Computational Biology

Year and Campus:	2016
Coordinator:	Associate Professor James McCaw
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Overview:	This is an interdisciplinary major that provides education in using computational and quantitative methods to address scientific questions at the interface of the life, mathematical, and computational sciences. There is great demand for computational and mathematical biologists in academia, industry, and government, where they are investigating problems as diverse as identifying the genetic basis of disease, to predicting how ecological systems will respond to climate change. In addition to completing core units that provide essential education in computational biology, students have the opportunity to specialise in one of computational biology's core disciplines – the life sciences, mathematics and statistics, or computer science. The major prepares students for graduate studies in either computational biology or traditional disciplines, as well as for entry into the job market. *PLEASE NOTE: The third year subjects of the Computational Bilogy major will become to available to students in 2017. Students can still complete the first and second year subjects leading to the major in preparation for the third year subjects becoming available.
Learning Outcomes:	Computational Biology major graduates should: # Demonstrate critical thinking through the ability to evaluate, analyse, and integrate information from a variety of sources # Be able to articulate theories, concepts, principles, and practices from the multiple disciplines that contribute to computational biology # Demonstrate ability to effectively communicate scientific ideas, orally and in writing to expert and non-expert audiences # Demonstrate a capacity for scientific reasoning and problem-solving, using research skills which draw on the features and methods of the different disciplines that inform computational biology # Demonstrate capacity to listen actively, consider different points of view, and work collaboratively with others to achieve a shared goal # Develop the ability to manage one's time, work independently and take initiative # Evaluate the contribution that computational biology makes in addressing problems facing contemporary societies, for example, health and disease, climate change, food security.
Structure & Available Subjects:	Completion of 50 points of study at Level 3.
Subject Options:	All three of:

Subject	Study Period Commencement:	Credit Points:
MAST30032 Biological Modelling and Simulation	Semester 1	12.5
BIOL30003 Case Studies In Computational Biology	Semester 2	12.5
MAST30033 Statistical Genomics	Semester 2	12.5

Plus one 12.5 points subject chosen from the following areas of study:

Anatomy (ANAT)
Biochemistry and Molecular Biology (BCMB)
Bioengineering Systems (BMEN)
Botany (BOTA)
Computer Science (COMP)
Cell and Developmental Biology (CEDB)
Environmental Science (EVSC)
Ecology (ECOL)

	Genetics (GENE) Informatics (INFO) Mathematics and Statistics (MAST) Microbiology and Immunology (MIIM) Neuroscience (NEUR) Pathology (PATH) Pharmacology (PHRM) Physiology (PHYS) Zoology (ZOOL)
Notes:	Students will be encouraged to complete a complementary study sequence in either biological/ biomedical science, mathematics and statistics, or computer science. A third year subject in this complementary sequence or from a list of electives makes up the computational biology major.
Related Course(s):	Bachelor of Science