

Genetics

Year and Campus:	2009
Coordinator:	Professor Michael Hynes Department of Genetics Email: mjhynes@unimelb.edu.au
Overview:	Students completing a Genetics major will be prepared for careers or advanced study which involve the application of fundamental genetics, genomics, evolutionary, population and ecological genetics to all areas of biology, biomedical sciences and biotechnology. Graduates will develop knowledge and skills in the theory of genetics and molecular biology, population genetics and evolution and in experimental design, data recording and analysis and scientific writing, which are essential preparation for roles in universities, research institutes, government departments, hospitals and in the biotechnology industry. This major will integrate knowledge across the breadth of genetics, the application of experimental analysis to solving problems in biology. Students will gain experience preparing them for the workplace by participating in problem-solving, synthesis of information, written work, and independent as well as collaborative activities. The transferable skills developed in this major can be used in broad careers in science, including conservation, teaching, forensics, publishing, genetic counselling and research and in careers beyond the field of science.
Objectives:	By the end of this major a student will have: <ul style="list-style-type: none"> # knowledge of genes and genomes from the perspective of understanding population genetics, how evolutionary forces shape the gene pool, the impact of natural selection, and the processes of speciation; # understood how genomes are characterised and compared, how they are physically and genetically mapped and how this knowledge can be applied to understanding development, phylogenetics and human biology; # studied gene structure, function and regulation, which form the molecular basis of many important biological phenomena such as short-term organismal and cellular responses to rapid changes in environmental conditions and long-term controls of development; # used modern molecular approaches involved in combining classical genetics with recombinant DNA analysis and genomics and their application to specific biological problems; # applied laboratory techniques and analytical approaches in different areas of genetics including the analysis and interpretation of data derived from experiments; # gained experience in the written and oral presentation of scientific data and developed an appreciation of the scientific literature.
Subject Options:	Students completing a major in Genetics must complete the following subjects: <p>Second Year</p> Principles of Genetics A second year level practical subject in science (<i>must be approved by major coordinator</i>); this includes: Experiments in Genetics (<i>highly recommended</i>), Microbes: Infections & Responses, Techniques in Molecular Science or any other appropriate subject

Third Year

Evolutionary Genetics and Genomics
Genes: Organisation and Function
Genetic Analysis

One subject from:*

Human and Medical Genetics
Protein Structure and Function
Molecular Aspects of Cell Biology
Concepts in Cell and Developmental Biology
Ecological Principles
Evolution and the Human Condition
Functional Plant Biology
Plant Systematics and Evolution
Reproduction
Molecular and Medical Microbiology
Principles of Immunology

*Students will need to ensure that they meet the pre-requisite requirements for these third year major electives.

NB Complete information on third year level subjects will be published in the 2010 Handbook late 2009.

Subject	Study Period Commencement:	Credit Points:
652-214 Principles of Genetics	Semester 1	12.50
652-216 Experiments in Genetics	Semester 1, Semester 2	12.50
521-220 Techniques in Molecular Science	Semester 1, Semester 2	12.50
526-205 Microbes: Infections and Responses	Semester 2	12.50

Links to further information:

http://www.bbiomed.unimelb.edu.au/bachelor_of_biomedicine/course_structure

Related Course(s):

Bachelor of Biomedicine