnostic techniques used in the workplace. You will undertake practical classes in QUT's state-of-the-art laboratories, allowing you to graduate with extensive experience using equipment found in industry. You will undertake clinical placements in pathology laboratories giving you a chance to use your skills in a real workplace.

Career Outcomes
Scientists in the pathology industry perform tests on human blood or tissue and other forms of testing in the areas of immunology, haematology, microbiology, histopathology, cytology and biochemistry. You may decide to specialise in areas such as leukaemia diagnosis, cytogenetics, stem cell manipulation, tumour diagnosis, cytological diagnosis, DNA testing or forensic testing, or proceed to a managerial position within a pathology laboratory or hospital.

The course also provides a first degree for students wishing to undertake postgraduate studies in medicine. Graduates also have the opportunity to proceed to postgraduate studies leading to a career in medical research. Graduates are currently working as researchers in areas such as malaria, virology, stem cells, immunology and molecular biology.

Professional Recognition
Graduates are immediately eligible for graduate membership of the Australian Institute of Medical Scientists (AIMS) and will have completed the academic requirements for admission as full members.

Other Course Requirements
Work Experience Program: This course includes a mandatory Summer Program between years two and three of the full-time course. During the Summer Program you will be required to undertake a minimum six-week work experience program in a practising pathology laboratory. Proof of successful vaccination against Hepatitis B must be provided at the end of first semester of the second year of the course.

Your course
Year 1
The Bachelor of Applied Science (Medical Science) commences with a solid grounding in life sciences, mathematics, chemistry and physics. You will undertake further intensive study in human physiology, anatomy, cell and molecular biology. With QUT's practical approach to teaching, you will not only learn the theory, but gain a wealth of practical experience in QUT's state-of-the-art laboratories.

Year 2
You will proceed to the topics of biochemistry, microbiology and pathology before sampling various specialisations like immunology, haematology and histopathology. During
practical classes you will learn the latest techniques used in the pathology industry and improve your skills to professional standards. At the end of the year you will be ready to undertake a six-week placement in a pathology laboratory to further develop your skills under the guidance of professionals in the workplace.

Year 3
The final year builds on the key areas of biochemistry, microbiology, immunology, haematology, histopathology and introduces immunohaematology. You will develop your skills to an advanced level and further refine your laboratory techniques to ensure that, when you graduate, you will be ready to operate confidently in the workplace. You can take advantage of QUT’s close links with the pathology industry to further enhance your employment prospects.

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

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

Find out more on deferment.

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

Course Coordinator
Ms Anne-Marie Christensen
Phone: +61 7 3138 2782
Email: enquiry.scitech@qut.edu.au

Full-time Course Structure

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Part-time Course Structure - For students who will commence in 2010, and who commenced in 2009

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**Part-time Course Structure - For students who commenced in 2008**

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**Potential Careers:**
Biochemist, Clinical Laboratory Scientist, Medical Scientist, Microbiologist, Operations Manager, Pathology Scientist.

**UNIT SYNOPSES**
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: 5 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 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: 2010 SEM-1

LSB255 HUMAN ANATOMY
The medically oriented biological scientist requires a detailed understanding and knowledge of human anatomy. This unit exposes the student to the theoretical and practical facets of both microscopic and macroscopic anatomy of the human body with the emphasis on the microscopic anatomy.
Prerequisites: SCB112 or LSB118 Antirequisites: LSB152 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-2

LSB325 BIOCHEMISTRY
The study of biochemistry and cell biology, along with anatomy and physiology, provides students with the knowledge required for the proper understanding of the structure and function of the human body and its organ systems in health and disease, as a preparation for their clinical studies.
Prerequisites: SCB121 or SCB113 Antirequisites: LSB275, LSB381, LSB481 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-1

