ELEN90026 Introduction to Optimisation

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	This subject is not offered in 2014.
Time Commitment:	Contact Hours: 36 hours of lectures Total Time Commitment: 200 hours
Prerequisites:	Enrolment in a research higher degree(Masters or PhD) in Engineering
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. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Contact:	Dr. Marcus Brazil Email: **brazil@unimelb.edu.au (https://mce_host/faces/htdocs/brazil@unimelb.edu.au)**
Subject Overview:	**AIMS** This subject provides a rigorous introduction to the mathematics of optimization, as used across all of science and particularly in engineering design. There is an emphasis on both the theory and application of optimization techniques, with a focus on fundamental areas such as convex optimization and/or discrete optimization. This subject is intended for research higher-degree students in engineering. **INDICATIVE CONTENT** Topics may include: # Convex sets and functions; # convex optimization problems; # duality theory; # algorithms for unconstrained optimization; # algorithms for constrained optimization; # discrete and combinatorial optimization; # computational complexity; # approximation algorithms.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** Having completed this subject it is expected that the student be able to: 1. Demonstrate an in-depth understanding of convex or discrete analysis within the context of optimization problems; 2. Formulate and solve engineering problems via convex or discrete optimization methods; 3. Apply computational tools to solve standard convex or discrete optimization problems.
Assessment:	Continuous assessment of homework assignments, not exceeding 40 pages in total over the semester, worth 40%; Final examination at the end of semester, worth 60%. Hurdle

	requirement: Students must pass the written exam to pass the subject. ILOs 1 to 3 are assessed in the final exam and the submitted assignments.
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:	# Ability to apply knowledge of basic science and engineering fundamentals; # In-depth technical competence in at least one engineering discipline; # Ability to undertake problem identification, formulation and solution; # Ability to utilise a systems approach to design and operational performance; # Expectation of the need to undertake lifelong learning, capacity to do so; # Capacity for independent critical thought, rational inquiry and self-directed learning; # Profound respect for truth and intellectual integrity, and for the ethics of scholarship
Notes:	**LEARNING AND TEACHING METHODS** The subject is delivered through lectures and homework assignments **INDICATIVE KEY LEARNING RESOURCES** Students are provided with lecture notes, including worked examples, assignment problems, and recommended reading lists comprising textbooks and journal articles. **CAREERS / INDUSTRY LINKS** Exposure to research literature and the rigour expected at the level of postgraduate study.
Related Course(s):	Master of Philosophy - Engineering Ph.D.- Engineering