Graduate Diploma in Biotechnology (LS76)

Year offered: 2010
Admissions: Yes
CRICOS code: 016975B
Course duration (full-time): 2 semesters (1 year)
Course duration (part-time): 4 semesters (2 years)
Domestic fees (indicative): 2010: Full fee tuition $7,250 (indicative) per semester
International Fees (indicative): 2010: $11,000 (indicative) per semester
Domestic Entry: July (Note: Students commencing in July, enroll in Semester 2 units first) *Also see "ENTRY REQUIREMENTS" below
International Entry: July (Note: Students commencing in July, enrol in Semester 2 units first) *Also see "ENTRY REQUIREMENTS" below
Total credit points: 96
Standard credit points per full-time semester: 48
Standard credit points per part-time semester: 24
Course coordinator: Dr Mark O'Brien
Campus: Gardens Point

Entry Requirements
A bachelor degree or equivalent, preferably but not necessarily in science, is required. Please contact the course coordinator for further information on the entry requirements for this course.

*LS76 commences in July (Module 1 entry). Students with advanced standing for Module 1 should commence in February as the Faculty does not offer sufficient units in Module 2 in second semester. Note especially that the February entry point for this course is for students with advanced standing for Module 1. It is not possible to commence Module 1 in February.

For students with advanced standing for Module 1 and who wish to enter LS76 in July, a modified program will be required and this should be discussed with the course coordinator prior to enrolment. Students should note that this may require them to study business electives only in their first semester and could lead to them having to take an additional semester to complete the requirements of their program.

Career Outcomes
Career opportunities include employment as research and support staff in the biotechnology industry - private or public biotechnology companies, universities, CSIRO, research institutes, government departments, pathology laboratories and hospitals.

Professional Recognition
Graduates are eligible to join the AusBiotech, the Australian Society for Biochemistry and Molecular Biology, and the Australian Society for Microbiology.

Course Design
The program of study for an individual student will be decided in consultation with the course coordinator and will take into account the student's background in the biomolecular sciences and area of interest in biotechnology. The LS76 Graduate Diploma in Biotechnology builds upon concepts covered in the foundation program, LS66 Graduate Certificate in Biotechnology. The Graduate Diploma in Biotechnology not only offers students opportunities to pursue study in several relevant focus areas including the theoretical and practical aspects of biotechnology, but also the business of biotechnology, marketing, commercialisation, as well as the legal and ethical aspects of biotechnological applications. The Graduate Diploma in Biotechnology is comprised of 96 credit points of assessed coursework. Advanced standing may be given for the suite of units offered in the foundation program, LS66 Graduate Certificate in Biotechnology, if the student has a bachelor degree or equivalent with a recent and appropriate undergraduate-level knowledge and practical experience in the key areas of molecular biology, cell biology, biochemistry and/or microbiology at an advanced level. If advanced standing is granted, students can enrol directly in LS76 in their first semester.

Overview
LS76 Graduate Diploma in Biotechnology is one of four nested postgraduate coursework programs in biotechnology offered by the School of Life Sciences. The Graduate Diploma in Biotechnology will suit anyone who has a recent undergraduate degree (preferably, but not necessarily in science) and who wishes to gain training and advanced specialisation in general, medical and/or plant biotechnology. The program also caters for working scientists, support staff, or students involved in commercial aspects of biotechnology, who wish to update their theoretical and practical biotechnology skills for a current or future position. Science-based biotechnology units emphasise laboratory skills and hands-on laboratory experimentation feature prominently in the program, which covers contemporary techniques in biotechnology. New technology is incorporated as it becomes available. The program also offers students opportunities to pursue studies related to the business of biotechnology, marketing, commercialisation, as well as the legal and ethical aspects of biotechnological applications. LS76 Graduate Diploma in Biotechnology, a one year full-time program, builds upon the
knowledge and skills base developed in the Graduate Certificate in Biotechnology and allows the student to stream into either medical or plant biotechnology or both.

