

BCMB30010 Advanced Techniques in Molecular Science

Credit Points:	12.50																		
Level:	3 (Undergraduate)																		
Dates & Locations:	2011, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus. Semester 2, Parkville - Taught on campus.																		
Time Commitment:	Contact Hours: one x 1 hour lecture and one x 5 hour practical class per week. Total Time Commitment: 72 contact hours with an estimated total time commitment of 144 hours.																		
Prerequisites:	<p>BSc students Before 2009: Biochemistry & Molecular Biology Part A (521-211) Biochemistry & Molecular Biology Part B (521-212) Techniques in Molecular Science (521-220) 2009 and subsequently:</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>BCMB20002 Biochemistry and Molecular Biology</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> <p>Note that the pre-2009 subject "Biochemistry & Molecular Biology Part A" and the 2009 subject "Biochemistry & Molecular Biology" are not identical despite having the same subject code. Only the subject "Biochemistry & Molecular Biology" offered in 2009 and beyond acts as a stand-alone prerequisite.</p> <p>BBiomedicine students</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>BIOM20001 Molecular and Cellular Biomedicine</td> <td>Semester 1</td> <td>25</td> </tr> <tr> <td>BCMB20005 Techniques in Molecular Science</td> <td>Semester 1, Semester 2</td> <td>12.50</td> </tr> </tbody> </table> <p>BBiomedSc students 521-213 Integrated Biomedical Science I 536-250 Integrated Biomedical Science II Other combinations of subjects that provide a similar background may be considered by the coordinator.</p>	Subject	Study Period Commencement:	Credit Points:	BCMB20002 Biochemistry and Molecular Biology	Semester 1, Semester 2	12.50	BCMB20005 Techniques in Molecular Science	Semester 1, Semester 2	12.50	Subject	Study Period Commencement:	Credit Points:	BIOM20001 Molecular and Cellular Biomedicine	Semester 1	25	BCMB20005 Techniques in Molecular Science	Semester 1, Semester 2	12.50
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BCMB20005 Techniques in Molecular Science	Semester 1, Semester 2	12.50																	
Corequisites:	None																		
Recommended Background Knowledge:	<p>BSc students Biochemical Regulation of Cell Function (521-212) at Level 2 is recommended. BBiomedicine Students Biochemical Regulation of Cell Function (521-212) at Level 2 is strongly recommended.</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>BCMB20003 Biochemical Regulation of Cell Function</td> <td>Semester 2</td> <td>12.50</td> </tr> </tbody> </table>	Subject	Study Period Commencement:	Credit Points:	BCMB20003 Biochemical Regulation of Cell Function	Semester 2	12.50												
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Non Allowed Subjects:	Students cannot enrol in and gain credit for this subject if credit was obtained for pre-2009 subjects (521-321) Gene Technology & Protein Expression or (521-322) Protein Biochemistry & Proteomics.																		
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. This subject requires all students to actively and safely participate in laboratory activities. Students who feel their disability may impact upon their participation are																		

	encouraged to discuss this with the subject coordinator and the Disability Liaison Unit: http://www.services.unimelb.edu.au/disability/
Coordinator:	Assoc Prof Paul Gooley, Dr Leon Helfenbaum
Contact:	leonh@unimelb.edu.au (mailto:bbencina@unimelb.edu.au)
Subject Overview:	<p>To participate in the rapidly expanding fields of genome research and protein structure-function analysis it is necessary to have an understanding of the techniques used in these areas. This course provides practical training in the technologies of molecular biology and protein expression and in the analysis of data derived from these techniques.</p> <p>Areas covered include the use of recombinant DNA for the investigation of gene function and the use of bacterial expression systems for the production and analysis of recombinant proteins. Specific experiments will deal with DNA cloning and sequencing, bioinformatics, enzyme expression and the analysis and identification of proteins using mass spectrometry. Students will learn how to maintain a laboratory notebook to record their experiments and how to compose a scientific report.</p> <p>In addition, students will develop an appreciation for the current scientific literature and collaborate in student presentations.</p> <p>There may be the opportunity for some students to undertake relevant project work in one of the department's research laboratories instead of completing the set practical course (a quota will apply for project work).</p> <p>The experimental work is supported by a lecture series providing an overview of technologies used in class and addressing current advances in these areas.</p>
Objectives:	<ul style="list-style-type: none"> # to provide practical experience in a variety of techniques used in biochemistry and molecular biology. # to give instruction in the correct methods for keeping scientific records and writing scientific reports. # to provide experience in simple experimental design and problem solving. # to extend students' knowledge of the use of bioinformatics in the analysis of DNA and protein sequence data and in data derived by mass spectrometry. # to assist students in the evaluation of scientific literature and to develop skills in the presentation of scientific data in oral and written formats.
Assessment:	Ongoing assessment of laboratory skills throughout the semester (55%) divided between: practical management of the experimental program, maintenance of a laboratory notebook and a written research report submitted mid-semester. Group presentation of a scientific paper (10%); Database Tutorials (5%) 2-hour written examination in the examination period at the end of semester (30%) Attendance is compulsory. Students who miss more than 20% of this subject will not be eligible for final assessment
Prescribed Texts:	None
Recommended Texts:	Keith Wilson and John Walker, Principles and Techniques of Biochemistry and Molecular Biology (2005, 6th Ed) Cambridge University Press
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:	<p>On completion of this subject, students should have developed the following generic skills:</p> <ul style="list-style-type: none"> # Hands-on experience in a variety of techniques, generating results for analysis. # Design and execution of simple experiments. # Analysis of experimental data using spreadsheets and bioinformatics resources. # The ability to keep complete and accurate records of experimental results and to use these records to prepare a scientific report. # Evaluation and presentation of scientific literature to an audience. # The ability to interpret scientific literature and interpret data from electronic databases. # The capacity to integrate knowledge across disciplines. # The ability to comprehend a question, evaluate the relevant information and communicate an answer.

Notes:	<p>This subject is available for science credit to students enrolled in the BSc (both pre-2008 and New Generation degrees), BAsC or a combined BSc course. It is also available to students enrolled in BBiomedicine.</p> <p>Before the commencement of the semester, students must advise the Department of Biochemistry and Molecular Biology of their order of preference for the alternative practical sessions and the other subjects they will be taking.</p> <p>Students undertaking this subject will be expected to regularly access an internet-enabled computer.</p>
Related Course(s):	Bachelor of Science
Related Majors/Minors/ Specialisations:	Biochemistry and Molecular Biology Biomedical Biotechnology (specialisation of Biotechnology major) Biotechnology (pre-2008 Bachelor of Science) Science credit subjects* for pre-2008 BSc, BAsC and combined degree science courses