

Prifysgol Wreccsam Wrexham University

Module specification

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Module Code	COM397
Module Title	Maths and Computing for Problem Solving
Level	3
Credit value	20
Faculty	FACE
HECoS Code	101029
Cost Code	GACP
Pre-requisite module	N/A

Programmes in which module to be offered

Programme title	Core/Optional/Standalone
STEM Foundation Year	Optional

Breakdown of module hours

Learning and teaching hours	24 hrs
Placement tutor support hours	0 hrs
Supervised learning hours e.g. practical classes, workshops	16 hrs
Project supervision hours	0 hrs
Active learning and teaching hours total	40 hrs
Placement hours	0 hrs
Guided independent study hours	160 hrs
Module duration (Total hours)	200 hrs

Module aims

To integrate mathematical principles and programming skills in an engaging and practical manner, enhancing students' ability to solve real-world problems in computing, engineering, and the built environment. This module aims to build confidence in using mathematical concepts and computational thinking, fostering a problem-solving mindset.

Module Learning Outcomes

At the end of this module, students will be able to:

1	Understand units, fractions, indices, logarithms and polynomials; also, use algebra to manipulate equations and to solve geometric problems including distance, midpoint, slope, perimeters, areas and volumes.
2	Use trigonometric principles, including Pythagoras' theorem, sine, cosine, and tangent ratios, apply the sine and cosine rules and understand the ratio pi.
3	Represent data in various formats (tables, graphs, charts) and analyse the data using standard statistical methods, including mean, median, mode, standard deviation, etc..
4	Design, write, and debug programs that solve mathematical problems and simulate real-world scenarios, demonstrate an understanding of algorithms and computational thinking.

Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Assessment 1:

The in-class test assesses overall understanding across the module topics, aiming to develop mathematical and programming proficiency for real-world challenges in computing, engineering, and the built environment.

Assessment 2:

The portfolio requires solving problems using traditional methods and programming, with a reflective commentary.

Assessment number	Learning Outcomes to be met	Type of assessment	Duration/Word Count	Weighting (%)	Alternative assessment, if applicable
1	1,2	In-class test	1 hour	40	
2	3,4	Portfolio	N/A	60	

Derogations

None

Learning and Teaching Strategies

Aligned with the principles of the Active Learning Framework (ALF), the module will incorporate a blended digital approach utilising a Virtual Learning Environment (VLE). These resources may include a range of content such as first and third-party tutorials, instructional videos,

supplementary files, online activities, and other relevant materials to enhance their learning experience.

The module will be delivered through a combination of lectures, tutorials, practical and programming sessions. Interactive workshops will facilitate hands-on learning, while case studies and project work will allow students to apply their knowledge to real-world scenarios. Access to lecture materials and additional resources will be provided via the University's VLE platform

Welsh Elements

Elements of the Welsh language and culture will be embedded throughout the module.

Indicative Syllabus Outline

Number Systems and Data Representation

Units, Fractions, Indices, Logarithms and Polynomials.

Algebra: Rearranging and Manipulating Equations.

Geometry: Distances, Midpoints, Perimeters, Areas and Volumes. Simpsons and Mid-Ordinant rules.

Trigonometry: Pythagoras' Theorem. Sine, Cosine and Tangent ratios. Sine and Cosine rules. Circles, the ratio Pi, Circumference and Area.

Basic Statistics and Data Analysis – Mean, Median, Mode, Inter-Quartile Ranges and Standard Deviations. Graphical Representation – Bar Charts, Histograms, Scatter Graphs.

Algorithms and Computational Thinking.

Problem-Solving with Programming.

Indicative Bibliography

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads:

Croft, A. and Davison, R. (2016), *Foundation Maths*, 6th Ed. Prentice Hall.

Other indicative reading:

Stroud, K.A, Booth, D.J (2009), *Foundation Mathematics*, 1st Ed. Palgrave.

Jenkyns, T. & Stephenson, B. (2018), *Fundamentals of Discrete Math for Computer Science*. 2nd Ed. Springer

Administrative Information

For office use only	
Initial approval date	4 Sept 2024
With effect from date	Sep 2024



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Date and details of revision	July 2025: Reapproved as part of IFY validation Sept 2026: Template update
Version number	3