BCMB30001 Protein Structure and Function

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	This subject is not offered in 2014.
Time Commitment:	Contact Hours: three x 1 hour lecture and one x 1 hour tutorial per two weeks. Total Time Commitment: 40 contact hours with an estimated total time commitment of 120 hours (including non-contact time). Note: Students are required to attend or complete one (1 hour) computer-based tutorial for assessment. Remaining tutorials are not compulsory.
Prerequisites:	BSc students Before 2009: **Biochemistry & Molecular Biology Part A (521-211)** **Biochemistry & Molecular Biology Part B (521-212)** 2009 and subsequently: **Subject** | **Study Period Commencement:** | **Credit Points:** BCMB20002 Biochemistry and Molecular Biology | Semester 1, Semester 2 | 12.50 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 "**BCMB20002 Biochemistry & Molecular Biology**" offered in 2009 and subsequently acts as a stand-alone prerequisite. BBiomedicine students **Subject** | **Study Period Commencement:** | **Credit Points:** BIOM20001 Molecular and Cellular Biomedicine | Semester 1 | 25 Other combinations that provide similar background will be considered by the coordinator.
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students cannot enrol in and gain credit for this subject if previously obtained credit for pre-2009 subject **(521-301) Protein Structure, Design and Engineering**.
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Contact:	Subject Coordinator Assoc Prof Paul Gooley **prg@unimelb.edu.au (mailto:prg@unimelb.edu.au)** Administrative Coordinator Ms Irene Koumanelis

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Subject Overview:	This subject will describe the wide range of structures, functions and interactions of proteins and their importance in biological processes, biomedicine and biotechnology. Emphasis will be on the three-dimensional structure of proteins and their interactions with peptides, proteins, lipids, nucleic acids and other physiologically important molecules. We will describe experimental and computational techniques and how they help in determining and predicting protein structure and function, aid the design of new proteins and are used to develop new drugs. The subject matter addresses the general properties of protein structure; the major classes and topologies of proteins; evolution of sequence, structure and function; protein synthesis, folding, misfolding, targeting and trafficking; protein engineering for biotechnology; bioinformatics analysis of protein sequence and structure; binding of small molecules to proteins and drug design; protein-protein interactions; effects of mutations on tertiary structure, protein stability and biological functions; enzyme reaction kinetics and mechanisms. This subject is required for completion of a major in Biochemistry and Molecular Biology.
Learning Outcomes:	By the end of the subject the student should develop a critical appreciation of the current literature on protein structure and function. The student should understand and appreciate: # the impact of protein research on biomedicine and biotechnology. # the structural properties of proteins and the techniques used to study them. # the computational analysis of protein sequence and structure using bioinformatic and molecular graphic programs. # how protein engineering is used for investigating structure-function relationships. # how proteins interact with other molecules.
Assessment:	3 hour written exam held in examination period (70%) One 30-min written exam held mid-semester (7.5%) Either a second 30-min written exam held during semester or two data-analysis exercises held during semester (7.5%) Assignment of a maximum of 1000 words and including prepared figures due mid-semester (10%) A computer-based tutorial using molecular graphics due early in the semester (5%)
Prescribed Texts:	Mike Williamson “How proteins work?” 2012 Garland Science ISBN 978-0-8153-4446-9
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: # 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:	Students enrolled in the BSc (pre-2008 BSc), BASc or a combined BSc course will receive science credit for the completion of this subject. Students undertaking this subject will be expected to regularly access an internet-enabled computer.
Related Majors/Minors/ Specialisations:	Biochemistry and Molecular Biology Biomedical Biotechnology (specialisation of Biotechnology major) Biotechnology (pre-2008 Bachelor of Science) Genetics Genetics Genetics Immunology Microbiology Science credit subjects* for pre-2008 BSc, BASc and combined degree science courses Science-credited subjects - new generation B-SCI and B-ENG. Selective subjects for B-BMED