ELEN90018 Adv Topics in Engineering Mathematics

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: Up to 36 hours of lectures Total Time Commitment: 200 hours
Prerequisites:	Enrolment in a research higher degree (MPhil 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/
Coordinator:	Prof Jonathan Manton
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Subject Overview:	**AIMS** This subject is intended to give students a rigorous introduction to a selection of foundational mathematical tools and techniques commonly employed in electrical, electronic and systems engineering. **INDICATIVE CONTENT** The course content will include a selection of topics from: # Optimisation # Graph theory and combinatorics # Probability theory # Measure theory # Functional analysis # Basic topology and geometry.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO's)** On completion of this subject, the student should have: 1 The ability to formulate a range of practical engineering problems in an appropriate mathematical framework 2 The ability to apply standard results from optimisation theory, probability theory and/or functional analysis to solve a range of relevant problems 3 An understanding of the usefulness of mathematics, and the importance of rigour.
Assessment:	The assessment will consist of: Continuous assessment, consisting of written homework assignments and/or project work or presentations, to be completed during the semester and

	not exceeding 30 pages in total (approximately 55-60 hours of work), worth 20% (addressing ILO's 1-3) A written examination, not exceeding 3 hours, at the end of semester, worth 80% (addressing ILO's 1-3).
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:	On completion of this subject, students will have developed the following 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 # 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 # Profound respect for truth and intellectual integrity, and for the ethics of scholarship.
Notes:	**LEARNING AND TEACHING METHODS** This 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):	Doctor of Philosophy - Engineering Master of Philosophy - Engineering