LSB365 PATHOLOGY
Pathology introduces students to the study of the disease processes underlying the major diseases of human organ systems. General disease processes of the major specific diseases of the organ systems are introduced, and then become the focus in systematic pathology. An understanding of general and systematic pathology is fundamental to the application of basic biomedical knowledge to clinically relevant states and the major diseases. This unit provides students with the foundation knowledge needed for subsequent clinical semesters. On completion of this unit, students should know, understand and be able to apply facts, concepts and terms related to disease processes and the major diseases occurring in the organ systems.
Prerequisites: LSB250 and LSB255 Credit points: 12 Contact hours: 5 per week Campus: Gardens Point Teaching period: 2010 SEM-1

LSB425 QUANTITATIVE MEDICAL SCIENCE
This unit integrates physics, chemistry, biochemistry, maths and statistics for applications to chemical analysis, as preparation to clinical biochemistry.
Prerequisites: LSB325 and MAB141 Antirequisites: LSN425 Credit points: 12 Contact hours: 5 per week Campus: Gardens Point Teaching period: 2010 SEM-2

LSB435 DIAGNOSTIC MICROBIOLOGY I
This unit builds on foundation topics in Microbiology 1 and starts preparing the student for a career in a routine diagnostic microbiology laboratory. The overall theme is the
diagnosis of human infectious diseases with bacteriology and parasitology the two key focus areas. This unit emphasises a strong commitment to professional practice by developing high level generic and specific skills. Specific lecture and lab class discussion points include (where relevant): life cycles; pathogen acquisition; infectious disease diagnosis pathways; classification systems; clinical presentations; diagnostic protocols and patient management. Students are encouraged to think critically and to discuss issues in an interactive and supportive learning environment.

**Prerequisites:** LSB386  
**Antirequisites:** LSB486, LSB547  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**LSB438 IMMUNOLOGY 1**  
The mechanisms of the immune process including the nature of antigens, antibodies, antigen-antibody reactions, antibody formation, control of the humoral and cell-mediated immune responses, and immunisation of humans against infections are addressed in this unit.

**Prerequisites:** LSB386 and LSB250  
**Antirequisites:** LSN438  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**LSB465 HISTOPATHOLOGY 1**  
Histopathology and cytology are essential components of pathological diagnosis and major clinical disciplines in Medical Laboratory Science. The unit aims to impart a working knowledge of basic techniques used in clinical histopathology and research histology laboratories and the techniques involved in the current practice of diagnostic cytology.

**Prerequisites:** LSB365 and SCB113 and LSB255  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**LSB480 PROFESSIONAL PRACTICE**  
Introduces students to the pathology laboratory workplace. The student undertakes a six week work experience program in a city or country pathology laboratory during the summer vacation between semesters 4 and 5 of the full-time course and between semesters 8 and 12 of the part-time course.

**Prerequisites:** LSB425 and LSB435 and LSB465  
**Assumed knowledge:** Students are expected to have completed four semesters of their course prior to enrolment in this unit.  
**Credit points:** 12  
**Campus:** Gardens Point  
**Teaching period:** 2010 SUM

**LSB525 CLINICAL BIOCHEMISTRY 1**  
This course of study (along with LSB625 Clinical Biochemistry 2) provides the graduating scientists with sufficient biochemical knowledge and laboratory experience to work effectively in both the smaller general-purpose laboratory performing a limited number of biochemical tests and the larger specialised laboratory performing in-depth studies of all aspects of clinical biochemistry.

**Prerequisites:** LSB425  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**LSB535 MICROBIAL IMMUNOLOGY**  
This unit builds on the concepts developed in Immunology 1 to introduce students to the life cycles of a variety of pathogens, particularly viruses, and the mechanisms employed by a host to avoid infection.

**Prerequisites:** LSB438  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**LSB555 HAEMATOLOGY 1**  
This unit introduces the discipline of haematology and the routine procedures performed in the haematology section of a pathology department, and introduces the concepts of anaemia and its investigation. This unit provides a detailed understanding of the common erythrocyte disorders. Diagnostic procedures, aetiology, pathophysiology, clinical manifestations and treatment of each disorder are included.

