



## **Module Specification**

### Engineering Principles for Civil Engineering

Version: 2021-22, v3.0, 25 Apr 2022

#### **Contents**

<b>Module Specification .....</b>	<b>1</b>
<b>Part 1: Information .....</b>	<b>2</b>
<b>Part 2: Description .....</b>	<b>2</b>
<b>Part 3: Teaching and learning methods .....</b>	<b>3</b>
<b>Part 4: Assessment.....</b>	<b>4</b>
<b>Part 5: Contributes towards .....</b>	<b>7</b>

## Part 1: Information

**Module title:** Engineering Principles for Civil Engineering

**Module code:** UBGMXQ-30-1

**Level:** Level 4

**For implementation from:** 2021-22

**UWE credit rating:** 30

**ECTS credit rating:** 15

**Faculty:** Faculty of Environment & Technology

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

**Partner institutions:** None

**Delivery locations:** Frenchay Campus

**Field:** Geography and Environmental Management

**Module type:** Standard

**Pre-requisites:** None

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

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

## Part 2: Description

**Overview:** This module will introduce you to the fundamentals of statics and dynamics; different types of stresses, buckling and composite sections through lectures, tutorials and laboratory work.

**Features:** Not applicable

**Educational aims:** See Learning Outcomes

**Outline syllabus:** You will cover:

Statics (forces, moments, centre of gravity, equilibrium, reactions in statically determinate structures, shear and moment diagrams and functions, qualitative analysis of beams, determinacy and stability.)

Dynamics (kinematics, projectiles, angular motions, Newton's laws of motion, energy, work, power, relative displacement and velocity, variable acceleration and vibration).

Truss analysis.

Compression and buckling.

Deflection of beams and trusses.

Axial, bending, shear and torsional stresses.

Combined stresses.

Principal stresses and Mohr's circle.

Composite sections.

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

**Teaching and learning methods:** The module is taught through a lecture series which introduces students to the key concepts and theories of the module. This is supported by tutorial sessions where students apply to theory to solve engineering problems. Formative feedback on their progress is provided in these sessions.

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

- MO1** Identify the principles of structural behaviour
- MO2** Undertake basic structural and engineering mechanics calculations
- MO3** Calculate stress and strain due to axial, bending, shear and torsion effects
- MO4** State and apply physical laws to the solution of engineering problems that arise in the study of statics and dynamics
- MO5** Analyse statically determinate beams
- MO6** Analyse statically determinate trusses
- MO7** Apply the laws of Newtonian mechanics on moving objects
- MO8** Apply principles of statics to interpret observed structural behaviour

**Hours to be allocated:** 300

**Contact hours:**

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 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/ubgmxq-30-1.html) via the following link <https://uwe.rl.talis.com/modules/ubgmxq-30-1.html>

## **Part 4: Assessment**

**Assessment strategy:** The module is taught over two semesters and includes a diverse range of engineering principles that are to be assessed. This is done primarily through examinations or tests. A series of in class tests are used to sequentially assess the learning outcomes in detail with a final exam providing a synoptic assessment of the entire module.

Depth is added to the assessment through a coursework exercise which looks in to structural behaviour in detail and develops students' ability to write and present formal engineering calculations:

**Component A1 – Examination. Learning outcomes 1-7**

A written examination that synthesises all the learning outcomes of the module through the use of questions that focus on application of the theory to non-classical questions, e.g. real life scenarios. These questions represent an increased level of complexity to the in class tests.

**Component A2 – In class tests. Learning outcomes 1-7**

In class tests that assess the basics of the learning outcomes as the module progresses; in the form of classical engineering questions. The students able to practice the questions, and receive detailed automated feedback before their final summative attempt.

The in class test represent an assessment for learning approach to support the student's development through the module, and will largely be prepared for and completed in the timetable sessions.

**Component B – Laboratory report (1000 words). Learning outcome 8**

The laboratory report allows the students to observe measure and analyse the engineering principles of stress, strain and structural behaviour. As a coursework element, it allows the concepts to be explored in more depth than the examination and in physical context.

**Assessment components:****Examination (Online) - Component A (First Sit)**

Description: Online Examination: 5 hours

Weighting: 56.25 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6, MO7

**In-class test - Component A (First Sit)**

Description: In-class test (3 hours)

Weighting: 18.75 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6, MO7

**Report - Component B (First Sit)**

Description: Report (1000 words)

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO8

**Examination (Online) - Component A (Resit)**

Description: Online Examination; 5 hours

Weighting: 56.25 %

Final assessment: Yes

Group work: No

Learning outcomes tested:

**In-class test - Component A (Resit)**

Description: In-class test (3 hours)

Weighting: 18.75 %

Final assessment: No

Group work: No

Learning outcomes tested:

**Report - Component B (Resit)**

Description: Report (1000 words)

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested:

## Part 5: Contributes towards

This module contributes towards the following programmes of study:

Civil Engineering [Sep][FT][Frenchay][4yrs] MEng 2021-22

Civil Engineering [Sep][SW][Frenchay][5yrs] MEng 2021-22

Civil and Environmental Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2021-22

Civil and Environmental Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2021-22

Civil Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2021-22

Civil Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2021-22

Civil and Environmental Engineering [Sep][PT][Frenchay][7yrs] - Not Running MEng 2020-21

Civil and Environmental Engineering [Sep][PT][Frenchay][5yrs] BEng (Hons) 2020-21

Civil and Environmental Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2020-21

Civil and Environmental Engineering {Apprenticeship-UWE} [Sep][FT][Frenchay][5yrs] - Not Running BEng (Hons) 2020-21

Civil and Environmental Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2020-21

Civil Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2020-21

Civil Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2020-21

Civil Engineering [Sep][PT][Frenchay][5yrs] BEng (Hons) 2020-21

Civil Engineering {Apprenticeship-UWE} [Sep][FT][Frenchay][5yrs] BEng (Hons) 2020-21

Civil Engineering [Sep][PT][Frenchay][7yrs] MEng 2020-21