CVEN30008 Engineering Risk Analysis

Credit Points:	12.5
Level:	3 (Undergraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 hours (Lectures: 2 hours per week; Tutorials: 1 hour per week) Total Time Commitment: 170 hours
Prerequisites:	**Undergraduate students:** ONE OF the following subjects: **Subject** / **Study Period Commencement:** / **Credit Points:** MAST10007 Linear Algebra / Summer Term, Semester 1, Semester 2 / 12.50 MAST10008 Accelerated Mathematics 1 / Semester 1 / 12.50 And ONE OF the following subjects: **Subject** / **Study Period Commencement:** / **Credit Points:** ENGR10003 Engineering Systems Design 2 / Summer Term, Semester 2 / 12.50 ENVS10002 Reshaping Environments / Semester 1, Semester 2 / 12.50 GEOM20013 Applications of GIS / Semester 1 / 12.50 **Postgraduate students:** Admission to the MC-ENG Master of 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 Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Objectives, 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 the Disability Liaison Unit: http://www.services.unimelb.edu.au/disability/
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Subject Overview:	**AIMS** This subject will focus on how risk analysis and management principles and techniques can be applied to engineering projects. The subject introduces a range of risk analysis techniques, which are put in the context of engineering projects and analysed using the framework of the risk standard (AS/NZS ISO 31000:2009). Risk is a fundamental concept that is applied to every engineering project, whether it is ascertaining the risk of health impacts of water treatment processes, prevention of loss of life by flood mitigation projects, or catastrophic losses caused by the failure of structure in earthquakes or storms. The subject is of particular relevance to students wishing to establish a career in Engineering management, but is also of relevance to a range of engineering design disciplines where design for the total life cycle of the product or infrastructure should be considered. **INDICATIVE CONTENT** Topics covered include: an introduction to the history of engineering failures; the forms of risk and risk identification; project risk analysis; the sociological implications of acceptable risk; approaches to risk management, monitoring for compliance, risk perception and design implications.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** On completion of this subject the student is expected to: 1. Identify information sources and risks for engineering projects 2. Identify and develop a plan for managing risks and opportunities 3. Use statistical methods to analyse empirical data and develop a risk based simulation model. Undertake a sensitivity analysis to identify critical variables that have the potential for threatening the success of a project 4. Use simulation and Engineering Reliability techniques to predict the occurrence of failures of engineering projects 5. Implement a risk management framework based on AS/NZS/ISO 31000: 2009 including the context establishment, risk identification, risk analysis, risk evaluation, risk treatment 6. Identify and classify risk in terms of their severity and likelihood 7. Use tools to diagrams to assist in identifying and representing risks 8. Define a range of performance metrics for an engineering system.
Assessment:	One 2 hour closed book end of semester examination (60%). Intended Learning Outcome (ILO) 3, 4 and 5 are addressed in the exam Assignments totaling 3000 words, requiring approximately 30 hours of work per student, due mid-semester and end of semester (30%). ILOs 1 to 8 are addressed in the assignments Attendance and contribution to discussion in tutorials, during semester (10%). ILOs 1 to 8 are addressed in the contribution in tutorials.
Prescribed Texts:	Vose, David Risk Analysis: A Quantitative Guide 3rd Edition, John Wiley & Sons Ltd 2008 Navidi, William Statistics for Engineers and Scientists 2nd Edition, McGraw-Hill 2007 M. Modarres, M. Kaminskiy, V. Krivtsov Reliability Engineering and Risk Analysis: A Practical Guide, 2 nd Edition, CRC Press, Taylor & Francis Group 2010
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2016/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2016/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2016/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2016/B-MUS)** You should visit **learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)** and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.
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 # Understanding of social, cultural, global, and environmental responsibilities and the need to employ principles of sustainable development # Ability to utilise a systems approach to complex problems and to design and operational performance

	# Ability to function effectively as an individual and in multidisciplinary and multicultural teams, as a team leader or manager as well as an effective team member # Ability to communicate effectively, with the engineering team and with the community at large.
Notes:	**LEARNING AND TEACHING METHODS** Learning and teaching methods include lectures with the involvement of experienced industry professionals who present case studies in their area of expertise, computer laboratory based tutorials and consultation sessions. **INDICATIVE KEY LEARNING RESOURCES** Prescribed texts AS/NZS/ISO 31000: 2009 Risk Management Standard. Engineers Australia Risk Management Strategies Guide **http://www.engineersaustralia.org.au/membership/risk-management-strategies-guide (http://www.engineersaustralia.org.au/membership/risk-management-strategies-guide)** **CAREERS / INDUSTRY LINKS** This subject uses examples from professional practice to illustrate the assessment items.
Related Majors/Minors/ Specialisations:	B-ENG Civil Engineering stream Civil (Engineering) Systems major Civil Systems Engineering Systems Environmental Engineering Systems major Environments Discipline subjects Geomatics (Geomatic Engineering) major Master of Engineering (Civil) Master of Engineering (Environmental) Master of Engineering (Spatial) Master of Engineering (Structural) Science-credited subjects - new generation B-SCI and B-ENG. Selective subjects for B-BMED Spatial Systems Spatial Systems