Further Information
For further information about this course, please contact:
Dr Mark O'Brien
Phone: +61 7 3138 2782
Email: enquiry.scitech@qut.edu.au

Course structure - Full-time

Year 1, Semester 2 (MODULE 1)
LSN101 Molecular Biosciences
LSN102 Cellular Biosciences
LSN103 Postgraduate Learning and Research Skills
LSN483 Molecular Biology Techniques

Year 2, Semester 2 (MODULE 1)
LSN103 Postgraduate Learning and Research Skills
LSN483 Molecular Biology Techniques

Year 3, Semester 1 (MODULE 2)
LQB583 Genetic Research Technology
Or
LQB585 Plant Genetic Manipulation
In consultation with the course coordinator, choose 24 credit points from the following units:
LQB582 Biomedical Research Technologies
LQB583 Genetic Research Technology
LQB585 Plant Genetic Manipulation
GSN408 Fundamentals of Marketing Management
LWN135 Law, Justice and New Genetic Technologies

Course structure - Part-time

Year 1, Semester 2 (MODULE 1)
LSN101 Molecular Biosciences
LSN102 Cellular Biosciences

Year 2, Semester 2 (MODULE 1)
LSN103 Postgraduate Learning and Research Skills
LSN483 Molecular Biology Techniques

Year 3, Semester 1 (MODULE 2)
LQB583 Genetic Research Technology
Or

Potential Careers:
Biochemist, Biotechnologist, Medical Biotechnologist, Microbiologist, Molecular Biologist, Plant Biotechnologist, Research Assistant, Scientist, Virologist.

UNIT SYNOPSISES

GSN408 FUNDAMENTALS OF MARKETING MANAGEMENT
This unit provides students with the opportunity to critically examine and evaluate the role of marketing and its contribution to the strategic processes of the modern firm operating in an increasingly competitive national and international environment. Key marketing decision areas are examined, including the marketing concept, the marketing mix, marketing information systems and marketing research, market segmentation, targeting and positioning, and the process of marketing planning, implementation and control. Students have the opportunity to consider the evolution of marketing philosophy, determinants of consumer and organisational behaviour and the influences of environmental forces on marketing decision-making within the firm.

Antirequisites: GSN206 Equivalents: GSZ408 Credit points: 6 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2010 6TP1, 2010 6TP3 and 2010 6TP4

LQB582 BIOMEDICAL RESEARCH TECHNOLOGIES
This unit will study the technical principles and practical techniques that are essential for advancing research and development in biochemistry and biotechnology.
Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-1

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

**Prerequisites:** LQB483  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**LQB585 PLANT GENETIC MANIPULATION**

The potential of plant biotechnology can only be recognised as a result of the significant advances being made in technologies enabling the genetic manipulation of plants. Familiarity with the strategies, techniques and breadth of applications is essential as a basis for anyone planning a career in plant biotechnology. The unit is designed with a significant emphasis on achieving technical expertise in plant genetic manipulation and control of gene expression.

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

**LQB681 BIOCHEMICAL RESEARCH SKILLS**

In the real world, the design and completion of successful research and/or business projects demand that individuals gather information, solve problems, work effectively as a part of a team and analyse and communicate results in a critical manner. This unit offers opportunities for you to develop these skills that are valued highly by potential employers and research project leaders. This unit is a capstone biochemistry unit designed to prepare you as a prospective graduate for independent and group research.

**Prerequisites:** LQB381 or LSB308. Students with equivalent study can apply for a requisite waiver  
**Equivalents:** LSB607  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**LQB682 PROTEIN BIOCHEMISTRY AND BIOENGINEERING**

This unit is designed to give you the essential concepts and techniques driving research and industrial biotechnology so that you will be equipped for multiple careers in the biological sciences. The skills you develop will allow you to enter a practical laboratory environment or to apply your knowledge in related areas of evaluations of technologies and intellectual property.

**Prerequisites:** LQB381 or LSB308 or LSN101 and LSN102  
**Antirequisites:** LSB605, LSB608  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**LSN101 MOLECULAR BIOSCIENCES**

This unit explores the relationships between cellular components and provides a high level of understanding of cell and molecular biology suitable for students wishing to undertake further postgraduate studies. You will study: both informational and structural macromolecules found within the cell and relate their structure to function; cell metabolism; cell division, including DNA replication, transcriptional regulation in prokaryotes and gene regulation in eukaryotes; inheritance; and introductory bioinformatics.

