

# Bioengineering Systems

<b>Year and Campus:</b>	2009
<b>Coordinator:</b>	Associate Professor David Shallcross Department of Chemical and Biomolecular Engineering Email: dcshal@unimelb.edu.au
<b>Overview:</b>	Students who complete the Bioengineering Systems major will be able to rigorously integrate the fundamental mathematics of systems modelling with 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 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), applied mathematics, applied science, teaching, management and finance.
<b>Objectives:</b>	Students completing the program will be able to apply their engineering decision making and modeling skills to a wide range of real-life biomedical systems.
<b>Subject Options:</b>	<p>Students studying Bioengineering Systems major through the Bachelor of Biomedicine will be required to complete the following subjects:</p> <p><b>First Year</b> Calculus 2 Linear Algebra Engineering Systems Design 1</p> <p><b>Second Year</b> Engineering Computation Engineering Mathematics</p> <p><b>Third Year</b> Biosystems Modelling 1 Biosystems Modelling 2 Biosystems Design Fundamentals of Biosignals</p> <p>Those students entering the Bachelor of Biomedicine without VCE Specialist Mathematics can complete the Bioengineering Systems major by completing the following subject set:</p> <p><b>First Year</b> Calculus 1 Calculus 2 Engineering Systems Design 1</p> <p><b>Second Year</b> Engineering Computation Linear Algebra</p> <p><b>Third Year</b> Biosystems Modelling 1 Biosystems Modelling 2 Biosystems Design Engineering Mathematics</p> <p>If students without VCE Specialist Mathematics would like to complete the subject, Fundamentals of Biosignals, they will need to complete Linear Algebra over summer semester at the end of first year.</p> <p><b>NB</b> Complete information on third year level subjects will be available in the 2010 Handbook which will be published late 2009.</p>

	<b>Subject</b>	<b>Study Period Commencement:</b>	<b>Credit Points:</b>
	620-155 Calculus 2	Semester 1, Semester 2	12.50
	800-001 Engineering Systems Design 1	Semester 1, Semester 2	12.50
	620-156 Linear Algebra	Summer, Semester 1, Semester 2	12.50
	433-296 Engineering Computation	Semester 1	12.50
	620-293 Engineering Mathematics	Summer, Semester 1, Semester 2	12.50
<b>Links to further information:</b>	<a href="http://www.bbiomed.unimelb.edu.au/bachelor_of_biomedicine/course_structure">http://www.bbiomed.unimelb.edu.au/bachelor_of_biomedicine/course_structure</a>		
<b>Related Course(s):</b>	Bachelor of Biomedicine		