MODULE SPECIFICATION

Part 1: Information			
Module Title	Advanced Soil Mechanics		
Module Code	UBGMTA-15-M	Level	Level 7
For implementation from	2019-20		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Geography and Environmental Management
Department	FET Dept of Geography & Envrnmental Mgmt		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Overview: In this module, you will revise basic soil mechanics, focus on investigating deeper aspects of the soil behaviour and gain insight of parameters required to perform design of geotechnical structures, via (advanced) constitutive soil models.

Educational Aims: See Learning Outcomes

Outline Syllabus: In this module you will cover:

Revision of basic soil mechanics (e.g., permeability, compressibility and consolidation, Mohr-Coulomb failure criteria, basic understanding of laboratory soil testing via shear box and triaxial tests, drained and undrained conditions).

Constitutive models of soils, including the critical state cam clay model, to interpret and predict the complex behaviour of different soil types under various loading conditions.

Effective and total stress analyses for drained and undrained conditions, respectively.

Undrained shear strength of clays and drained shear strength of clays and sands (peak, residual).

Stiffness characteristics of soils (drained and undrained moduli, Young's modulus, shear modulus, bulk modulus, strain levels).

Elastic-plastic soil behaviour and failure criteria for soils.

Analysis and interpretation of (advanced) triaxial laboratory tests for obtaining design parameters.

Teaching and Learning Methods: See Assessment

Part 3: Assessment

Component A: Written Examination (2 hours). Learning outcomes 1 to 5.

A 2 hour written examination allows for the direct assessment of the students ability to apply the theory to technical and practical design problems. This part of the assessment is designed to offer students the opportunity to demonstrate their knowledge and understanding of advanced aspects of soil behaviour via constitutive models, appropriately select parameters for geotechnical design, and plan experimental testing for obtaining such parameters.

Component B: Portfolio (2000 words excluding appendices and references). Learning outcomes 2, 6, 7.

A coursework submission of a 2000 word portfolio, which demonstrates the application of soil mechanics and geotechnics theory to non-trivial problems: process advanced soil test data to obtain geotechnical design parameters.

Resit will involve retaking an examination and/or the resubmission of a reworked portfolio.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Portfolio - Component B		30 %	Portfolio (2000 words report) excluding appendices and references
Examination - Component A	✓	70 %	Examination (2 hours)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Portfolio - Component B		30 %	Portfolio (2000 words report) excluding appendices and references
Examination - Component A	✓	70 %	Examination (2 hours)

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	Reference
Interpret and predict soil behaviour under loading using theoretical models based on critical state soil mechanics	MO1
Identify the critical state parameters and how to obtain them from soil tests	MO2
Identify parameters which affect yielding and failure in soils	MO3
Evaluate stresses and strains of soils at failure	MO4
Evaluate stress states and stress paths	MO5
Select and plan soil testing, and interpret test data to obtain geotechnical parameters for the design of a spectrum of geotechnical structures such as earth retaining walls and foundations, showing how health and safety issues are addressed	MO6
Select and evaluate strength parameters to be used in geotechnical design taking into account a variety of soil types and loading conditions	MO7

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	114
Total Independent Study Hours:	114
Scheduled Learning and Teaching Hours:	
Face-to-face learning	36
Total Scheduled Learning and Teaching Hours:	36
Hours to be allocated	150
Allocated Hours	150

Reading List

The reading list for this module can be accessed via the following link:

https://uwe.rl.talis.com/modules/ubgmta-15-m.html

Part 5: Contributes Towards

This module contributes towards the following programmes of study: