

Bioengineering Systems

Year and Campus:	2014																					
Coordinator:	Associate Professor David Grayden Department of Electrical and Electronic Engineering																					
Contact:	grayden@unimelb.edu.au																					
Overview:	<p>Students who have completed the Bioengineering Systems major will be able to rigorously integrate the fundamental mathematics of systems modelling with the fundamental sciences of biology, chemistry and physics in the formulation and solution of problems involving biomedical systems. More specifically, core skills and knowledge that will be developed include: fundamental scientific comprehension that will lead to accurate mathematical modelling of biological and engineering systems, analytical and abstract thinking, problem-solving and design skills, ability to carry out laboratory experiments to confirm possible solutions to complex problems. At all levels of this major, we will ensure the development of excellent communication skills that will enable our graduates to deliver complex scientific information in a clear and concise fashion. The Bioengineering Systems major will open up pathways for students leading to accredited professional or scientific research careers in biomedical engineering (through further study in the Masters in Engineering or PhD programs respectively), applied mathematics, applied science, teaching, management and finance.</p>																					
Learning Outcomes:	The objective of the bioengineering systems major is to contribute to the academic preparation of graduates who embody the University of Melbourne graduate attributes, as well as additional attributes more specific to the Bachelor of Science or the Bachelor of Biomedicine.																					
Structure & Available Subjects:	Completion of 50 points of study at Level 3.																					
Subject Options:	<p>All three of:</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>BMEN30005 Introduction to Biomechanics</td> <td>Semester 1</td> <td>12.50</td> </tr> <tr> <td>BMEN30007 Biocellular Systems Engineering</td> <td>Semester 2</td> <td>12.50</td> </tr> <tr> <td>BMEN30008 Biosystems Design</td> <td>Semester 2</td> <td>12.50</td> </tr> </tbody> </table> <p>Plus one of</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>BMEN30006 Fundamentals of Biosignals</td> <td>Semester 1</td> <td>12.50</td> </tr> <tr> <td>ELEN30012 Signals and Systems</td> <td>Semester 2</td> <td>12.50</td> </tr> </tbody> </table> <p>Note: Bachelor of Biomedicine students completing this major should expect to complete BMEN30006 Fundamentals of Biosignals. The structure of the B-BMED course together with subject prerequisite sequences would normally prevent a B-BMED student from being eligible to enrol in ELEN30012 Signals and Systems. However, if a B-BMED student satisfies the prerequisites for ELEN30012, enrolment in and completion of that subject will contribute to this major.</p>	Subject	Study Period Commencement:	Credit Points:	BMEN30005 Introduction to Biomechanics	Semester 1	12.50	BMEN30007 Biocellular Systems Engineering	Semester 2	12.50	BMEN30008 Biosystems Design	Semester 2	12.50	Subject	Study Period Commencement:	Credit Points:	BMEN30006 Fundamentals of Biosignals	Semester 1	12.50	ELEN30012 Signals and Systems	Semester 2	12.50
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Notes:	In addition to these four core subjects, students must complete either MAST20029 Engineering Mathematics OR both of MAST20009 Vector Calculus AND MAST20030 Differential Equations at Level 2.																					
Related Course(s):	Bachelor of Biomedicine Bachelor of Science																					