STUDENT AND ACADEMIC SERVICES

MODULE SPECIFICATION

Part 1: Information			
Module Title	Foundation Mathematical Structures		
Module Code	UFMFFG-15-0	Level	Level 3
For implementation from	2020-21		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Educational Aims: See Learning Outcomes.

Outline Syllabus: Logic:
Propositional and predicate logic.
Logical equivalence and logical implication.
Validity of arguments and proof by natural deduction.

Sets, Functions and Relations:
Introduction to sets, functions and relations and their applications
Set operations: e.g. union, complement, Cartesian product, power-sets.
Cardinality of sets.
Composition of functions. Injective, surjective, bijective functions. Inverse functions.
Some real-valued functions and their properties – e.g. powers, logarithms, radix conversions.
Composition of relations. Relations on a set. Reflexive, symmetric, transitive relations.
Representation by matrices.
Modelling sets, functions and relations by visual representations.

Counting:
Sum rule, product rule, principle of inclusion-exclusion, binomial coefficient.

Graph Theory:
Introduction to Graph Theory and its applications as a modelling tool, including simple and
directed graphs. Counting walks of given length. Isomorphic graphs. Representation by matrices.

Teaching and Learning Methods: Contact Hours:

Contact: 36
Assimilation and skill development :54
Coursework:15
Exam preparation: 45

Total: 150

Part 3: Assessment

Component A: an end of module online examination has been chosen to test the understanding and knowledge of the fundamentals of discrete mathematical structures.

Component B assessment: e-Assessments.
E-assessments will be used to allow students to gauge their progress by receiving immediate feedback.

One e-assessment will be based on directed reading to encourage independent learning. The second e-assessment is aimed at reinforcing the module content, partially in preparation for the examination.

First Sit Components	Final Assessment	Element weighting	Description
Examination (Online) - Component A	✓	75 %	Online Examination
Online Assignment - Component B		25 %	E-assessment
Resit Components	Final Assessment	Element weighting	Description
Examination (Online) - Component A	✓	75 %	Online Examination
Online Assignment - Component B		25 %	E-Assessment

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Part 4: Teaching and Learning Methods	
Learning Outcomes	On successful completion of this module students will achieve the following learning outcomes: <table><tr><td>**Module Learning Outcomes**</td><td>**Reference**</td></tr><tr><td>Communicate mathematical concepts using the language of discrete mathematics</td><td>MO1</td></tr><tr><td>Solve problems in the application of predicate and propositional logic</td><td>MO2</td></tr><tr><td>Define and manipulate sets using standard operations</td><td>MO3</td></tr><tr><td>Determine key properties of simple functions and relations and perform binary and unary operations on these data structures.</td><td>MO4</td></tr><tr><td>Implement basic counting techniques such as the product rule and the binomial coefficient</td><td>MO5</td></tr><tr><td>Solve simple problems in the application of graph theory</td><td>MO6</td></tr></table>
Contact Hours	**Independent Study Hours:** <table><tr><td>Independent study/self-guided study</td><td>114</td></tr><tr><td>**Total Independent Study Hours:**</td><td>114</td></tr></table> **Scheduled Learning and Teaching Hours:** <table><tr><td>Face-to-face learning</td><td>36</td></tr><tr><td>**Total Scheduled Learning and Teaching Hours:**</td><td>36</td></tr><tr><td>**Hours to be allocated**</td><td>150</td></tr><tr><td>**Allocated Hours**</td><td>150</td></tr></table>
Reading List	*The reading list for this module can be accessed via the following link:* https://uwe.rl.talis.com/modules/ufmffg-15-0.html

Part 5: Contributes Towards
This module contributes towards the following programmes of study: Mathematics with Qualified Teacher Status (QTS) {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2020-21