

Genetics

Year and Campus:	2010																													
Coordinator:	Professor Michael Hynes Department of Genetics																													
Contact:	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:	Completion of 50 points of study at third year level																													
Subject Options:	<p>All three of</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>GENE30001 Evolutionary Genetics and Genomics</td> <td>Semester 1</td> <td>12.50</td> </tr> <tr> <td>GENE30002 Genes: Organisation and Function</td> <td>Semester 1</td> <td>12.50</td> </tr> <tr> <td>GENE30004 Genetic Analysis</td> <td>Semester 2</td> <td>12.50</td> </tr> </tbody> </table> <p>Plus one elective selected from</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>BCMB30003 Molecular Aspects of Cell Biology</td> <td>March</td> <td>12.50</td> </tr> <tr> <td>CEDB30002 Concepts in Cell & Developmental Biology</td> <td>Semester 1</td> <td>12.50</td> </tr> <tr> <td>ECOL30006 Ecology in Changing Environments</td> <td>Semester 1</td> <td>12.50</td> </tr> <tr> <td>ZOOL30004 Evolution and the Human Condition</td> <td>Semester 1</td> <td>12.50</td> </tr> </tbody> </table>			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	Subject	Study Period Commencement:	Credit Points:	BCMB30003 Molecular Aspects of Cell Biology	March	12.50	CEDB30002 Concepts in Cell & Developmental Biology	Semester 1	12.50	ECOL30006 Ecology in Changing Environments	Semester 1	12.50	ZOOL30004 Evolution and the Human Condition	Semester 1	12.50
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	BOTA30003 Functional Plant Biology	Semester 1	12.50
	MIIM30011 Molecular and Medical Microbiology	Semester 1	12.50
	BOTA30002 Plant Systematics and Evolution	Semester 1	12.50
	MIIM30002 Principles of Immunology	Semester 1	12.50
	BCMB30001 Protein Structure and Function	Semester 2	12.50
	GENE30005 Human and Medical Genetics	Semester 2	12.50
	BIOL30001 Reproduction	Semester 2	12.50
Related Course(s):	Bachelor of Science		