

## Liverpool John Moores University

Title: ADVANCED GEOTECHNICS AND DESIGN  
Status: Definitive  
Code: **6502CIVSL** (123432)  
Version Start Date: 01-08-2021

Owning School/Faculty: Civil Engineering and Built Environment  
Teaching School/Faculty: ICBT, Colombo

Team	Leader
Tina Marolt Cebasek	Y
Edward Loffill	

**Academic Level:** FHEQ6      **Credit Value:** 20      **Total Delivered Hours:** 51  
**Total Learning Hours:** 200      **Private Study:** 149

### Delivery Options

Course typically offered: S2 and Non Std S2 (S2 for Jan)

Component	Contact Hours
Lecture	33
Tutorial	16

**Grading Basis:** 40 %

### Assessment Details

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

### Aims

*To gain an advanced level of design skill in complex geotechnical applications.*

### Learning Outcomes

After completing the module the student should be able to:

- 1 Design geotechnical structures to current codes under advanced conditions.
- 2 Apply knowledge of advanced geomodels to design.
- 3 Apply knowledge of tunnelling in different soil and rock conditions
- 4 Apply the design process to complex structural elements using steel and masonry under a variety of environmental and loading conditions.
- 5 Demonstrate understanding of the interaction between superstructure and piling

### **Learning Outcomes of Assessments**

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

DESIGN REPORT	1	5			
EXAMINATION	1	2	3	4	5

### **Outline Syllabus**

*Geomodels in engineering geology, how different geological conditions can influence the strength of the rock mass in different ways and orientations. Full design to current codes including EC7 under advanced conditions including temporary work, rock structure design, retaining wall design, pile design and foundation design under different rock, water and soil conditions. Tunnelling methods in different soil conditions, NATM, current techniques in Alpine environments along with a range of world wide case studies. Comparison of EC7 techniques with other global standards.*

*Steelwork design to current codes including EC 3: laterally unrestrained beams, plate girders, composite columns  
Load bearing masonry design to current codes including EC 6: Solid and cavity walls, design principles and practical examples.*

### **Learning Activities**

Lectures and Tutorial sessions.

### **Notes**

This module develops the students' understanding of geotechnics and structural design, and integrates this knowledge in order that students can successfully produce designs including both superstructure and piling.