BMEN90022 Computational Biomechanics

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2012, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 48 hours Total Time Commitment: 120 hours
Prerequisites:	**(../../view/2011/BMEN30005)** **Subject** | **Study Period Commencement:** | **Credit Points:** BMEN30005 Biomechanics and Biotransport | Semester 1 | 12.50 OR **Subject** | **Study Period Commencement:** | **Credit Points:** MCEN30016 Mechanical Dynamics | Semester 1 | 12.50
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 Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Furtherdetails on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Contact:	Dr. David Grayden Email: **grayden@unimelb.edua.au (mailto:grayden@unimelb.edua.au)**
Subject Overview:	In this subject students should gain an understanding of the structure and function of the skeletal, muscular, and sensory systems of the human body. Students should also be able to formulate simple, integrative models of the human neuromusculoskeletal system; and to use computational models of the human body to analyse muscle function during activities like standing, walking, running and jumping.
Objectives:	On completing this course students should be able to - # Describe the various elements comprising a computational model of the human neuromusculoskeletal system # Formulate and solve differential equations that govern the motion of rigid-body (link-segmental) dynamical systems # Describe the mechanical properties of various soft tissues, especially muscle, ligament, and tendon # Formulate and solve differential equations that incorporate the major physiological properties of muscle, ligament, and tendon # Formulate simple, integrative models of the human neuromusculoskeletal system # Use computational models of the human body to study muscle function during movement

Assessment:	Four assignments distributed throughout the semester; students will have 3 weeks to complete each homework assignment (20%) One mid-semester exam of 1 hour duration (20%) One end-of-semester exam of 2 hours duration (60%)
Prescribed Texts:	TBA
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:	# Ability to apply knowledge of science and engineering fundamentals # Ability to undertake problem identification, formulation, and solution # Ability to utilise a systems approach to complex problems and to design and operational performance # Ability to communicate effectively, with the engineering team and with the community at large # Capacity for creativity and innovation # Ability to function effectively as an individual and in multidisciplinary and multicultural teams, as a team leader or manager as well as an effective team member
Notes:	Credit may not be obtained for both MCEN40006 (436-419) Computational Biomechanics AND BMEN90022 Computational Biomechanics
Related Course(s):	Bachelor of Engineering (Biomedical) Biomechanics Master of Biomedical Engineering
Related Majors/Minors/ Specialisations:	B-ENG Mechanical Engineering stream Master of Engineering (Biomedical) Master of Engineering (Mechanical)