

Master of Science (Bioinformatics) (MSBI) - MSc(Bioinf)

CRICOS code (International applicants): 064815J This program is pending CRICOS registration. Offers will not be issued to International students for these programs until CRICOS endorsement is granted. Please check the USQ website <http://www.usq.edu.au/handbook/current/sci/sci.html> for the latest information on program availability.

	On-campus
Semester intake:	Semester 1 (March) Semester 2 (July)
Campus:	Toowoomba
Fees:	Domestic full fee paying place International full fee paying place
Standard duration:	1 year full-time, 4 years part-time maximum

Contact us

Future Australian and New Zealand students	Future International students	Current students
Ask a question Freecall (within Australia): 1800 640 678 Phone (from outside Australia): +61 7 4631 5315 Email: studysci@usq.edu.au	Ask a question Phone: +61 7 4631 5543 Email: international@usq.edu.au	Ask a question Freecall (within Australia): 1800 007 252 Phone (from outside Australia): +61 7 4631 2285 Email: usqassist@usq.edu.au

Program focus

The aim of this program is to provide previous graduates from the life sciences or IT with a broad and highly multidisciplinary education in mathematical, computational and biological techniques and studies in other emerging areas of interest to them, for example, Systems Biology, Advanced Bioinformatics, Molecular Technologies, Proteomics and Genomics.

Program aims

This program aims to provide Bachelor of Science, Bachelor of Biomedical Science or Bachelor of Information Technology (or equivalent) graduates with advanced formal instruction to enhance their theoretical and practical skills in specified areas of bioinformatic sciences and a concurrent emphasis on training in cell molecular biology technologies. Candidates will also undertake training in investigative techniques. The program will provide a sound basis for candidates wishing to undertake further advanced research studies, as well as preparing them for scientific research and/or educational roles within the bioinformatics and molecular sciences.

Program objectives

At the completion of the program, graduates will be able to:

- demonstrate a sound knowledge of some important theories and techniques of bioinformatics and systems biology
- extend and use a wide range of computational and statistical techniques to formulate and solve complex problems from biological and biomedical sciences
- extend and apply computational or statistical tools to scientific and technical research in biology and medicine

- use a range of appropriate computer packages to solve problems in bioinformatics and systems biology developments
- extend and apply cell and molecular biology technologies for scientific research in biological and biomedical sciences
- better solve problems and think innovatively, learn new skills independently and efficiently
- demonstrate good communication skills in their professional skill base.

Admission requirements

Applicants may be admitted to the Master of Science (Bioinformatics) if they:

- hold an Australian Bachelor's degree or equivalent qualification from a recognised university in an area which is related to either information technology, mathematics, statistics or life sciences
- have introductory knowledge of computing generally equivalent to that found in [CSC1402 Foundation Computing](#) and have appropriate communication skills equivalent to those addressed in [CMS1000 Communication and Scholarship](#).

Particular choices of courses within this program may require additional pre-requisite knowledge depending on the applicant's undergraduate degree. In the case of applicants coming from a life science background, a typical pre-requisite to undertake some computing courses will be basic computer programming skills equivalent to [CSC2408 Software Development Tools](#). To undertake cell molecular biology courses applicants may require introductory knowledge of molecular biology equivalent to [BIO2209 Cell Biology](#).

International Applicants

International applicants must also have met the [University's English language requirements](#) or have completed the University's [ELICOS/UNIPREP](#).

How to apply

Domestic students

[Application for postgraduate programs](#) may be made directly to USQ. You should ensure you submit your application by the [closing dates](#).

International students

This program is offered to international students. An international student is a person who is not an Australian or New Zealand citizen and not an Australian permanent resident. Please refer to [USQ International](#) for information about entry requirements, visa arrangements and how to apply.

Program fees

Domestic full fee paying place

Domestic full fee paying places are funded entirely through the full fees paid by the student. [Full fees](#) vary depending on the courses that are taken. You are able to calculate the fees for a particular course via the [Course Fee Finder](#).

Domestic full fee paying students may be eligible to defer their fees through a Government loan called [FEE-HELP](#).

International full fee paying place

International students pay [full fees](#). Full fees vary depending on the courses that are taken and whether they are studied on-campus, via distance education/online. You are able to calculate the fees for a particular course via the [Course Fee Finder](#).

Program structure

The Master of Science (Bioinformatics) consists of 8 units of coursework. Courses can be selected from those listed below in the Coursework section, subject to the following conditions:

- complete the **8 core courses** listed below unless they have completed some of these courses in other USQ programs. In which case they may undertake elective with the approval of the Program Coordinator
- candidates who have completed courses or equivalents to Level 2 courses in the core program to a satisfactory level may seek exemption, but will be required to undertake an elective study approved by the Program Coordinator in lieu of the exemption
- at least four units of courses must be at Level 8
- all courses are on-campus (ONC) modes only.

