CVEN90017 Earthquake Resistant Design of Buildings

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2012, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 48 hours (Lectures: 3 hours per week) Total Time Commitment: 120 hours
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	Knowledge gained in the following subject will assist learning

Subject	Study Period Commencement:	Credit Points:
CVEN90026 Extreme Loading of Structures	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:	Assoc Prof Helen Goldsworthy
Contact:	Dr. Helen Goldsworthy **helenmg@unimelb.edu.au (mailto:helenmg@unimelb.edu.au)**
Subject Overview:	This subject introduces the fundamental concepts and practice of earthquake resistant design of buildings from an international perspective. Topics covered include plate tectonics and seismicity, structural response to earthquake ground motions, design philosophy and design applications to buildings including domestic buildings, assessment and retrofitting of existing buildings, and performance of non-structural components and building contents. One part of the subject is devoted to the design and assessment issues in regions of low and moderate seismic activity
Objectives:	On completion of this subject students should be able to: # Describe seismicity of the world and the role of plate tectonics # Accurately interpret response spectra presented in the different formats including the Acceleration-Displacement Response Spectrum (ADRS) diagram for quantifying potential seismic hazards on infrastructure # Accurately interpret performance limit states # Undertake seismic design and assessment of building structures using both the force-based methods and displacement-based methods including the Capacity Response Spectrum Method and the Substitute-Structure Method # Employ capacity design principles and the concept of strength hierarchies to ensure that the structure responds to an earthquake in the desirable way. Apply this concept to the design of a range of structural systems for buildings including moment resisting frames of reinforced concrete, steel and composite construction, reinforced concrete structural walls, and concentric or eccentrically braced steel frames

	# Select and apply the appropriate energy dissipation or base-isolation device for mitigating seismically induced damage to a building # Predict damage to un-reinforced masonry buildings and identify the vulnerable features # Assess existing building structures and provide plans for their effective retrofitting # Assess seismic performance of vulnerable buildings and components in regions of low and moderate seismicity taking into account the effects of soil resonance and identify effective means of retrofitting # Assess seismic performance of non-structural components and building contents and identify effective measures to mitigate potential damage
Assessment:	One 3-hour examination, end of semester (70%)One assignment (1500 words) due week 5 (20%)One assignment (1000 words) due end of semester (10%)
Prescribed Texts:	None
Recommended Texts:	Displacement-based Seismic Design of Structures (M.J.N. Priestley, G.M. Calvi & M.J Kowalsky), IUSS Press, 2007
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:	# 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 # Capacity for creativity and innovation # Understanding of professional and ethical responsibilities, and commitment to them # Capacity for lifelong learning and professional development
Related Course(s):	Bachelor of Engineering (Civil Engineering) Master of Engineering Structures Master of Engineering Structures Postgraduate Certificate in Engineering
Related Majors/Minors/ Specialisations:	Master of Engineering (Civil) Master of Engineering (Structural)