

Liverpool John Moores University

Title: INTRODUCTION TO GEOTECHNICS
Status: Definitive
Code: **4204CIV** (122911)
Version Start Date: 01-08-2021

Owning School/Faculty: Civil Engineering and Built Environment
Teaching School/Faculty: Civil Engineering and Built Environment

Team	Leader
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Academic Level: FHEQ4
Credit Value: 20
Total Delivered Hours: 65
Total Learning Hours: 200
Private Study: 135

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	33
Practical	8
Tutorial	22

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	LABORATORY REPORT	30	
Exam	AS2	EXAMINATION	70	2

Aims

To gain an entry level understanding of soil and rock mechanics and soil interaction in engineering applications.

Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate their understanding of the physical and engineering characteristics of typically encountered soils and rocks.
- 2 Evaluate the significance of water in soils, its movement and effects upon soil properties and strength parameters.
- 3 Apply their understanding of the principles involved in assessing the stability of slopes to the design of foundations and earth retaining structures under total stress conditions.
- 4 Apply appropriate geotechnical understanding and analysis to soil loading and stress analysis problems.
- 5 Collect and process data from laboratory experiments and produce a formal written report with conclusions.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

LABORATORY REPORT	1	2	3	4	5
EXAMINATION	1	2	3	4	

Outline Syllabus

Site investigation, use of historical resources, legislative background, techniques, service avoidance, importance, health and safety.

Classification of soils to appropriate standards and the techniques to classify soils of different types effectively

Properties of soils, cohesive, granular how the properties differ.

Compaction of soils and the rationale behind it, compaction techniques, calculation of air-void content. Soil improvement in practice.

Geological structures, types, classification, weathering classifications, strengths and engineering properties of rock masses. Rock cycle.

Hydrological cycle, hydrostatic forces. Principles of total and effective stress analysis. Water flow in soils, flow nets, flow and pore pressure calculations.

Stress analysis calculations with different methods of stress increase examined.

Basic foundation principles and design, piling techniques, pad foundations, contact pressure.

Learning Activities

Lectures/Tutorials/Practicals.

Notes

The module provides an introduction through practical work to the composition, deposition and behaviour of engineering soil. The module makes extensive use of

mathematics and engineering principles, this is supported by lectures, case studies, tutorials and analytical exercises.