521-323 Advanced Techniques in Molecular Science

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 1, - Taught on campus. Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: one x 1 hour lecture and one x 5 hour practical per week Total Time Commitment: Not available
Prerequisites:	**BSc students** 521211 Biochemistry & Molecular Biology Part A 521212 Biochemistry & Molecular Biology Part B 521220 Techniques in Protein & Gene Technology **BBiomedSc students** 521213 Integrated Biomedical Science I 536250 Integrated Biomedical Science II Other combinations of subjects that provide a similar background may be considered by the coordinator
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students cannot enroll in and gain credit for this subejct if previously obtained credit 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.
Coordinator:	Mrs Beverley Bencina
Contact:	Mrs Beverley Bencina Email: **bbencina@unimelb.edu.au (mailto:bbencina@unimelb.edu.au)**
Subject Overview:	To participate in the rapidly expanding areas 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 techniques used in gene technology and protein expression and analysis. 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 analysis and identification of proteins using mass spectrometry. In addition, students will develop an appreciation for the current scientific literature and collaborate in student presentations. Students will learn how to maintain a laboratory notebook to record their experiments and how to compose a scientific report. The experimental work will be organised into elective streams, one of which will involve an opportunity to undertake relevant project work in one of the department's research laboratories (a quota will apply for project work). The experimental work will be supported by a lecture series addressing current advances in the technologies used in class.

Objectives:	# to provide practical experience in a variety of biochemical techniques # to give instruction in the correct methods for keeping scientific records and scientific report writing # 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 mass spectrometry data # to assist students in the evaluation of scientific literature and to develop skills in presentation of scientific data both orally and in a written format.
Assessment:	Ongoing assessment of laboratory skills and practical management of the experimental program throughout the semester (25%); a 2-hour written examination in the examination period at the end of the semester (30%); student presentations of scientific papers (10%) and maintenance of a laboratory notebook throughout the semester (17.5%) and a written research report of up to 2500 words submitted mid-semester (17.5%).
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:	On completion of this subject, students should have developed the following generic skills. # 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:	This subject is available for science credit to students enrolled in the BSc (both pre-2008 and new degrees), BASc or a combined BSc course. Students undertaking this subject will be expected to regularly access an internet-enabled computer
Related Majors/Minors/ Specialisations:	Biochemistry and Molecular Biology Biotechnology