652-302 Molecular Genetics

Credit Points:	12.500
Level:	Undergraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: 36 lectures (three per week) Total Time Commitment: 120 hours
Prerequisites:	Genetics 652-214 and 652-215. BBiomedSc students: Genetics 652-214, 521-213 and 536-250.
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Associate Professor M Davis
Subject Overview:	Upon completion of this subject students should have: # developed a general understanding of the molecular structure of genes and the molecular basis of genetic processes, including the various mechanisms that regulate the expression of genes, in both prokaryotes and eukaryotes; # an appreciation of recently discovered molecular mechanisms for generating the diversity of gene products and controlling their expression; # an understanding of the basic techniques involved in recombinant DNA analysis and genomics, and application of these tools to solve specific biological problems and determine gene function using gene manipulation, gene inactivation and/or transfer of genes between organisms; # an ability to interpret data generated using standard molecular methods and an appreciation for, and understanding of, the way in which information in this field is obtained and presented through the study of primary research papers and review articles; and # acquired the basic concepts and knowledge to enable them to critically appraise newly reported findings in molecular genetics and do more advanced courses in a wide range of areas of cellular and molecular biology. This subject focuses on 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 and pathologies such as heritable diseases and cancer. The molecular mechanisms underlying these phenomena are frequently exploited in biotechnology, medical and agricultural applications. The techniques used to study these processes often make use of endogenous mechanisms for gene disruption and gene transfer. The topics to be covered in this subject include prokaryotic gene structure, action and regulation; genomic and recombinant DNA methodology; eukaryotic gene structure, action and regulation; genetic manipulation of micro-organisms, plants and animals and genetic engineering; genome structure; prokaryotic and eukaryotic mobile DNA elements and their uses; and genetic control of the cell cycle.

Assessment:	One multiple-choice class test held mid-semester (10%); two online assignments/problem-solving tasks due during the semester (15%); a 3-hour written examination in the examination period (75%).
Prescribed Texts:	None
Breadth Options:	This subject is a level 2 or level 3 subject and is not available to new generation degree students as a breadth option in 2008. This subject or an equivalent will be available as breadth in the future. Breadth subjects are currently being developed and these existing subject details can be used as guide to the type of options that might be available. 2009 subjects to be offered as breadth will be finalised before re-enrolment for 2009 starts in early October.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Notes:	Students enrolled in the BSc (pre-2008 BSc), BASc or a combined BSc course will receive science credit for the completion of this subject.
Related Course(s):	Bachelor of Arts and Bachelor of Science Bachelor of Arts and Sciences Bachelor of Biomedical Science Bachelor of Science Graduate Diploma in Biotechnology