

Liverpool John Moores University

Title: GEOTECHNICS 2
Status: Definitive
Code: **5027BEUG** (102773)
Version Start Date: 01-08-2016

Owning School/Faculty: Civil Engineering
Teaching School/Faculty: Civil Engineering

Team	Leader
William Atherton	Y
Gary Lamb	

Academic Level: FHEQ5 **Credit Value:** 12 **Total Delivered Hours:** 50
Total Learning Hours: 120 **Private Study:** 70

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	24
Practical	12
Tutorial	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	unseen - 4 from 6 questions	70	2
Report	AS2	written reports	20	
Test	AS3		10	

Aims

To study the effects of standing and flowing groundwater on the deformation and failure of engineering earth structures and construction in isotropic homogeneous ground.

Learning Outcomes

After completing the module the student should be able to:

- 1 Explain and apply the principle of effective stress in geotechnics.
- 2 Interpret standing and flowing water conditions in engineering soil masses acting as a homogeneous isotropic permeable medium.
- 3 Relate the compression and shear failure of engineering soils to the conditions of test and field loading.
- 4 Analyse the stability and displacements for long-term loading of earth structures, earth retaining walls and foundations.
- 5 Analyse the stability of geotechnical designs.

Learning Outcomes of Assessments

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

EXAM	1	2	3	4
REPORT	2	3	5	
TEST	2	3		

Outline Syllabus

Ground water: Held water, equilibrium water content, soil suction, phreatic surface, permeability, seepage and flow nets, pore water pressure, stability and seepage forces.

Principles of Effective Stress: Compressibility and consolidation; influence of conditions on failure, stress paths, stress history and its effects.

Introduction to influence of: origins and history of soils on their behaviour.

CAD: The use of software packages in geotechnical design.

Retaining walls: Long-term lateral pressures from soil and ground water; stability and modes of failure; Coulomb wedge method.

Embankments and Cuttings: Long term stability of earth structures in submerged and partially-drained conditions; instrumentation and long-term changes.

Shallow Foundations: Pressure distribution; consolidation of soil layers; long-term and time-dependent settlement; effect of standing water on application of bearing capacity equations; pile design.

Learning Activities

Lectures, tutorials, practicals.

Notes

The module follows on from Geotechnics 1 (module BUEUG1022), this module emphasises and investigates the important influence of water on ground behaviour for civil engineering applications in analysis, design and construction over long term conditions. The module makes extensive use of mathematics and engineering principles, this is supported by lectures, case studies, tutorials and analytical exercises.