

Soil Mechanics and Engineering Geology

Module Code	CIVE50007	FHEQ Level	Level 5
Pre-requisites	N/A	Co-requisites	N/A
Teaching Term	Autumn, Spring and Summer	Available for CPD (MSc only)	No
Primary Department	Civil & Environmental Engineering		
Module Leader	Standing, Jamie		
Additional Teaching Departments	N/A		
Teaching Staff	Standing, Jamie; Lawrence, James; Zdrakovic, Lidija		
Programmes on which the Module is delivered			Core/Elective
MEng Civil Engineering (H201)			Core
MEng Civil Engineering with a Year Abroad (H202)			Core
Civil Engineering (H21E)			Core
Module Overview	In this module you will gain a broad understanding of the main fundamental elements of soil mechanics and rock engineering and the behaviour of soils and rocks needed for engineering design, and an understanding of their geological histories and the geological hazards associated with them. You will also learn the fundamentals of geotechnical analysis used in the design of geotechnical structures.		
Learning Outcomes	<p>Upon successful completion of this module, you will be able to:</p> <ul style="list-style-type: none"> • predict flow rates and pore pressures for simple seepage conditions; determine consolidation characteristics, including permeability from laboratory test data; derive appropriate design parameters for soil strength and compressibility; • decide whether design problems involve drained or undrained loading; analyse simple geotechnical stability problems for design; • design a basic geotechnical site investigation that accounts appropriately for the geological context; • identify and map a number of geological structures and understand the geological hazards associated with them. 		
Description of Content	You will cover the following aspects which will develop your overall understanding of soil mechanics and engineering geology and prepare you for the third year module CI3 350 which covers the primary elements of geotechnical engineering analysis and design.		

Principle of effective stress. Seepage and flow nets. Seepage laboratories (model dam and permeameter). Consolidation of fine-grained soils. Soil strength and behaviour during shearing. Laboratory apparatus (oedometer, shear box, and triaxial apparatus). Mohr's circles and stress paths. Fundamentals of geotechnical analysis. Application of classical analysis methods in design. Walton's Wood slope stability analysis exercise. Geotechnical aspects of ground investigation. Introduction to rock engineering. Engineering geology of ground profiles. Geological structures. Geology field course.			
Assessment			
Assessment information will be provided separately.			
Learning & Teaching Hours	Independent Study Hours	Placement Hours	Total Hours
40	160	0	160
ECTS Credit	10	CATS Credit	20
Date of introduction	01/10/2020	Date of Last Revision	07/09/2020

Reading Lists:

Category as defined by Central Library:

C = Core, S = Supplementary

C	Lecture notes supplied by individual lecturers.
S	'Craig's Soil Mechanics' by JA Knappett and RF Craig (Spon Press - 9th Edition, 2020);
S	'The Mechanics of Soils and Foundations' by JH Atkinson (Taylor & Francis – 2 nd Edition, 2007)
S	'Foundations of Engineering Geology' by Tony Waltham (Spon Press – 3 rd Edition, 2009).
S	'Practical Rock Mechanics' by Steve Hencher (CRC Press – 1 st Edition, 2015)