



## **Module Specification**

### **Structural Design and Soil Mechanics**

Version: 2023-24, v2.0, 25 Jul 2023

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## Part 1: Information

**Module title:** Structural Design and Soil Mechanics

**Module code:** UBGMJJD-30-2

**Level:** Level 5

**For implementation from:** 2023-24

**UWE credit rating:** 30

**ECTS credit rating:** 15

**Faculty:** Faculty of Environment & Technology

**Department:** FET Dept of Geography & Environmental Mgmt

**Partner institutions:** None

**Field:** Geography and Environmental Management

**Module type:** Module

**Pre-requisites:** None

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** Pre-requisites:

60 credits at Level 1 to include:

UFMFYG-15-1 Mathematics for Civil and Environmental Engineering

UBGLW9-15-1 Engineering Principles for Civil Engineering

UBGMXU-15-1 Engineering and Environmental Materials

**Features:** Module Entry Requirements: 60 credits at Level 1 to include pre-requisites.

**Educational aims:** This module aims to provide students with detailed procedures for designing structural elements. It uses standard codes of practice to design elements using different structural materials. The soil mechanics part provides a basis for interpreting ground conditions and analysing a range of problems related to both hard and soft solutions.

**Outline syllabus:** The syllabus includes:

Loading: permanent load, variable load, wind load, material densities and design loads.

Structural steel: material properties, basic beam design, laterally unrestrained beams, columns, basic welded and bolted joints, and composite sections using Eurocodes.

Reinforced concrete: material properties, bending design, shear design, flanged beams, slabs, columns, foundations, and detailing using Eurocodes.

Masonry: material properties, plain walls, concentrated loading, openings, basic lateral loading using Eurocodes.

Soil description, classification and properties.

Engineering behaviour of soil (pore pressure and effective stress, mechanics of soil, compaction, compression and consolidation).

Groundwater: water pressure and flow, permeability, seepage and flow nets.

Stresses in the ground: geostatic stresses, induced by loading and lateral earth pressures.

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** This module will be delivered through a number of lecture sessions aimed at establishing the discipline context, key definitions/concepts, and also at establishing a framework for learning. Through this mechanism learners build upon the fundamental concepts covered in the lectures and start applying new understanding through the tasks and activities in tutorials and laboratories. Formative feedback is provided to the group during contact sessions.

**Contact Hours:**

On average students will receive 3 hours of contact time per week. This will be in a range of formats, including lectures, tutorial or computer-based sessions, formative feedback sessions and support via e-mail.

The amount of time spent on activities in this module is shown below:

**Activity:**

Contact time (lectures/feedback/practical sessions and fieldwork): 76 hours

Assimilation and development of knowledge: 192 hours

Coursework preparation: 32 hours

Total study time: 300 hours

**Module Learning outcomes:** On successful completion of this module students will achieve the following learning outcomes.

**MO1** Select appropriate engineering properties for structural design in a range of materials

**MO2** Design basic structural steel elements and connections

**MO3** Design basic reinforced concrete elements

**MO4** Design masonry elements

**MO5** Demonstrate familiarity with the most common laboratory and in-situ soil tests

**MO6** Interpret geotechnical data to select appropriate parameters for analysis and design

**MO7** Identify the failure mechanisms associated with soils, including structural and ground water modes

**Hours to be allocated:** 300

**Contact hours:**

Independent study/self-guided study = 224 hours

Face-to-face learning = 76 hours

Total = 300

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ubgmjd-30-2.html) via the following link <https://uwe.rl.talis.com/modules/ubgmjd-30-2.html>

## **Part 4: Assessment**

**Assessment strategy:** Examination:

Exam (2 hours) on structural design.

Report (1000 words) on structural design.

Report:

Portfolio on soil mechanics: In-class tests, observed laboratories and retaining wall exercise (3000 words).

### **Assessment tasks:**

#### **Examination** (First Sit)

Description: Examination (2 hours)

Weighting: 35 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

#### **Portfolio** (First Sit)

Description: Portfolio (equivalent to 3000 words)

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO5, MO6, MO7

#### **Report** (First Sit)

Description: Report (1000 words)

Weighting: 15 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

**Examination (Resit)**

Description: Examination (2 hours)

Weighting: 35 %

Final assessment: Yes

Group work: No

Learning outcomes tested:

**Portfolio (Resit)**

Description: Portfolio (equivalent to 3000 words)

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested:

**Report (Resit)**

Description: Report (1000 words)

Weighting: 15 %

Final assessment: No

Group work: No

Learning outcomes tested:

**Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Civil Engineering [Jan][FT][Northshore][4yrs] - Not Running MEng 2022-23

Civil Engineering [Jan][FT][Northshore][3yrs] - Not Running BEng (Hons) 2022-23