421-440 Steel & Concrete Design

Credit Points:	12.50
Level:	4 (Undergraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: 18 hours lectures, 5 tutorials, 1 video lab and 24 hours of formal design classes Total Time Commitment: Not available
Prerequisites:	421-307 Structural Engineering 1 421-317 Structural Engineering 2
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:	Assoc Prof Emad Gad
Contact:	Dr Emad Gad Department of Civil and Environmental Engineering Email: e.gad@unimelb.edu.au
Subject Overview:	This subject integrates structural theory and design. Topics covered include theory behind brittle fracture and fatigue of steel structure; design of steel connections; idealised frame method of slab design; flat plates and slabs; punching shear; partially pre-stressed beams and slabs; procedures and processes involved in the design of steel and concrete structures. Two group design projects will allow students to practice their design skills.
Objectives:	At the completion of this subject students should be able to: # Describe the factors which cause steel to fail in brittle fracture. # Assess the fatigue performance of simple steel structures. # Describe the behaviour of partially prestressed concrete beams, and analyse and design these structures. # Design concrete systems including one-way slabs, slabs supported on all 4 sides by beams or walls, flat plates and slabs. # Work effectively in small groups in a manner similar to that adopted in a design office to design substantial steel and concrete structures.
Assessment:	One group assignment (2,000 words per student equivalent) in the first half of semester (30%), and one group assignment (1,000 words per student equivalent) in the second half of semester (15%), one lab assignment (5%), one 3-hour exam (end of semester, 50%). Passing of the exam is a hurdle requirement of the subject. Team cooperation and contributions will be taken into account in awarding individual marks for team outcomes.
Prescribed Texts:	“Steel Structures Design Handbook HB48”, Standards Australia, 1999“Handbook 2.2Australian Standards for Civil Engineering Students – Part 2: Structural Design”, Standards Australia, 2003

Recommended Texts:	“Steel Designers Handbook “, Gorenc, B., Tinyou, R., and Syam, A., UNSW Press, 2005 “Concrete Structures”, Warner, R.F., Rangan, B.V., Hall, A.S., Faulkes, K. Longman, 1998, 1st Edition “Design and Analysis of Concrete Structures”, Fairhurst, L., McGraw-Hill Book Co., 1990 “Concrete Technology”, Neville, A.M. and Brooks, J.J., Longman, Revised reprint 1990 “Handbook for Reinforced Concrete Design”, C&CA (T38) & Standards Australia (HB71-2002)
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:	# knowledge of 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 complex problems and to design and operational performance # proficiency in engineering design # ability to manage information and documentation # capacity for creativity and innovation
Notes:	Special computer requirements: Spacegass software
Related Course(s):	Bachelor of Engineering (Civil Engineering) Bachelor of Engineering (Civil) and Bachelor of Arts Bachelor of Engineering (Civil) and Bachelor of Commerce Bachelor of Engineering (Civil) and Bachelor of Laws Bachelor of Engineering (Civil) and Bachelor of Science Bachelor of Engineering (EngineeringManagement) Civil