421-699 Forces, Fields and Flows in Bio Systems

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: 36 Hours; Non contact time commitment 84 Hours Total Time Commitment: Not available
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
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
Coordinator:	Dr Bruce Stuart Gardiner
Subject Overview:	This subject will explore well-developed engineering models in the context of biological systems. Topics covered include Maxwell's equations, fields and flows in electrolyte media, membrane transport behaviour, the electric double layer, stress and electrical force densities, Newtonian and non-Newtonian fluid mechanics, convective diffusion equations of mass transfer, equations of electrohydrodynamics, poroviscoelastic behaviour of biological tissues.
Objectives:	On successful completion, students should be able to: # develop a deeper understanding of various classical engineering theories # have an appreciation of the role of these theories in a multiphysics environment # describe the role of mathematical modelling in understanding biological systems # develop skills in qualitative description of biological systems # develop skills in constructing approximate models describing biological systems # develop skills in computer modelling of biological systems # have exposure to a range of problems in which biomedical engineers may play a role
Assessment:	One 2-hour examination (75%) and one assignment of 3000 words equivalent (25%).
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
Related Course(s):	Master of Biomedical Engineering Master of Engineering Science(Biomedical Enginering) Master of Engineering Structures