

Module Specification

Mathematics for Robotics

Version: 2025-26, v1.0, 07 Apr 2025

Contents	
Module Specification	1
Part 1: Information	2
Part 2: Description Part 3: Teaching and learning methods	2
	3
Part 4: Assessment	4
Part 5: Contributes towards	5

Part 1: Information

Module title: Mathematics for Robotics

Module code: UFMEAT-15-1

Level: Level 4

For implementation from: 2025-26

UWE credit rating: 15

ECTS credit rating: 7.5

College: College of Arts, Technology and Environment

School: CATE School of Engineering

Partner institutions: None

Field: Engineering, Design and Mathematics

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: After successful completion of this module students will have the requisite mathematical knowledge and skills to apply mathematical methods towards the solution and analysis of a variety of engineering problems.

In this module students will be introduced to a computer-based methodology for solving mathematical problems and presenting numerically based information, often in the context of engineering models.

> Page 2 of 5 09 May 2025

The work will involve development of coding skills, but no prior knowledge is assumed. The module will integrate study of mathematics with engineering subjects studied in other level 4 modules.

Features: Not applicable

Educational aims: This module provides the initial underpinning for mathematical skills and analysis of engineering problems studied in the Robotics programme.

Outline syllabus: This module will include fundamental mathematical concepts that are essential to robotics engineering such as standard engineering functions, complex numbers, differentiation, integration, matrices and first order differential equations. Use of software for solving mathematical problems will also be covered.

Part 3: Teaching and learning methods

Teaching and learning methods: The typical delivery includes study of pre-class materials, and weekly classes including a lecture (instructor-led), workshop (tutor-assisted individual or group work) and computer lab (tutor-assisted individual work).

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Apply appropriate techniques to solve mathematical problems encompassing elementary functions, complex numbers and calculus.

MO2 Use mathematical software to implement solution methods for mathematical and numerical questions.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Page 3 of 5 09 May 2025 **Reading list:** The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link <u>https://rl.talis.com/3/uwe/lists/A6549398-A042-D0E5-6B8D-7F260707F74C.html</u>

Part 4: Assessment

Assessment strategy: The assessment is designed to allow students to build confidence in their mathematical abilities over time and to be able to demonstrate the use of computer-based methods for implementing mathematical solutions to engineering problems.

Students will complete a series of informal tasks throughout the semester, designed to provide regular feedback to students. The only summative assessment will consist of a timed examination at the end of the semester, which build on the informal tasks.

The resit assessment will follow the same format as the first sit assessment profile.

Assessment tasks:

Examination (First Sit)

Description: PC-based examination involving use of mathematical software (3 hours). The exam answers will be submitted electronically before the end of the allocated time. Weighting: 100 % Final assessment: Yes Group work: No Learning outcomes tested: MO1, MO2

Examination (Resit)

Description: PC-based examination involving use of mathematical software (3 hours). The exam answers will be submitted electronically before the end of the allocated time.

Weighting: 100 %

Final assessment: Yes Group work: No Learning outcomes tested: MO1, MO2

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Robotics [Frenchay] BEng (Hons) 2025-26

Robotics {Foundation} [Frenchay] BEng (Hons) 2024-25