BIOL30003 Case Studies In Computational Biology

Credit Points:	12.5
Level:	3 (Undergraduate)
Dates & Locations:	This subject is not offered in 2016.
Time Commitment:	Contact Hours: 48 hours: 24 x one-hour lectures (2 per week) and 12 x two-hour tutorial classes (1 per week). Total Time Commitment: 170 hours
Prerequisites:	

Subject	Study Period Commencement:	Credit Points:
BCMB20002 Biochemistry and Molecular Biology	Semester 1, Semester 2	12.5
COMP20008 Elements of Data Processing	Semester 1	12.5
GENE20001 Principles of Genetics	Semester 1	12.5
MAST30032 Biological Modelling and Simulation	Not offered 2016	12.5

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Contact:	**edmund.crampin@unimelb.edu.au (mailto:edmund.crampin@unimelb.edu.au)**
Subject Overview:	This subject will introduce current topics in computational biology, focusing on case studies in a number of different biological areas, and applying a range of different mathematical and computational data handling approaches to solve or interrogate biological problems. Each topic will be developed through a series of lectures introducing the biological topic (relying on a fundamental knowledge of the molecular basis of life gained in second year level genetics and biochemistry subjects), the types and sources of biological data, and the relevant computational approaches, based around case studies. A series of assignments in each of these topic areas, supported by tutorial classes, will illustrate the computational methodologies as they are applied to specific biological data. Indicative biological topics include applications of computational biology in: # Phylogenetics, population genetics and evolution # Ecological and environmental modeling (including geospatial and environmental decision making) # Bio-imaging and cell tracking in cell biology # Pathogenesis and immunology # Structural biology # Metabolic engineering and biotechnology
Learning Outcomes:	On completion of this subject, students should:

	# Appreciate the broad range of biological topics, types of data, and computational approaches that are used in computational biology # Have an appreciation for how different computational approaches are relevant and appropriate for specific types of biological data # Describe the measurement technologies and sources of quantitative data in biology # Be aware of online databases and repositories for quantitative biological data, and be able to access, download and manipulate biological data from online resources # Understand and be able to convert a biological problem into an appropriate computational problem
Assessment:	Six written assignments (10% each) based on topics developed in the lectures, each culminating in a short report, totalling not more than 3000 words (6x 500 words), due in weeks 3, 5, 7, 8, 10 and 12 (60%). One written 2-hour end-of-semester examination due in the examination period (40%). There is a hurdle requirement of a minimum 50% mark on examination for satisfactory completion.
Prescribed Texts:	None
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	# Time-management: the ability to meet regular deadlines while balancing competing commitments. # Ability to bring together knowledge from different disciplines to bear on a scientific or technological problem # Ability to find and use appropriate resources (including online) # Ability to communicate biological and computational knowledge effectively # Capacity for lifelong learning and professional development # Understanding of plagiarism, respect for honesty and intellectual integrity, and for the ethics of scholarship
Related Majors/Minors/ Specialisations:	Computational Biology Science-credited subjects - new generation B-SCI and B-ENG.