CVEN90044 Engineering Site Characterisation

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 45 hours (Lectures: 36 hours per semester; Tutorials/Lab testing/Computer Labs: 9 hours per semester) and Field Practicals Total Time Commitment: 200 hours
Prerequisites:	<table><tr><th>Subject</th><th>Study Period Commencement:</th><th>Credit Points:</th></tr><tr><td>ENEN20002 Earth Processes for Engineering</td><td>Semester 2</td><td>12.50</td></tr></table> Or equivalent
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 Mahdi Miri Disfani
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Subject Overview:	**AIMS** Characterisation of sites is an important step in any engineering study or design. In order to devise a design for an engineering project a range of contextual factors need to be determined. These include intrinsic aspects of natural and anthropogenic history, such as geological context and former industrial use as well as it indigenous heritage. Extrinsic impacts on the site such as the risk of flood, fire, and earthquake also need to be well understood. Finally the relationship with the surrounding natural and social environment needs to be characterised to ensure cross boundary effects of the project implementation of post-commissioning use do not cause unpredicted adverse impacts. This subject will examine typical technical tools for characterising a site for infrastructure development, covering a range of the above aspects that are relevant to the site and development. In doing so students will learn the skills and an approach to conduct site assessments, including the ability to select the appropriate geo-environmental tools for site investigations. This subject is part of a trio of subjects that consider different aspects of infrastructure projects; Engineering Site Characterisation studies how to determine the character of a site for a infrastructure project, Sustainable Infrastructure Engineering examines how the project relates to the broader social, political, economic and environmental context, while Engineering Project

	Implementation concentrates on the operational aspects of implementing a project. Together they form the basis of further professional infrastructure engineering subjects. Students who have completed this subject will have valuable skills to gain engineering work experience. **INDICATIVE CONTENT** Geotechnical site investigations, noise evaluation and mitigation, natural disaster characterisation (fire, wind, earthquakes), introduction to surveying and levelling, in situ testing (soil), geophysical testing and fieldwork, and exposure to laboratory testing (soil, permeability).
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** On completion of this subject the student is expected to: 1 Conduct a simple topographic survey of a site 2 Evaluate the soil and geology of the site as it impacts the intended development 3 Evaluate the relationships of a site and its intended changes with its neighbours 4 Select the appropriate geo-environmental technical tools for site investigations 5 Estimate critical design parameters 6 Identify, assess and document the risk arising from natural disasters 7 Examine planning requirements 8 Write a report to communicate key aspects of the character of a site as it affects the design of changes to the site.
Assessment:	Three group reports (25%) approximately 1000 words each, due throughout the semester, requiring approximately 30 – 35 hours of work in total. Intended Learning Outcomes (ILOs) 1, 2, 4, 6, and 8 are addressed in these reports Four on-line assignments (20%) approximately 1500 words in total, requiring approximately 25-30 hours of work in total, due throughout the semester. ILOs 4, 5, and 6 are addressed in these assignments One individual report (5%) approximately 500 words, requiring approximately 5-7 hours of work, due week 3. ILOs 2 and 7 are addressed in this report One 2 hour open book examination (50%) at the end of semester. ILOs 1 to 8 are addressed in the examination Hurdle requirements: Students must attend all 3 field activities. Students must pass the examination to pass the subject.
Prescribed Texts:	Mayne, P.W.; Christopher, B.R., and DeJong, J.T. 2002, Manual on Subsurface Investigations FHWA Publication No. FHWA NHI-01-031, 294 pp. (available on LMS)
Recommended Texts:	# Clayton, C.R.I.; Matthews, M.C., and Simons, N.E. 1995 Site investigation Oxford [England] ; Cambridge, Mass., USA : Blackwell Science, vii, 584 pp (available on LMS) Guide to the investigation and sampling of sites with potentially contaminated soil Australian Standard AS 4482.1 – 2005 (available from UoM library) # Australian Standard AS 1726 – 1993, Geotechnical site investigations (available from UoM library) # Australian Standard AS 1289.6.3.2 – 1997, Methods of testing soils for engineering purposes; Method 6.3.2: Soil strength and consolidation tests—Determination of the penetration resistance of a soil—9 kg dynamic cone penetrometer test (available from UoM library) # Australian/New Zealand Standard AS/NZS 1170.2 – 2002, Structural Design Actions: Part 2 – Wind Actions.
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 # Understanding of social, cultural, global, and environmental responsibilities and the need to employ principles of sustainable development # Ability to utilise a systems approach to complex problems and to design and operational performance # Ability to communicate effectively, with the engineering team and with the community at large # Ability to manage information and documentation # Ability to function effectively as an individual and in multidisciplinary and multicultural teams, as a team leader or manager as well as an effective team member # Capacity for lifelong learning and professional development.
Notes:	**LEARNING AND TEACHING METHODS**

	The subject is based principally on a mix of lectures, tutorials, fieldwork and laboratory demonstrations. In addition, experienced industry professionals present one or two case studies in their area of expertise and play important roles in some of the fieldworks. Computer laboratories, both guided and self-guided are used to learn dealing with maps (in ArcGIS), engineering site information, noise modelling (in Matlab) and decision making through problem-based learning. A site visit to a geological, environmental and socio-cultural rich location, such as the Stanley and Yarra Bend Parks, exposes students to teamwork and mandatory site visit for site investigations. Demonstration of common laboratory testing completes the variety of learning and teaching methods employed in the subject. Continuous assessment and feedback through almost weekly activities help students to assimilate the varied subject contents. **INDICATIVE KEY LEARNING RESOURCES** Prescribed book: Mayne, P.W.; Christopher, B.R., and DeJong, J.T. 2002, Manual on Subsurface Investigations FHWA Publication No. FHWA NHI-01-031, 294 pp. (available on LMS). In addition, supplementary information can be resourced from other textbooks, standards, class notes, including: • Clayton, C.R.I.; Matthews, M.C., and Simons, N.E. 1995 Site investigation Oxford [England] ; Cambridge, Mass., USA : Blackwell Science, vii, 584 pp (available on LMS) • Guide to the investigation and sampling of sites with potentially contaminated soil Australian Standard AS 4482.1 – 2005 (available from UoM library) • Geotechnical site investigations Australian Standard AS 1726 – 1993 (available from UoM library) • Methods of testing soils for engineering purposes; Method 6.3.2: Soil strength and consolidation tests—Determination of the penetration resistance of a soil—9 kg dynamic cone penetrometer test Australian Standard AS 1289.6.3.2 – 1997 (available from UoM library) **CAREERS / INDUSTRY LINKS** Experienced industry professionals present one or two case studies in their area of expertise during lectures and play important roles in the conception and delivery of one the fieldworks (boring log and dynamic cone penetrometer testing), exposing students to real-life situations and work experience from both senior and junior industry staff.
Related Course(s):	Doctor of Philosophy - Engineering Master of Architectural Engineering Master of Philosophy - Engineering
Related Majors/Minors/ Specialisations:	B-ENG Civil Engineering stream Master of Engineering (Civil with Business) Master of Engineering (Civil) Master of Engineering (Environmental) Master of Engineering (Structural)