



## **Module Specification**

### Computational Civil Engineering

Version: 2023-24, v6.0, 18 Apr 2023

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## Part 1: Information

**Module title:** Computational Civil Engineering

**Module code:** UBGMW9-15-3

**Level:** Level 6

**For implementation from:** 2023-24

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**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:** Applications of Mathematics in Civil and Environmental Engineering 2023-24, Design of Structural Elements 2023-24

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

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

## Part 2: Description

**Overview:** This module teaches computational methods and the use of tools for solving engineering problems.

**Features:** Not applicable

**Educational aims:** See Learning Outcomes.

**Outline syllabus:** You will cover:

An introduction to principles of computer programming including conditional statements, loops, subroutines and functions using Matlab and Visual Basic for Applications.

Use of pseudocode.

Validation and debugging of engineering programmes.

Development of programmes and computational tools, and the application of numerical methods to solve engineering problems.

An introduction to software packages for the analysis of engineering problems.

Visual and graphical representation of computational output.

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

**Teaching and learning methods:** The module will be taught using lectures to introduce the key principles, followed by computer practical sessions where student will apply those principles to solve problems, and will receive formative feedback on their progress.

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

**MO1** Demonstrate competence in programming fundamentals including structure and best practice

**MO2** Apply numerical methods in a programming context to solve common civil engineering problems

**MO3** Write programs to generate data for, or solve civil engineering problems

**MO4** Critically compare numerical methods and programmes, considering computational efficiency and accuracy of the results

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ubgmw9-15-3.html) via the following link

<https://uwe.rl.talis.com/modules/ubgmw9-15-3.html>

## **Part 4: Assessment**

**Assessment strategy:** This module requires the demonstrations of competence in the basic principles of programming and the application of the principles to solve problems, both assessed via a portfolio of work generated through the teaching.

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Assessment Task 1: Portfolio. Learning outcomes 1 to 4:

A portfolio presenting solutions to, and discussion of, computational civil engineering problems. These problems will allow the students to demonstrate a range of skills associated with developing and critically reviewing computational tools to solve engineering problems.

Formative feedback will be provided through the timetabled sessions as students develop their portfolio.

The resit assessment strategy for this module the same as for the first sit.

**Assessment tasks:**

**Portfolio (First Sit)**

Description: Portfolio (2000 words equivalent)

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

**Portfolio (Resit)**

Description: Portfolio (2000 words equivalent)

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

**Part 5: Contributes towards**

This module contributes towards the following programmes of study:

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

Civil and Environmental Engineering [Sep][FT][Frenchay][3yrs] - Not Running BEng (Hons) 2021-22

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

Civil and Environmental Engineering [Sep][SW][Frenchay][5yrs] - Not Running MEng 2020-21

Civil and Environmental Engineering [Sep][SW][Frenchay][4yrs] - Not Running BEng (Hons) 2020-21

Civil and Environmental Engineering {Foundation} [Sep][FT][Frenchay][4yrs] - Not Running BEng (Hons) 2020-21

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

Civil Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2020-21

Civil Engineering [Sep][SW][Frenchay][5yrs] MEng 2020-21

Civil and Environmental Engineering [Sep][PT][Frenchay][5yrs] BEng (Hons) 2019-20

Civil and Environmental Engineering {Apprenticeship-UWE}  
[Sep][FT][Frenchay][5yrs] BEng (Hons) 2019-20

Civil and Environmental Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2019-20

Civil and Environmental Engineering [Sep][PT][Frenchay][7yrs] MEng 2019-20