University of the West of Scotland

Module Descriptor

Session: 2024/25

Title of Module: Discrete Mathematics 1			
Code: MATH07002	**SCQF Level: 7 (Scottish Credit and Qualifications Framework)**	**Credit Points: 20**	**ECTS: 10 (European Credit Transfer Scheme)**
School:	School of Computing, Engineering and Physical Sciences		
Module Co-ordinator:	Dr Kwok Chi Chim		

Summary of Module

This module gives an introduction to discrete mathematics.

The topics covered are:

- Sets and set operations, counting elements of sets and Venn diagrams;
- Basic properties of functions, including inverse functions and composite functions;
- Sequences and series of numbers, including arithmetic and geometric series, limits and summation of series, use of computer software to analyse non-routine problems;
- Recurrence relations, including first and second order linear difference equations, stability of solutions, fixed points and their stability, population models using recurrence relations, harvesting.
- The Counting Techniques, including combinations and permutations of combinatorics;
- Number Bases;
- Binomial theorem, and;
- Logic, including truth tables, propositional logic and logical equivalence.

The Graduate Attributes relevant to this module are given below:

- Academic: Critical thinker; Analytical; Inquiring; Knowledgeable; Problem-solver; Digitally literate; Autonomous.
- Personal: Motivated, Creative; Imaginative; Resilient.
- Professional: Ambitious; Driven.

Module Delivery Method

Face-To-Face	**Blended**	**Fully Online**	**HybridC**	**Hybrid 0**	**Work-Based Learning**
☒	☐	☐	☐	☐	☐

See Guidance Note for details.

Campus(es) for Module Delivery						
The module will **normally** be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit) (tick as appropriate)						
Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
☒	☐	☐	☐	☐	☐	Add name

Term(s) for Module Delivery					
(Provided viable student numbers permit).					
Term 1	☒	Term 2	☐	Term 3	☐

Learning Outcomes: (maximum of 5 statements) **These should take cognisance of the SCQF level descriptors and be at the appropriate level for the module.** At the end of this module the student will be able to:	
L1	Illustrate combinations of sets using Venn diagrams, calculate the number of elements in specified subsets and perform set operations.
L2	Solve standard problems involving sequences, series and recurrence relations.
L3	Solve standard problems involving functions and number bases.
L4	Solve standard problems involving binomial theorem, combinations and/or permutations.
L5	Solve standard problems in propositional logic.

Employability Skills and Personal Development Planning (PDP) Skills	
SCQF Headings	During completion of this module, there will be an opportunity to achieve core skills in:
Knowledge and Understanding (K and U)	SCQF Level **7** Demonstrating a broad knowledge of the basic material covered in Sets, Functions, Sequences, Combinatorics and Logic. Basic awareness of solution methods used in discrete mathematics.
Practice: Applied Knowledge and Understanding	SCQF Level **7** Ability to use basic knowledge of sets, functions, sequences, combinatorics and logic to solve routine mathematical problems.

Generic Cognitive skills	SCQF Level **7** Ability to use a range of methods to address well-defined problems in familiar contexts.	
Communication, ICT and Numeracy Skills	SCQF Level **7** Using standard methods to solve problems and present solutions in a structured coherent form.	
Autonomy, Accountability and Working with others	SCQF Level **7** Identifying and addressing their own learning needs both during and outside class time.	
Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	Module Code:	**Module Title:**
	Other:	National 5 Mathematics
Co-requisites	**Module Code:**	**Module Title:**

*Indicates that module descriptor is not published.

Learning and Teaching	
In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours.	
Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning Hours** (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture/Core Content Delivery	24
Tutorial/Synchronous Support Activity	12
Laboratory/Practical Demonstration/Workshop	12
Independent Study	152
	200 Hours Total
****Indicative Resources: (eg. Core text, journals, internet access)**	

The following materials form essential underpinning for the module content and ultimately for the learning outcomes:

Course notes on the University VLE.

"Discrete and Combinatorial Mathematics", RP Grimaldi

"Foundation Mathematics", A Croft and R Davison

“Discrete Mathematics with Graph Theory, E Goodaire”, M Parmenter

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Please ensure the list is kept short and current. Essential resources should be included, broader resources should be kept for module handbooks / Aula VLE.

Resources should be listed in Right Harvard referencing style or agreed professional body deviation and in alphabetical order.

(**N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)

Attendance and Engagement Requirements

In line with the Student Attendance and Engagement Procedure: Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.

Equality and Diversity

The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: UWS Equality, Diversity and Human Rights Code.

Please ensure any specific requirements are detailed in this section. Module Co-ordinators should consider the accessibility of their module for groups with protected characteristics..

(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)

Supplemental Information

Divisional Programme Board	Engineering and Physical Sciences

Assessment Results (Pass/Fail)	Yes ☐No ☒
School Assessment Board	Computing, Engineering and Physical Sciences
Moderator	Dr Alan Walker
External Examiner	P Wilson
Accreditation Details	
Changes/Version Number	2.14 Change to learning outcomes, employability skills and personal development planning (PDP) skills. Change to assessment, assessment outcome grids. Change to summary of module and indicative resources. Change of module coordinator and moderator. Minor change to supplementary information.

Assessment: (also refer to Assessment Outcomes Grids below)
Assessment 1: A series of class tests worth 60% of the overall mark.
Assessment 2: A series of coursework assignments worth 40% of the overall mark.
(N.B. (i) **Assessment Outcomes Grids** for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed. (ii) An **indicative schedule** listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.)

Assessment Outcome Grids (See Guidance Note)

Component 1							
Assessment Type (Footnote B.)	**Learning Outcome (1)**	**Learning Outcome (2)**	**Learning Outcome (3)**	**Learning Outcome (4)**	**Learning Outcome (5)**	**Weighting (%) of Assessment Element**	**Timetabled Contact Hours**
Class test (written)	✓	✓	✓	✓	✓	60%	3

Component 2							
Assessment Type (Footnote B.)	**Learning Outcome (1)**	**Learning Outcome (2)**	**Learning Outcome (3)**	**Learning Outcome (4)**	**Learning Outcome (5)**	**Weighting (%) of Assessment Element**	**Timetabled Contact Hours**

Coursework	✓	✓	✓	✓		40%	
Combined Total for All Components						**100%**	**3 hours**