



MODULE SPECIFICATION

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	Field	Geography and Environmental Management
Department	FET Dept of Geography & Environmental Mgmt		
Module type:	Standard		
Pre-requisites	Applications of Mathematics in Civil and Environmental Engineering 2020-21		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p>Overview: This module teaches computational methods and the use of tools for solving engineering problems.</p> <p>Educational Aims: See Learning Outcomes.</p> <p>Outline Syllabus: You will cover:</p> <p>An introduction to principles of computer programming including conditional statements, loops, subroutines and functions using Matlab and Visual Basic for Applications.</p> <p>Use of pseudocode.</p> <p>Validation and debugging of engineering programmes.</p> <p>Development of programmes and computational tools, and the application of numerical methods to solve engineering problems.</p> <p>An introduction to software packages for the analysis of engineering problems.</p> <p>Visual and graphical representation of computational output.</p>

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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.

Part 3: Assessment

This module requires the demonstrations of competence in the basic principles of programming, which is assessed via a written examination. The application of the principles to solve problems is assessed via a portfolio of work generated through the teaching.

Component A: Examination . Learning outcomes 1 and 4:
Written examination on the principles of programming.

Component B: Portfolio. Learning outcomes 2 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.

First Sit Components	Final Assessment	Element weighting	Description
Portfolio - Component B		75 %	Portfolio (2000 words equivalent)
Examination (Online) - Component A	✓	25 %	Online Examination
Resit Components	Final Assessment	Element weighting	Description
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Examination (Online) - Component A	✓	25 %	Online Examination

STUDENT AND ACADEMIC SERVICES

Part 4: Teaching and Learning Methods																	
Learning Outcomes	<p>On successful completion of this module students will achieve the following learning outcomes:</p> <table border="1"> <thead> <tr> <th style="text-align: left;">Module Learning Outcomes</th> <th style="text-align: left;">Reference</th> </tr> </thead> <tbody> <tr> <td>Demonstrate competence in programming fundamentals including structure and best practice</td> <td>MO1</td> </tr> <tr> <td>Apply numerical methods in a programming context to solve common civil engineering problems</td> <td>MO2</td> </tr> <tr> <td>Write programs to generate data for, or solve civil engineering problems</td> <td>MO3</td> </tr> <tr> <td>Critically compare numerical methods and programmes, considering computational efficiency and accuracy of the results</td> <td>MO4</td> </tr> </tbody> </table>	Module Learning Outcomes	Reference	Demonstrate competence in programming fundamentals including structure and best practice	MO1	Apply numerical methods in a programming context to solve common civil engineering problems	MO2	Write programs to generate data for, or solve civil engineering problems	MO3	Critically compare numerical methods and programmes, considering computational efficiency and accuracy of the results	MO4						
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Reading List	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p>https://uwe.rl.talis.com/index.html</p>																

Part 5: Contributes Towards
<p>This module contributes towards the following programmes of study:</p> <p>Civil and Environmental Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20</p> <p>Civil and Environmental Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19</p> <p>Civil and Environmental Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19</p> <p>Civil and Environmental Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19</p>