



MODULE SPECIFICATION

Part 1: Information			
Module Title	Foundation Mathematical Structures		
Module Code	UFMFFG-15-0	Level	Level 3
For implementation from	2019-20		
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
<p>Educational Aims: See Learning Outcomes.</p> <p>Outline Syllabus: Logic: Propositional and predicate logic. Logical equivalence and logical implication. Validity of arguments and proof by natural deduction.</p> <p>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.</p> <p>Counting: Sum rule, product rule, principle of inclusion-exclusion, binomial coefficient.</p>

STUDENT AND ACADEMIC SERVICES

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: a two hour end of module examination has been chosen to test the understanding and knowledge of the fundamentals of discrete mathematical structures under controlled conditions.

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
Online Assignment - Component B		25 %	E-assessment
Examination - Component A	✓	75 %	Examination (2 hours)
Resit Components	Final Assessment	Element weighting	Description
Online Assignment - Component B		25 %	E-Assessment
Examination - Component A	✓	75 %	Examination (2 hours)

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>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> </tbody> </table>	Module Learning Outcomes	Reference	Communicate mathematical concepts using the language of discrete mathematics	MO1	Solve problems in the application of predicate and propositional logic	MO2	Define and manipulate sets using standard operations	MO3	Determine key properties of simple functions and relations and perform binary and unary operations on these data structures.	MO4	Implement basic counting techniques such as the product rule and the binomial coefficient	MO5	Solve simple problems in the application of graph theory	MO6		
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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/modules/ufmffg-15-0.html</p>																

Part 5: Contributes Towards
This module contributes towards the following programmes of study: