521-307 Biomolecular Structure & Bioinformatics

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	This subject is not offered in 2009.
Time Commitment:	Contact Hours: 24 lectures (two per week) and 36 hours of practicals and workshops Total Time Commitment: 120 hours
Prerequisites:	521-301.BBiomedSc students: 521-213, 536-250 and 521-308.
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.
Subject Overview:	Students will acquire knowledge of the fundamental concepts of determination of protein and nucleic acid structure, and bioinformatics (computational molecular biology) necessary for those who wish to continue studies in relevant areas of structural biology, bioinformatics, protein engineering and rational drug design. Students will also gain an appreciation of the Human Genome Project and its impact on the developing fields of bioinformatics, structural genomics, protein pharmaceuticals and drug discovery. This subject gives an overview of the theory and application of methodologies for the determination and computational analyses of macromolecular structures using Nuclear Magnetic Resonance (NMR) spectroscopy, X-ray crystallography, protein molecular dynamics, protein fold recognition, and gene and protein database mining; and the biophysical methods for investigating macromolecular recognition and interaction. Subject content includes principles and practice of X-ray crystallography and NMR spectroscopy for determining the three-dimensional structures of biomolecular complexes; the application of X-ray crystallography and nuclear magnetic resonance spectroscopy to structural genomics, rational drug design and screening; use of gene and protein databases to detect biologically significant data; biophysical methods for determining the conformations of proteins and nucleic acids in aqueous solution; and molecular dynamics of proteins and the principles of macromolecular recognition including computer-based modelling. In addition to the specific skills gained through study of this subject, students should develop problem-solving and communication skills in tutorials and report writing.
Assessment:	Ongoing assessment of practical and laboratory work during the semester (30%); a 2-hour written examination in the examination period (70%).
Prescribed Texts:	None
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
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):	Graduate Diploma in Biotechnology