421-613 Advanced Concrete Design and Technology

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: 36 hours; Non-contact time commitment: 120 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:	Dr Tuan Duc Ngo
Contact:	Dr Tuan Ngo Department of Civil and Environmental Engineering, Tel: +61 3 83447950 Email: t.ngo@civenv.unimelb.edu.au
Subject Overview:	This subject introduces to the students the fundamental concepts of design and analysis of prestressed concrete structures with applications to both buildings and bridges. There will also be detailed coverage of the design and construction of concrete highway bridges and the effective use of the strut-and-tie model. This subject will also cover state-of-the-art concrete technologies including high strength/high performance concrete, mix design for normal and high strength concrete, applications of precast concrete, durability of concrete structures.
Objectives:	On successful completion, students should have: # describe the behaviour of partially prestressed concrete beams, and analyse and design these structures with particular reference to: properties of prestressing steel and types of prestressing systems; sectional behaviour at service load level, equivalent load concept and load balancing; creep and shrinkage in concrete; estimation of prestress losses, deflection and amount of cracking; indeterminate structures; anchorages; applications to building and bridge construction; # describe different methods of constructing concrete bridges and key features of the prestressed concrete design. Identify particular economical merits of each method associated with different site constraints; # use of strut and tie design methodology to design non-flexural members such as deep beams and corbels; # describe the technology related to high strength concrete and its applications to contemporary buildings and other infrastructure, and demonstrate the awareness of the important factors affecting its performance in practical applications; # design mixes for normal and high strength concrete; # describe the use of precast concrete, its advantages and aspects related to its design applications;

	# identify the key issues related to the durability of concrete structures.
Assessment:	One written assignment on each of concrete technology, prestressed concrete and bridge engineering, each one of approximately 1,000 to 2,000 word-equivalents (total of 30% for the 3 assignments).
Prescribed Texts:	None
Recommended Texts:	Warner, R.F., Rangan, B.V., Hall, A.S. and Faulkes, K.A., “Concrete Structures” Longman, 1998.
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
Notes:	This subject replaces: 421-613 Advanced Concrete Design and Technology
Related Course(s):	Master of Engineering Structures