UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Soil Mechanics
Module Code	CSE5009-B
Academic Year	2022/3
Credits	20
School	Department of Civil and Structural Engineering
FHEQ Level	FHEQ Level 5

Contact Hours	
Type	Hours
Laboratories	12
Lectures	48
Directed Study	140

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Academic Year

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, Sieve analysis, 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	
Outcome Number	Description
01	Evaluate soil behaviour in terms of its particulate nature.
02	Apply principles of continuum mechanics to soils.
03	Perform in a laboratory context under supervision; compaction, permeability, oedometer and shear strength tests.
04	Present, interpret and analyse relevant laboratory data for the behaviour of soil.
05	Solve problems systematically.

Learning, Teaching and Assessment Strategy

Concepts of soil behaviour alongside with several worked examples are introduced using formal lectures. 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 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 if required will include one compulsory question about the laboratory practicals.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Classroom test	In-class closed book examination (1hr)	10%
Summative	Laboratory Report	Technical report on the laboratory-obtained data	20%
Summative	Examination - Closed Book	Formal closed book examination (2hrs)	70%
Formative	Examination - Closed Book	Closed book test (1hr) with feedback	N/A

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.

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