CVEN90043 Sustainable Infrastructure Engineering

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: 48 hours (Lectures: 2 hours per week; Workshops: 2 hours per week) Total Time Commitment: 200 hours
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	Staff recommend that all students access the Academic Skills Unit (ASU) courses. In particular, a critical thinking, reading, and writing seminar will assist the student with the assessment of this subject. Sessions with the ASU can be booked at the following site: **http://services.unimelb.edu.au/academicskills (http://services.unimelb.edu.au/academicskills)**
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:	Prof Anne Steinemann
Contact:	Prof Anne Steinemann **anne.steinemann@unimelb.edu.au (mailto:anne.steinemann@unimelb.edu.au)**
Subject Overview:	This subject provides an overview of a wide range of issues relating to infrastructure, with a particular focus on the environmental, economic, and social sustainability of historical and current projects. Students will gain an understanding of the complexities of decision-making in this sector, including the role of government and regulation, considerations of equity, and assessment of economic and environmental impacts. Students will discuss the influential role that infrastructure plays in shaping a society, and the effects both short-term and long-term. Students will also learn to apply various analytical models to frame their thinking and evaluate infrastructure projects from a sustainability perspective. The lectures and tutorials will be structured around case studies of various infrastructure projects. Tutorials will cover six case studies and will provide students with opportunities to enhance skills such as oral and written communication and project management. Students are expected to actively contribute to case study discussions in tutorials. 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 an infrastructure project. Sustainable Infrastructure Engineering examines how a project relates to the broader social, economic, and environmental context. Engineering Project Implementation concentrates on the operational aspects of implementing a project.
Learning Outcomes:	Having completed this subject the student is expected to:

	1 Demonstrate mastery of advanced knowledge and skills to evaluate an infrastructure project with regard to its environmental, economic, and societal sustainability 2 Apply and critically interpret a range of analytic tools to assess different dimensions of the sustainability of infrastructure 3 Synthesise complex information and concepts to explain the relationships between infrastructure and its broader societal context, including public policy, governance, ethics, equity, and stakeholder interests 4 Perform written and oral presentations at a high quality level expected of a professional
Assessment:	One 2 hour examination, at end of semester (35%, hurdle requirement); 6 Executive Sumamaries reviewing case studies, due throughout semester (25%, hurdle requirement); Active discussion in tutorial sessions, throughout semester (10%, hurdle requirement); One 20 minute group presentation (requiring approximately 13-15 hours of work per student), due mid semester (10%); One major group assignment report (1000 words per student, requiring approximately 25-30 hours of work per student), due end of semester (20%). Students must pass all hurdle requirements to pass the subject.
Prescribed Texts:	None
Recommended Texts:	ADC Forum (2010) *ADC Cities Report; Enhancing Liveability*, Editors Roux A, and Stanley J., ADC Forum, PO Box 18058, Collins Street East, Victoria, Australia. Ashford, N.a., and Hall, R.P. (2011) *Technology, Globalisation, and Sustainable Development*: Transforming the Industrial State, New Haven and London: Yale University Press. Benyus, J. (20002). *Biomimicry*. New York: Harper Perennial. Brundtland, G. (1987). Our Common Future Call for Action. *Environ. Conserv*. 14(04), p. 291. Checkland, P. (2002). *Systems thinking, systems practice.* Chichester: Wiley. Daly, H.E., Cobb, J.B., and Cobb, C.W. (1994) *For the commond good: Redirecting the economy toward community, the environment, and a sustainable future*. Boston:Beacon Press. Hawken, P. (2010). *The Ecology of Commerce: A Declaration of Sustainability*. New York: Harper Business. Hawken, P., Lovins, A. and Lovins, L. (1999). *Natural Capitalism.* Boston: Little, Brown and Co. Learn about Sustainability through animations, (2015). *Learn about Sustainability through animations*. (Online) Available at: **http://www.thesecretlifeofthings.com/ (http://www.thesecretlifeofthings.com/%20)** (Accessed 18 Aug. 2015). Meadows, D., Randers, J. and Meadows, D. (2004). *The limits to growth*. White River Junction, Vt: Chelsea Green Pub. Co. Moore, M. (1995). *Creating public value*. Cambridge, Mass.: Harvard University Press. Porritt, J. (2005). *Capitalism as if the world matters*. London: Earthscan. US HoR Transportation & Infrastructure Committee, (2015). *Public Private Partnerships*. Washington, DC. Wallis, J. and Dollery, B. (1999). *Market failure, government failure, leadership and public policy.* New York: St. Martin's Press. Williamson, I. (2010). *Land administration for sustainable development.* Redlands, Calif.: ESRI Press Academic.
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:	1 Understanding of environmental, societal, and economic dimensions of engineering and infrastructure projects 2 Understanding of the scope, principles, and accountabilities of sustainable engineering 3 Application of engineering methods and analytic techniques to complex engineering problems 4 Critical thinking and analytic skills 5 Effective oral and written communication skills 6 Effective team membership and independent learning skills 7 Understanding of professional and ethical responsibilities, and commitment to them
Notes:	**LEARNING AND TEACHING METHODS** The case study method of learning is used for this subject. Students work in classes of about 40 students to discuss a case study that they have previously researched in their groups. **INDICATIVE KEY LEARNING RESOURCES** Contemporary cases are given at the beginning of the semester **CAREERS / INDUSTRY LINKS**

	This subject uses contemporary engineering cases from around the world to explore the contextual issues that interrelate to engineering design.
Related Course(s):	Doctor of Philosophy - Engineering Master of Architectural Engineering Master of Engineering Management Master of Engineering Project Management Master of Engineering Structures Master of Environmental Engineering Master of Information Technology Master of Philosophy - Engineering
Related Majors/Minors/ Specialisations:	B-ENG Civil Engineering stream MIT Spatial Specialisation Master of Engineering (Civil with Business) Master of Engineering (Civil) Master of Engineering (Environmental) Master of Engineering (Structural)