

436-285 Engineering Design and Materials 1

Credit Points:	12.50
Level:	2 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: Twenty-four hours of lectures and twenty-four hours of tutorials, guided design exercises and laboratory work Total Time Commitment: Not available
Prerequisites:	436-121 Introduction to Mechanical Engineering and 436-105 Mechanical Engineering and (100-level mathematics - 620-141 Maths A or 620-121 Maths A (Advanced); and 620-143 Applied Maths or 620-123 Applied Maths (Advanced)
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	<p><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></p>
Coordinator:	Assoc Prof Kenong Xia
Subject Overview:	<p>Unit 1, Engineering Design: Upon completion, students should comprehend fundamental concepts of engineering design through various stages of the design process; problem formulation and structuring, ideation, decision making and communication; have developed an awareness of the integrative nature of engineering design through the experience of balancing a range of factors, including uncertainties related to the environment; and have observed the close interrelation between the properties of engineering materials and the design process. Topics covered include general approach to design problems; invention, analysis, decision making; goal, objectives, criteria and constraints; strategies for synthesis and decision making; technical, ergonomic and economic factors; appraisal of benefit and cost; fault and failure analysis; probability, uncertainty, and assessment of risk; and interfacing geometric and mathematical models, sensitivity analyses, combinatorial search.</p> <p>Unit 2, Engineering Materials: Upon completion, students should have further developed their understanding of the behaviour of materials, aided by laboratory exercises based on topics covered in 436-121 Introduction to Mechanical Engineering (prior to 2005 436-101 Engineering Mechanics and Materials). Topics covered include fast fracture, fatigue, creep, diffusion, phase equilibrium and diagrams, and phase transformation.</p>
Objectives:	-
Assessment:	Unit 1: One 2-hour end-of-semester examination (50%). Four assignments of equal weight due throughout the semester not exceeding 25 pages or equivalent per student. (50%). Unit 2: One 2-hour end-of-semester examination of (80%). Three laboratory reports, each up to 2500 words plus up to 10 pages of supporting material (figures and tables), due throughout the semester (20%). Completion and submission of satisfactory laboratory and assignments is a prerequisite for admission to the written examinations.

Prescribed Texts:	None
Recommended Texts:	Information Not Available
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:	<ul style="list-style-type: none"> # ability to apply knowledge of basic science and engineering fundamentals # ability to communicate effectively, not only with engineers but also with the community at large # in-depth technical competence in at least one engineering discipline # ability to undertake problem identification, formulation and solution # ability to use 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 social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development # understanding of the principles of sustainable design and development # expectation of the need to undertake lifelong learning, capacity to do so # capacity for independent critical thought, rational inquiry and self-directed learning # intellectual curiosity and creativity, including understanding of the philosophical and methodological bases of research activity # openness to new ideas and unconventional critiques of received wisdom
Notes:	Students who have passed either 436-220 Engineering Design and Materials 1 OR 436-221 Engineering Design and Materials 2, MUST NOT enrol in this subject and must seek course advice.
Related Course(s):	Bachelor of Engineering (Biomedical) Biomechanics Bachelor of Engineering(Mechanical & Manufacturing) and Bachelor of Laws