Program completion requirements

To complete the program and be eligible for the award of the degree, candidates must demonstrate satisfactory progress in 8 approved courses of study within the prescribed time limits and satisfy the requirements of core courses and or elective courses of study as approved by the Program Coordinator.

Required time limits

Students have a minimum of 1 year or a maximum of 4 years to complete this program.

Elective courses

Students may take up to three units of elective courses other than those in the Coursework section. Study of these courses will require the approval of the Head of Department and will be assessed on the basis of their suitability for the intended program of work of the student by the Program Coordinator.

IT requirements

Students should visit the USQ [Recommended Hardware](#) and [Recommended Software](#) sites to check that their computers are capable of running the appropriate software and versions of Internet web browsers and to check the minimum and recommended standards for software.

Exemptions

Exemption may be granted where candidates have either completed Level 2 core courses or equivalents and or where candidates have completed courses in other USQ programs. However, candidates must complete another course of study approved by the Program coordinator in lieu of any exemption given..

Recommended enrolment pattern

Upon accepting a place in the program, students must consult the Program Coordinator, about the courses they wish to study. A suitable enrolment pattern for individual students will be constructed (subject to timetabling constraints) at that time.

Core Program

Semester 1 Core Courses	Semester 2 Core Courses
BIO8211 Bioinformatics	BIO8212 Experimental Bioinformatics
Elective [^]	BIO8213 Advanced Bioinformatics
BIO2209 Cell Biology ⁺	BIO8309 Advanced Molecular Biology
CSC3400 Database Systems	BIO3309 Molecular Biology

Footnotes

[^] [BIO8410 Special Study in Bioinformatics](#), [BIO8102 Immunopathology](#), [BIO8103 Infectious Diseases](#) or other appropriate course as approved by the program coordinator.

⁺ Candidates who have completed courses or equivalents of Level 2 courses in core programs to a satisfactory level may seek exemption, but will be required to undertake an approved elective course of study in lieu of the exemption.

Electives are available if students have already completed [BIO2209 Cell Biology](#) and [BIO3309 Molecular Biology](#) within the [Master of Biomedical Science](#).

Recommended electives

Semester 1 Courses	Semester 2 Courses
SCI4405 Research Practice and Ethics	SCI4405 Research Practice and Ethics
BIO4205 Introductory Medical Microbiology+#	BIO8410 Special Study in Bioinformatics*
BIO8410 Special Study in Bioinformatics*	BIO8101 Advanced Neuroendocrine Physiology
BIO8102 Immunopathology	BIO2205 Introductory Microbiology
BIO8103 Infectious Diseases	BIO2207 Genetics
Other course approved by Program Coordinator	Other course approved by Program Coordinator

Footnotes

- + Candidates who have completed courses or equivalents of Level 2 courses in core programs to a satisfactory level may seek exemption, but will be required to undertake an approved elective course of study in lieu of the exemption.
- # Web based course
- * [BIO8410 Special Study in Bioinformatics](#) is a course requiring a candidate to undertake a substantive literature review in a bioinformatics related area.

Candidates who have completed common courses in the [Master of Biomedical Science](#) will be required to undertake an approved elective course of study in lieu of the completed study. If a student is wishing to continue into a [Master of Science](#) (by research), then they should enrol in [SCI4405 Research Practice and Ethics](#).

List of approved elective courses

Course Code	Semester Offered
CSC2401 Algorithms and Data Structures	S1, S2
CSC2406 Web Publishing	S1
CSC2408 Software Development Tools	S2
CSC3400 Database Systems	S1
MAT2100 Algebra and Calculus II	S2
STA2300 Data Analysis	S1, S2
STA2301 Distribution Theory	S1
STA2302 Statistical Inference	S2
STA3301 Statistical Models	S2
BIO2201 Biochemistry 1	S1
BIO2203 Systems Physiology	S1
BIO2205 Introductory Microbiology	S2
BIO2207 Genetics	S2
BIO2209 Cell Biology	S1
BIO3301 Biochemistry 2	S2
BIO3309 Molecular Biology	S2
BIO3313 Pharmacology	S1
BIO3315 Medical Microbiology 2	S1
BIO3317 Medical Microbiology 1	S1
bio3333	S2
BIO4205 Introductory Medical Microbiology+#	S1
BIO8101 Advanced Neuroendocrine Physiology	S2
BIO8102 Immunopathology	S1
BIO8103 Infectious Diseases	S1

BIO8104 Special Study in Biomedical Science	S2
BIO8211 Bioinformatics	S1
BIO8212 Experimental Bioinformatics	S2
BIO8213 Advanced Bioinformatics	S2
BIO8309 Advanced Molecular Biology	S2
BIO8410 Special Study in Bioinformatics	S1, S2
sci4403	S1, S2
sci4405	S1, S2

Footnotes

- + Candidates who have completed courses or equivalents of Level 2 courses in core programs to a satisfactory level may seek exemption, but will be required to undertake an approved elective course of study in lieu of the exemption.
- # Web based course