ENEN20002 Earth Processes for Engineering

Credit Points:	12.5
Level:	2 (Undergraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 50 hours (Lectures: 36 hours per semester; Workshops: 12 hours per semester; Laboratory Session: 2 hours per semester) Total Time Commitment: 170 hours
Prerequisites:	Admission to the MC-ENG Master of Engineering OR ONE OF the following subjects:

Subject	Study Period Commencement:	Credit Points:
ENGR10003 Engineering Systems Design 2	Summer Term, Semester 2	12.50
ENVS10001 Natural Environments	Semester 1, Semester 2	12.50
ENVS10002 Reshaping Environments	Semester 1, Semester 2	12.50

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students cannot gain credit for this subject and: 421-209 Geomechanics 1
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 Graham A. Moore
Contact:	Adrian Fui Kiew Yong **adrian.yong@unimelb.edu.au (mailto:adrian.yong@unimelb.edu.au)**
Subject Overview:	**AIMS** In this subject students will be introduced to physical earth processes and their engineering applications and implications. In particular, the subject concentrates on engineering aspects of climate, water and soils and their interactions. Simplified modelling and relevant analytical techniques are introduced throughout the subject. The students will learn about fundamental material required for later year subjects such as CVEN30010 System Modelling and Design, CVEN90044 Engineering Site Characterisation and CVEN90050 Geotechnical Engineering. **INDICATIVE CONTENT** Climate and seasonality; carbon cycle, global water cycle and catchment water cycle; rainfall, infiltration, runoff and evapotranspiration; catchment processes and stochastic rainfall

	modelling; soil identification; landscape forming processes; basic soil mechanics; earth engineering stability; revision.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** On completion of this subject the student is expected to: 1 Identify key aspects of the climate, soil and water environment that their course is directed towards 2 Describe and quantify aspects of the climate system, climate variability and climate change 3 Describe and analyse hydrological systems and the cycling and transformation of water and energy in those systems, including aspects of their variability, dependence on climate and land use and implications for soil water and runoff behaviour 4 Describe the key soil and landscape forming processes and their geomechanical implications 5 Describe the concept of sustainability and, given a project description, identify and justify analyses required to assess aspects of environmental sustainability in the context of climate, water and soils 6 Quantify various constituents of soil and classify them with hydrological and engineering implications 7 Understand how water and soil interact in natural hydrological systems and in engineering designs and quantify soil behaviour and stability caused by interaction of soil and water 8 Assess soil stability in both natural and engineering systems with the ability to predict stresses and strengths within a soil mass
Assessment:	One 2 hour end of semester examination (50%). Intended Learning Outcomes (ILOs) 1 to 8 are addressed in the examination Four written team-based assignments (10% each, 40% in total) each with 3 team members and each a minimum of 1000 words (maximum of 2000 words) requiring 10 to 12 hours of work per student. Due between week 5 and week 12. ILOs 2, 3, 7 and 8 are addressed in these assignments Attendance and participation in one laboratory class with a written assignment of a minimum of 1000 words (maximum of 2000 words) (10%) requiring 10 to 12 hours of work including preparation. Due between week 8 to week 11. ILOs 5 and 6 are addressed in this assessment Hurdle Requirement: Students must pass both assignment and examination components to pass the subjectNote: Students are required to participate in a peer assessment process to allow the coordinator to allocate individual marks for the group assignments.
Prescribed Texts:	None
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2016/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2016/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2016/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2016/B-MUS)** You should visit **learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)** and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	# Ability to apply knowledge of basic science and engineering fundamentals # Ability to undertake problem identification, formulation and solution # Critical thinking and judgement # Ability to communicate effectively # Understanding environmental responsibilities and the need for sustainable development # Ability to function effectively as an individual with the capacity to be an effective team member
Notes:	**LEARNING AND TEACHING METHODS** The delivery of this subject is based on lectures which are fully integrated with weekly workshops and a series of assignments allocated throughout the semester. Problem-based learning is a key feature aiming to enrich students' appreciation of the subject contents and

	their engineering relevance and practical applications. A hands-on exercise is conducted in a laboratory environment to quantify various constituents of soil and classify them with hydrological and engineering implications. The subject also allows students to develop their teamwork skills by collaborating on group assignments. **INDICATIVE KEY LEARNING RESOURCES** This subject does not require students to purchase any particular prescribed textbooks but learning material is provided online via a series of relevant web links and downloadable documents, including an online text. **CAREERS / INDUSTRY LINKS** Practical context and industry links are provided in the problem-based learning exercises. Note: This subject is available for science credit to students enrolled in the Bachelor of Science
Related Course(s):	Master of Architectural Engineering
Related Majors/Minors/ Specialisations:	B-ENG Civil Engineering stream Civil (Engineering) Systems major Engineering Systems Environmental Engineering Systems major Environments Discipline subjects Master of Engineering (Civil with Business) Master of Engineering (Civil) Master of Engineering (Environmental) Master of Engineering (Structural) Science-credited subjects - new generation B-SCI and B-ENG. Selective subjects for B-BMED
Related Breadth Track(s):	Engineering and Environments