**Prerequisites:** LSB325, LSB365, and LSB465  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**LSB565 HISTOPATHOLOGY 2**  
Histopathology is an essential component of pathology and one of the major clinical disciplines in Medical Laboratory Science. Students are introduced to advanced techniques and methods of handling histopathological specimens. Students acquire sufficient scientific and technical expertise to enable them to carry out and to understand a range of techniques used routinely in clinical histopathology and histology research laboratories.

**Prerequisites:** LSB365 and LSB465  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**LSB625 CLINICAL BIOCHEMISTRY 2**  
This course of study (along with LSB525) provides the graduating scientists with sufficient biochemical knowledge and laboratory experience to work effectively in both the smaller general-purpose laboratory performing a limited number of biochemical tests and the larger specialised laboratory performing in-depth studies of all aspects of clinical biochemistry.

**Prerequisites:** LSB525  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**LSB635 DIAGNOSTIC MICROBIOLOGY 2**
This advanced level unit completes the preparation of the student for a career in a routine diagnostic microbiology laboratory by building upon foundation topics covered in LSB435. The overall theme is human infectious disease diagnosis with bacteriology, mycology and parasitology the three key focus areas. This unit continues a strong commitment to professional practice by developing high level generic and specific skills. Specific discussion points include (where relevant): life cycles, pathogen acquisition, infectious disease diagnosis pathways, classification systems, clinical presentations, diagnostic protocols and patient management. Students are encouraged to think critically and to discuss issues in an interactive and supportive learning environment.

**Prerequisites:** LSB435  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**LSB655 HAEematology 2**

This unit is designed to provide you with an up to date understanding of the common white blood cell and haemostatic disorders routinely encountered in a haematology laboratory, as well as their diagnosis, treatment, significance and prognosis for the patient being investigated.

**Prerequisites:** LSB555  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**LSB665 ImmunoHaematology**

This unit is designed to provide students with an understanding of the antigens, immune mechanisms and clinical factors involved in blood transfusion and tissue transplantation.

**Prerequisites:** LSB535 and LSB555  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**MAB141 Mathematics and Statistics for Medical Science**

This unit includes: mathematics (functions, limits and continuity; differentiation of functions and applications of differentiation; solutions of equation by iteration; interpolation methods; integration and applications of integration); statistics (data collection; exploring, presenting and modelling data; Normal distribution; hypothesis testing and confidence intervals for means and proportions; one-way and two-way ANOVA; simple and multiple regression; design of experiments). These topics are presented in the context of medical science. Students must have completed four semesters of Senior Mathematics B with an exit level of Sound Achievement or better, or have passed MAB105.

**Antirequisites:** MAN101  
**Assumed knowledge:** Grade of at least Sound Achievement in Senior Mathematics B (or equivalent) or MAB105 is assumed knowledge.

**Equivalents:** MAB140  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**PCB150 Physics 1H**

This unit introduces basic physical measurements, mechanics, heat, waves, acoustics and optics, and the instrumentation used to measure physical parameters.

**Credit points:** 12  
**Contact hours:** 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

**SCB113 Chemistry for Health and Medical Science**

A challenging chemistry unit designed for students undertaking health and/or medical science degrees. A range of topics from sub-discipline areas of general, physical and organic chemistry are covered. General/physical chemistry content includes atomic and molecular structure, electronic structure, bonding, molecular geometry, stoichiometry, thermochmistry, gases, kinetics, equilibrium, acids, bases, buffers, and electrochemistry. Organic chemistry content includes functional group chemistry, reaction mechanisms, stereochemistry, chirality as well as topics of biological significance including the chemistry of peptides, sugars and DNA. The unit is complemented by a practical program involving a range of experiments illustrating important chemical concepts.

**Antirequisites:** SCB111, SCB121  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**SCB122 Cell and Molecular Biology 1**

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

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

**SCB131 EXPERIMENTAL CHEMISTRY**

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

**Prerequisites:** SCB111 or SCB113  
**Corequisites:** SCB121 unless SCB113 has been successfully completed  
**Credit points:** 12  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2