

Genetics

Year and Campus:	2010																	
Coordinator:	Professor Michael Hynes Department of Genetics																	
Contact:	mjhynes@unimelb.edu.au (mailto:mjhynes@unimelb.edu.au)																	
Overview:	<p>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, including an integrated practical capstone subject in which the students develop an understanding of 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.</p>																	
Objectives:	<p>By the end of this major a student should have:</p> <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. 																	
Structure & Available Subjects:	<p>This major consists of:</p> <ul style="list-style-type: none"> # 50 credit points taken at third year level <p>In order to complete this major, students have to complete second year pre-requisite requirements 25 credit points at the second year level.</p>																	
Subject Options:	<p>Second Year:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Subject</th> <th style="width: 20%;">Study Period Commencement:</th> <th style="width: 20%;">Credit Points:</th> </tr> </thead> <tbody> <tr> <td>GENE20001 Principles of Genetics</td> <td>Semester 1</td> <td>12.50</td> </tr> </tbody> </table> <p>Plus one second year level, practical subject (as approved by the Major Coordinator) this includes:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Subject</th> <th style="width: 20%;">Study Period Commencement:</th> <th style="width: 20%;">Credit Points:</th> </tr> </thead> <tbody> <tr> <td>GENE20003 Experiments in Genetics</td> <td>Semester 1, Semester 2</td> <td>12.50</td> </tr> <tr> <td>BCMB20005 Techniques in Molecular Science</td> <td>Semester 1, Semester 2</td> <td>12.50</td> </tr> </tbody> </table>			Subject	Study Period Commencement:	Credit Points:	GENE20001 Principles of Genetics	Semester 1	12.50	Subject	Study Period Commencement:	Credit Points:	GENE20003 Experiments in Genetics	Semester 1, Semester 2	12.50	BCMB20005 Techniques in Molecular Science	Semester 1, Semester 2	12.50
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	MIIM20002 Microbes, Infections and Responses	Semester 2	12.50
	Third Year:		
	Subject	Study Period Commencement:	Credit Points:
	GENE30001 Evolutionary Genetics and Genomics	Semester 1	12.50
	GENE30002 Genes: Organisation and Function	Semester 1	12.50
	GENE30004 Genetic Analysis	Semester 2	12.50
	Plus one subject from:		
	Subject	Study Period Commencement:	Credit Points:
	GENE30005 Human and Medical Genetics	Semester 2	12.50
	BCMB30001 Protein Structure and Function	Semester 2	12.50
	BCMB30003 Molecular Aspects of Cell Biology	March	12.50
	ZOOL30004 Evolution and the Human Condition	Semester 1	12.50
	CEDB30002 Concepts in Cell & Developmental Biology	Semester 1	12.50
	BIOL30001 Reproduction	Semester 2	12.50
	MIIM30011 Molecular and Medical Microbiology	Semester 1	12.50
	MIIM30002 Principles of Immunology	Semester 1	12.50
Links to further information:	http://www.bbiomed.unimelb.edu.au/		
Related Course(s):	Bachelor of Biomedicine		