**Corequisites:** LSN102, LSN483  
**Assumed knowledge:** Students should enrol in either LSN102 or LSN483 in the same semester if not already completed  
**Credit points:** 12  
**Contact hours:** 5 hours  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**LSN102 CELLULAR BIOSCIENCES**

The unit examines the responses available to cells and tissues in normal growth and development and following exposure to injury or stress mechanisms. The role and control of these responses in a range of disease processes is considered. The unit is designed to present, at the level of cell and tissue systems, the effects of physical, chemical, biochemical and metabolic processes. Successful completion of this unit provides a fundamental understanding of cellular structure and function, and prepares students for further postgraduate studies in cell and molecular biology. Additionally, students gain an appreciation of contemporary methods for studying the structure and function of cells and tissues.

**Corequisites:** LSN101, LSN483  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**LSN103 POSTGRADUATE LEARNING AND RESEARCH SKILLS**

This unit assists you in developing of a range of generic and specific skills and attributes to be a successful postgraduate student. On completion of the unit, you will: (i) know how to manage information tools and resources effectively in order to advance your university study and become an independent and competent learner (ii) build and increase your knowledge and competence in using basic software applications and general knowledge of information communication technologies and (iii) develop key skills in project design and management. This unit consists of a series of workshops, seminars and on-line tutorials presented by a team of teaching and learning support staff from across the university.

**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2
LSN483 MOLECULAR BIOLOGY TECHNIQUES
This unit introduces students to the theory and practice of
general molecular biology techniques for gene detection
and analysis, gene isolation, cloning and amplification, and
gene library construction and screening. The unit is
designed with a significant emphasis on achieving technical
expertise in a range of procedures for isolation, purification
and genetic engineering of nucleic acids.
Corequisites: LSN101, LSN102  Assumed knowledge:
Students should enrol in either LSN101 or LSN102 in the
same semester if not already completed.  Equivalents:
LQB483, LSB468  Credit points: 12  Contact hours: 5
per week  Campus: Gardens Point  Teaching period:
2010 SEM-2

LSP127 BUSINESS ASPECTS OF BIOTECHNOLOGY
Supporting a successful biotechnology industry in Australia
requires an entrepreneurial framework to be developed
which assists the efforts of both researchers and innovators.
This unit integrates those essential entrepreneurial
techniques of launching a biotechnology business. The unit
focus is on the research and development of industrial
products and commercialising innovations developed in this
industry. On completion of this unit the student will be able
to identify and analyse entrepreneurial opportunities and
evaluate these opportunities within biotechnology together
with the ability to identify and comprehend the steps
involved in setting up a new biotechnology enterprise.
Credit points: 12  Contact hours: 5 per week  Campus:
Gardens Point  Teaching period: 2010 SEM-1

LWN135 LAW, JUSTICE AND NEW GENETIC
TECHNOLOGIES
Our ability to test, screen and manipulate the human
genoome is made possible by recent technological
breakthroughs in science. The science of genetics is not
new, but its public profile has never been higher. Current
initiatives in genetic knowledge have been described as an
international voyage of scientific discovery. The scientific
findings are prompting major rethinking of concepts of law
and justice. The legal community faces a perpetual
challenge in keeping pace with the revolution in genetics.
This unit looks at some legal implications of this revolution
and charts the major responses of our legal system to
modern genetics and biotechnology.
Credit points: 12  Contact hours: 26 hrs in total
Campus: Gardens Point  Teaching period: 2010 SEM-1

MGN409 INTRODUCTION TO MANAGEMENT
This unit examines the following: the functions and roles of
managers; concepts and principles and their practical
applications; the key management functions; areas of
planning, organising, staffing, directing and controlling;
production/operations management and the management of
quality; entrepreneurship and business planning; and
important problems, opportunities and trends facing
managers in Australia analysed from the viewpoint of
relevant academic disciplines.
Antirequisites: GSN401 and GSZ401  Credit points: 12
Contact hours: 3 per week  Campus: Gardens Point
Teaching period: 2010 SEM-1 and 2010 SEM-2