University of the West of Scotland

Module Descriptor

Session: 2024/25

Title of Module: Applied Mathematics for Computing				
Code: MATH07012	**SCQF Level: 7 (Scottish Credit and Qualifications Framework)**	**Credit Points: 10**	**ECTS: 5 (European Credit Transfer Scheme)**	
School:	School of Computing, Engineering & Physical Sciences			
Module Co-ordinator:	Dr Kenneth Nisbet			

Summary of Module

This module provides a grounding in mathematics for students in programmes in Computer Science and related disciplines.

Some topics traditionally covered in Higher and Advanced Higher Mathematics are reviewed, extended, and deepened. An introduction to statistics is presented to provide connectivity with its use later in the range of programmes. Topics include:

Algebra: An overview of algebra required for synthesis in more detailed problems, including properties of some standard functions (polynomial, rational, exponential, trigonometric, etc.) and solving equations involving these functions; partial fraction expansion of rational functions.

Matrices: The concept of a matrix as a useful mathematical storage device. Matrix operations and application to the solution of systems of linear equations.

Vectors: The concept of two and three-dimensional vectors. Vector algebra and some common applications.

Sets and Probability: Basic concepts in set theory, including discussion of the algebra of sets. Connection to concepts in basic probability.

Statistics: Diagrammatic and descriptive statistics (including a treatment of the various measures of central tendency and spread).

The Graduate Attributes relevant to this module are given below:

- Academic: Critical thinker; Analytical; Inquiring; Knowledgeable; Problem-solver; Autonomous.
- Personal: Effective communicator; Motivated; Resilient
- Professional: Collaborative; 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	Obtain solutions to a range of problems involving basic algebra, matrices, and vectors.
L2	Obtain solutions to a range of problems in set theory and probability.
L3	Perform suitable statistical analysis in a range of problems.
L4	Click or tap here to enter text.
L5	Click or tap here to enter text.

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** Developing a broad knowledge of a range of important mathematical concepts, including algebra, matrices, vectors, and sets. Developing a basic awareness of the evolution of fundamental mathematical ideas and methods over time, and of the basics of diagrammatic and descriptive statistics.

Practice: Applied Knowledge and Understanding	SCQF Level **7** Showing an ability to perform basic calculations in routine contexts.	
Generic Cognitive skills	SCQF Level **7** Presenting mathematical and statistical arguments, such as performing calculations, generating graphical output, and providing basic verifications. Explaining mathematical and statistical reasoning, using a range of concepts.	
Communication, ICT and Numeracy Skills	SCQF Level **7** Using the output from mathematical and statistical reasoning to communicate results in a coherent way.	
Autonomy, Accountability and Working with others	SCQF Level **7** Identifying and addressing their own learning needs both during and outside class time. Working in a small group context to produce coherent mathematical and statistical output.	
Pre-requisites:	Before undertaking this module, the student should have undertaken the following:	
	Module Code:	**Module Title:**
	Other:	Higher Mathematics, or equivalent
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	12
Tutorial/Synchronous Support Activity	6

Independent Study	82
	Hours Total 100

****Indicative Resources: (e.g. Core text, journals, internet access)**

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

Class notes as published on the University VLE.

No set text is required, but OpenStax free online texts such as

OpenStax Statistics
OpenStax Algebra

will be very useful.

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 & Physical Sciences
Assessment Results (Pass/Fail)	Yes ☐No ☒
School Assessment Board	Computing, Engineering & Physical Sciences
Moderator	Dr Alan Walker
External Examiner	C Guiver
Accreditation Details	
Changes/Version Number	1.01.

Assessment: (also refer to Assessment Outcomes Grids below)
The module is assessed by a coursework exercise, forming one component, and a final unseen exercise forming a second component.
Assessment 1: Individual unseen Class Test (60%)
Assessment 2: A Group Coursework Task (40%)
(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 (unseen, closed book)	√	√				60%	2

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 Assignment		√	√			40%	1

Component 3							
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**
Combined Total for All Components						**100%**	**3 hours**

Change Control:

What	When	Who
Further guidance on aggregate regulation and application when completing template	16/01/2020	H McLean
Updated contact hours	14/09/21	H McLean
Updated Student Attendance and Engagement Procedure	19/10/2023	C Winter
Updated UWS Equality, Diversity and Human Rights Code	19/10/2023	C Winter
Guidance Note 23-24 provided	12/12/23	D Taylor
General housekeeping to text across sections. .	12/12/23	D Taylor

Version Number: MD Template 1 (2023-24)