MCEN90020 Advanced Materials

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 24 hours of lectures and 24 hours of project work Total Time Commitment: 200 hours
Prerequisites:	**Subject** / **Study Period Commencement:** / **Credit Points:** MCEN90014 Materials / Semester 1 / 12.50
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students cannot enrol in an gain credit for this subject and - # MCEN40015 Advanced Engineering Materials
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. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
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Subject Overview:	**AIMS** This subject focuses on advanced materials and their engineering applications. Selected metallic, ceramic and polymer materials and their composites are analysed in the context of applications. When relevant, the topics will be reinforced by introducing the latest development in research. The selected advanced materials may include light alloys, ferrous alloys, superalloys, intermetallic alloys, ultrafine and nano structured alloys, amorphous alloys, metal matrix composites, structural and functional ceramics, and/or structural and functional polymers. Students may be required to study engineering cases or research papers and/or conducting experiments in a laboratory. **INDICATIVE CONTENT** The selected advanced materials may include light alloys, ferrous alloys, superalloys, intermetallic alloys, ultrafine and nano structured alloys, amorphous alloys, metal matrix composites, structural and functional ceramics, and/or structural and functional polymers.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILOs)** Having completed this subject the student is expected to be able to - 1 Apply advanced engineering materials through applications and case studies 2 Describe emerging engineering materials and their potential applications 3 Analyse research papers in the area of materials engineering.

Assessment:	Two project reports of up to 3500 words each, in addition to supporting material such as figures and tables, to be submitted at the end of semester – Unit 1 report requiring approximately 40 to 50 hours work (40%); Unit 2 report requiring approximately 35 to 40 hours work (35%). A one hour in class test (10%). Oral presentation requiring approximately 20 hours work (15%). ILOs 1-3 will be assessed by two project reports (50% each) including possible oral presentations and/or oral exams on the reports.
Prescribed Texts:	None
Recommended Texts:	A diverse range of reference books will be recommended at the beginning of the semester.
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.
Notes:	**LEARNING AND TEACHING METHODS** The subject is delivered through a combination of lectures and projects. For e-learning, the lectures are recorded and made available to students through the University's online learning system. **INDICATIVE CONTENT** The selected advanced materials may include light alloys, ferrous alloys, superalloys, intermetallic alloys, ultrafine and nano structured alloys, amorphous alloys, metal matrix composites, structural and functional ceramics, and structural and functional polymers.
Related Course(s):	Master of Philosophy - Engineering Ph.D.- Engineering
Related Majors/Minors/ Specialisations:	B-ENG Mechanical Engineering stream Master of Engineering (Mechanical)