

**Summary Information**

Module Code	5503CVQR
Formal Module Title	Geotechnics II
Owning School	Civil Engineering and Built Environment
Career	Undergraduate
Credits	10
Academic level	FHEQ Level 5
Grading Schema	40

**Teaching Responsibility**

LJMU Schools involved in Delivery
LJMU Partner Taught

**Partner Teaching Institution**

Institution Name
Oryx Universal College WLL

**Learning Methods**

Learning Method Type	Hours
Lecture	22
Practical	4
Tutorial	11

**Module Offering(s)**

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-PAR	PAR	January	12 Weeks

## Aims and Outcomes

Aims	To gain an advanced understanding of soil behaviour in shear, consolidation, induced and to apply this to the design of earth structures.
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After completing the module the student should be able to:

### Learning Outcomes

Code	Number	Description
MLO1	1	Identify and analyse geotechnical failure mechanisms.
MLO2	2	Evaluate the significance of water in soils, its movement and effects upon soil properties and strength parameters under drained or undrained conditions.
MLO3	3	Proficiently assess the stability earth retaining structures under effective stress conditions.

## Module Content

Outline Syllabus	Consolidation: determination of pre-consolidation pressure stress. Calculation of coefficient of compressibility $C_c$ and $m_v$ over a given stress interval. Interpretation of experimental data, and determination of time factor. Calculation of one-dimensional settlement of foundations on clay. Design of vertical drains and the effect of the time of construction. Soil behaviour in shear: Stress Element analysis, an introduction to continuum mechanics, soil as a frictional material, the Mohr-Coulomb model, Mohr – Coulomb failure criterion, effect of drainage conditions on shear strength, laboratory shear tests, the direct shear test, the triaxial test, types of triaxial test, unconfined compressive test, undrained strength. Induced stresses: due to shallow foundations, bearing capacity and limit analysis. Ultimate limit state design using EC7. Retaining structures: limiting lateral earth pressures, Rankine's theory of earth pressure, earth pressure at rest, gravity retaining structures, resultant thrust, Coulomb's theory of earth pressure, reinforced soil.
Module Overview	
Additional Information	The module develops knowledge and understanding of geotechnics, particularly with regard to long term conditions and the important influence of water on ground behaviour for civil engineering applications in analysis, design and construction. The module makes extensive use of mathematics and engineering principles, this is supported by lectures, case studies, tutorials and analytical exercises.

## Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Exam	Examination	100	1.5	MLO1, MLO2, MLO3

## Module Contacts

### Module Leader

Contact Name	Applies to all offerings	Offerings
Ed Loffill	Yes	N/A

**Partner Module Team**

Contact Name	Applies to all offerings	Offerings
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