

421-632 Design in Steel & Other Materials

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus.
Time Commitment:	Contact Hours: Thirty-six hours. Total Time Commitment: Estimated total time commitment of 120 hours.
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	<p><p>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.</p> <p>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</p></p>
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Subject Overview:	The major objective of this unit is to develop an understanding of the procedures and processes involved in the design of structures made of structural steel, cold-formed steel, composites, timber or masonry, and be able to produce effective and economical design solutions through correct integration of these materials.
Objectives:	<p>Students should be able to:</p> <ul style="list-style-type: none"> # Develop simplified conceptual designs of steel structures to satisfy a design brief. # Calculate gravity, operational and environmental loads acting on a structural system. # Analyse complex structures using approximate hand calculations and detailed computer analyses to obtain member actions and structural deflections. # Design steel members and their connections using relevant design standards. # Identify mechanisms of brittle failure and methods to avoid such failure. # Analyse and assess the fatigue performance of structural steel components. # Appreciate the structural and material behaviour of cold formed steel products. # Check for local buckling of cold formed steel members. # Design tension and compression in cold formed steel members. # Design to account for the diverse connection types available for cold formed steel products. # Design a simply-supported composite beam in accordance with current codes and practices. # Design to account for factors affecting the fire-resistance of steel-concrete composite section.

	<ul style="list-style-type: none"> # Design timber elements to resist tension, bending and compression with due considerations given to its strength and material properties. # Design to account for the common types of timber connections used in industry. # Describe the strength properties of masonry construction and the parameters affecting compressive, tensile, bending and shear strengths. # Identify the load paths in masonry structure and calculate the different actions imposed on individual walls from dead, live and environmental loads. # Design masonry walls with different boundary conditions to resist compressive forces, shear forces, out-of-plane bending, and in-plane bending moments using relevant design standards. # Work effectively in small design groups. # Prepare a design report of a complex structure which is made up of structural steel or other materials that have been covered in the subject.
Assessment:	One 3-hour written exam (60%) and two written assignments. The first assignment is 3000 words and is worth 30%. The second assignment is 1000 words and is worth 10%. Students must pass the examination and assignments to pass the subject.
Prescribed Texts:	"Steel Structures Design Handbook HB48", Standards Australia, 1999 "Handbook 2.2 Australian 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
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 of this subject, students should have: <ul style="list-style-type: none"> # Highly developed analytical and problem solving skills. # Sound working skills in the application of computer skills. # Highly developed teamwork skills. # Extensive knowledge of a particular multi disciplinary area.
Related Course(s):	Master of Engineering Structures