

Module Details	
Module Title:	Soil Mechanics
Module Code:	CSE5009-B
Academic Year:	2019-20
Credit Rating:	20
School:	Department of Civil and Structural Engineering
Subject Area:	Civil and Structural Engineering
FHEQ Level:	FHEQ Level 5
Pre-requisites:	
Co-requisites:	

Contact Hours	
Type	Hours
Lectures	48
Tutorials	12
Laboratory	12
Directed Study	128

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Academic Year (Sept - May)

Module Aims
To be able to explain the behaviour of different soils, and the factors influencing their behaviour.

Outline Syllabus
Volume- mass relations, compaction of soils, Darcy`s law of permeability. Stresses in soil mass, definitions of effective stress, pore water pressure and total stress. Increase in effective stress due to external loading. Shear strength of soils. One-dimensional consolidation, drained and undrained soil behaviour, lateral earth pressure. Lab tests: permeability (falling head and constant head), oedometer test, shear box, triaxial test.

Learning Outcomes	
1	Evaluate soil behaviour in terms of its particulate nature.
2	Apply principles of continuum mechanics to soils.
3	Perform in a laboratory context under supervision; compaction, permeability, oedometer and shear strength tests
4	Present, interpret and analyse relevant laboratory data for the behaviour of soil.
5	Solve problems systematically

Learning, Teaching and Assessment Strategy
Concepts of soil behaviour alongside with several worked examples are introduced using formal lectures. The formal lectures are delivered using PowerPoint presentations. Students attempt to solve the worked examples prior to having a class discussion on how to solve systematically these questions. Deeper understanding is then developed during tutorial classes in which students practice the application of theories in geotechnical problems further enhanced using the laboratory classes and the geotechnical materials field course. The geotechnical materials field course takes place over a full day in the Yorkshire area, in which a number of locations are visited including two quarries, a sustainable park and a reservoir. The field course is a practical exercise, which includes identification of rocks, geological structures, geomorphology and applied geotechnics. The field trip requires a group approach to ensure that all students gain maximum benefit in the limited time available. In addition, the laboratory classes provide students with several opportunities to enhance their learning through observations and interpretation of relevant data. The laboratory classes will also enable linking theory with practice. Oral formative feedback is given during the laboratory sessions and tutorial classes. The formative examination will provide students with feedback in order to improve their learning and understanding of the fundamental aspects of soil mechanics. Directed time is for students to consolidate their learning through reading and practice of a range of practical problems from the recommended reading list. Technical report will assess the application of practical skills to the knowledge base of the module to illustrate the achievement of learning outcomes 3 and 4 whereas the formal examination will assess all other learning outcomes expressed in the descriptor. The supplementary assessment will include one compulsory question about the laboratory practicals.

Mode of Assessment				
Type	Method	Description	Length	Weighting
Referral	Examination - closed book	Supplementary with one compulsory laboratory based question	3 hours	100%
Summative	Examination - closed book	Examination - closed book	3 hours	70%
Summative	Coursework	A technical report on the laboratory obtained data and field course	-2000 words	20%

Formative	Classroom test	One Class Test	1 hour	%
Summative	Classroom test	One class test	1 hour	10%

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>.

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.