SWEN90010 High Integrity Systems Engineering

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 hours, comprising of two one-hour lectures and one 1-hour workshop per week Total Time Commitment: 200 hours
Prerequisites:	

Subject	Study Period Commencement:	Credit Points:
SWEN90006 Software Testing and Reliability	Semester 2	12.50

Corequisites:	None
Recommended Background Knowledge:	

Subject	Study Period Commencement:	Credit Points:
SWEN40004 Modelling Complex Software Systems	Semester 1	12.50

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:	Dr Timothy Miller
Contact:	email: **tmiller@unimelb.edu.au (mailto:tmiller@unimelb.edu.au)**
Subject Overview:	**AIMS** High integrity systems are systems that must be engineered to a high level of dependability, that is, a high level of safety, security, reliability and performance. In this subject students will explore the aims, principles, techniques and tools that are used to analyse, design and implement dependable systems. **INDICATIVE CONTENT** Topics include: an introduction to high-integrity systems; safety critical systems and safety engineering; mathematical modelling of systems; fault tolerant systems design; design by contract; static verification; and model-based testing.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)**

	On completion of this subject the student is expected to: 1 Classify the characteristics of a dependable system and identify these characteristics in domains 2 Apply advanced verification methods to the validation and measurement of system properties 3 Apply a range of techniques to the analysis, design and validation of high integrity systems
Assessment:	500 words each and requiring approximately 65 - 70 hours of work each (50%). These assignments will be executed in pairs, and are due in weeks 3, 6, 10, and 12 respectively. ILOs 2 and 3 are addressed by the assignments A two-hour end-of-semester examination (50%). ILOS 1-3 are addressed by the end-of-semester written exam. Hurdle requirement: To pass the subject, students must obtain: At least 50% overall; At least 50% (25/50) in project work; and At least 50% (25/50) in the written examination. Intended Learning Outcomes (ILOs) 2 and 3 are addressed by the three assignments and the pair project. ILOs 1-3 are addressed by the end-of-semester written exam.
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 should have the following 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 Proficiency in engineering design # Ability to manage information and documentation # Capacity for creativity and innovation # Understanding of professional and ethical responsibilities, and a commitment to them.
Notes:	**LEARNING AND TEACHING METHODS** The subject will be delivered through a combination of lectures and hands-on workshops. Students will also complete three individual assignments and a pair-based project, which will reinforce the material covered in lectures. **INDICATIVE KEY LEARNING RESOURCES** A book of notes will be made available at the University of Melbourne bookshop at the start of the semester. In addition, handouts of seminal research papers and book chapters about major topics will be distributed to students. **CAREERS / INDUSTRY LINKS** The methods and principles in this subject are central to many safety-, mission-, and life-critical systems deployed today, such as transport control systems, automated manufacturing, and healthcare devices. Topics covered were chosen to reflect those methods and principles currently used in high-integrity systems engineering, and were informed by several industry experts from domains such as railway signalling and air-traffic management. Case studies used as part of the learning are real examples of critical systems from industry in which failure to operate dependably has resulted in serious injury, death, or severe damage. Two lectures will be presented from industry-based lecturers who will describe the methods and principles used for analysis of safety-critical systems.
Related Course(s):	Master of Philosophy - Engineering Ph.D.- Engineering
Related Majors/Minors/ Specialisations:	B-ENG Software Engineering stream Master of Engineering (Software with Business) Master of Engineering (Software)