

BMEN90030 BioDesign Innovation

Credit Points:	50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Year Long, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 72 hours Total Time Commitment: 800 hours
Prerequisites:	Entry into one of the following degrees: MC-ENG Master of Engineering (Biochemical), (Biomedical), (Chemical), (Civil), (Electrical), (Environmental), (Mechanical), (Software), (Spatial), (Structural). Completion of at least four level 9 Engineering subjects. Students must be within 125 points of completion of their degree, and enrolment in this subject requires approval of the subject coordinator. There is an application process for this subject, and students are required to have achieved a H2B average or better in their course.
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	<p>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.</p> <p>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</p>
Coordinator:	Prof David Grayden
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Subject Overview:	<p>AIMS</p> <p>BioDesign Innovation is a “real world” course in creating successful medical devices. The course is given over two semesters of one academic year and is composed of frontal lectures, practical training, and a guided project. The first semester focusses on identifying clinical needs, brainstorming and concept creation. The second semester focusses on concept development and business implementation. Teams of 2-3 students from engineering disciplines will team up with business students and with people from medical and law backgrounds to conceive and design an innovative medical device, taking it through all steps of development. The students in the teams will complete assessment items together, each member primarily contributing according to their specialisation. The teams will create an engineering prototype of their invention, draft a provisional patent application, and compose a detailed business plan. BioDesign Innovation is taught by a combination of academics, medical device entrepreneurs, corporate executives, intellectual property attorneys and venture capitalists. As such, it provides a unique opportunity to gain real world experience while still in an academic environment.</p>
Learning Outcomes:	<p>INTENDED LEARNING OUTCOMES (ILOs)</p> <p>Having completed this unit the student should be able to:</p>

	<ol style="list-style-type: none"> 1 Work as part of an interdisciplinary team to complete a technical project 2 Search, analyse and document clinical practice, engineering science and relevant literature in order to determine the need for further research and development in a chosen clinical area 3 Devise a methodology of investigation to research and apply established theories to an interdisciplinary body of knowledge and practice 4 Collect and analyse a range of data (both qualitative and quantitative) to analyse critically, reflect on and synthesise complex information, problems, concepts and theories in a chosen topic 5 Build a device or write software that helps to technologically address a clinical need 6 Develop a business plan, including market overview, regulation and reimbursement strategies and intellectual property (IP) strategies 7 Write a project report that follows good engineering science practice 8 Present oral presentations of the findings of the investigation to an specialist and non-specialist audiences.
Assessment:	<p>One team-based written assignment on a clinical need of approximately 2000 words per student, due in Week 7 of the first semester (approximately 50 hours of work). ILOs 1,2,3,4,7 are assessed in this written assignment. Due in week 7 of first semester (10%) One team-based written assignment on the medical device of approximately 2000 words per student, due in Week 10 of the first semester (approximately 50 hours of work per student). ILOs 1,2,3,4,7 are assessed in this written assignment. Due in week 12 of first semester (10%) One team-based oral presentation comprising 15 minutes per student during Week 1 of the second semester (approximately 100 hours of work per student). This presentation should provide a detailed description from the team of a clinical problem, a broad market review, an engineering concept of 3-4 solutions, regulation and reimbursement strategies, and IP challenges. ILOs 1,2,3,4,6,8 are assessed in this presentation. Due in week 1 of second semester (20%). A technical oral examination of no more than 30 minutes duration per student. Technical oral examination includes a formal presentation of 15 minutes per student followed by questions from an academic supervisor and academic examiner. ILOs 1,2,3,4,5,6,8 are assessed in this examination. Due in weeks 10-11 of second semester (10%). A lay person oral examination of no more than 15 minutes duration, supported by static display materials (e.g. poster, computer demonstration, prototype). ILOs 1,2,3,4,5,6,7,8 are assessed in this examination. Due in weeks 11-12 of second semester (10%) A professional research report of 5,000 words per student, excluding appendices or supporting material that can include diagrams, tables, computations and computer code/output, requiring approximately 200 hours of work due in week 12 of the second semester. ILOs 1,2,3,4,5,6,7 are assessed in this report. Due in week 12 of second semester (40%).</p>
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
Generic Skills:	<p>On completion of this subject, students should have developed the following skills:</p> <ul style="list-style-type: none"> # Ability to undertake problem identification, formulation and solution # Ability to utilise a systems approach to design and operational performance # Ability to function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member # Understanding of the principles of sustainable design and development # Understanding of the principles of research and development # Capacity for independent critical thought, rational inquiry and self-directed learning # Openness to new ideas and unconventional critiques of received wisdom.
Related Majors/Minors/Specialisations:	<p>Master of Engineering (Biomedical with Business) Master of Engineering (Biomedical)</p>