421-682 Engineering Systems Management

Credit Points:	12.500
Level:	Graduate/Postgraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: 36 Hours; Non contact time commitment 84 Hours Total Time Commitment: Not available
Prerequisites:	None
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 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. 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
Coordinator:	Russell Thompson
Subject Overview:	Contemporary business requires intelligent and integrated decision making tools for effectively managing increasingly complex physical systems. Modelling and evaluation techniques that incorporate a range of key stakeholder objectives and interactions are developed. Procedures for identifying innovative solutions that increase the sustainability, reliability and security of engineering systems are presented. A range of analytical techniques that allow decision support systems to be developed for improving the performance of physical systems are covered. Case studies are used to illustrate how computational methods can be applied to more effectively manage systems such as supply chains, energy production and telecommunication networks.
Assessment:	One three-hour written examination (50%) and one written assignment of approximately 2,500 words or equivalent (50%).
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 successful completion, students should be able to: # define an appropriate set of objectives and performance measures for a system that reflect the diverse requirements of key stakeholders # specify the functional requirements of a decision support system # adapt meta-heuristic techniques to optimise the performance of complex engineering networks # develop procedures for optimising engineering systems including project scheduling, resource allocation, facility location and production and distribution processes # identify the most appropriate modelling paradigm for predicting the demand for technology or an engineering related product or service based on historical data # determine the major factors that influence demand and estimate their relative effect

	# develop procedures for simulating complex interactions and stochastic phenomena # use simulation models to evaluate design options of engineering processes # replicate interactions between key stakeholders using agent based modelling approaches # apply multi-objective evaluation techniques incorporating a range of quantitative and qualitative data to identify sustainable solutions considering the financial, economic, environmental and social effects # provide information to decision makers and interested parties in a comparable form, highlighting the trade-off's between potential solutions # design information systems that can incorporate real-time data and respond to unexpected events # develop adaptive learning based systems that can automatically detect and manage incidents in real-time by monitoring conditions and controlling responses to improve reliability and reduce vulnerability # utilise risk analysis methods to identify critical parameters that have the potential to threaten the achievement of a systems objectives # develop analytical methods for incorporating knowledge and learning within decision making processes
Related Course(s):	Master of Development Technologies Master of Engineering Management Master of Engineering Science (Engineering Management) Master of Engineering Structures Master of Utilities Management