Module Specification

Computational Civil Engineering

Version: 2021-22, v5.0, 23 Aug 2021

Contents

Part 1: Information

Module title: Computational Civil Engineering

Module code: UBGMW9-15-3

Level: Level 6

For implementation from: 2021-22

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Geography & Envrnmental Mgmt

Partner institutions: None

Delivery locations: Frenchay Campus

Field: Geography and Environmental Management

Module type: Standard

Pre-requisites: Applications of Mathematics in Civil and Environmental Engineering 2021-22, Design of Structural Elements 2021-22

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 receive will receive formative feedback on their progress.

Module 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 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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Component A: 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.

Assessment components:

Portfolio - Component A (First Sit)
Description: Portfolio (2000 words equivalent)
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Portfolio - Component A (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 and Environmental Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20

Civil and Environmental Engineering [Sep][FT][Frenchay][4yrs] MEng 2019-20

Civil and Environmental Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19

Civil and Environmental Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19

Civil and Environmental Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19