Module Specification

Digital and Mechanics Skills

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Contents

Part 1: Information

Module title: Digital and Mechanics Skills

Module code: UFMEAU-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: This module first covers the basic computer design tools necessary for many modern engineering disciplines before a mathematical treatment of basic mechanics theory is covered. Relevant mathematical concepts such as vectors and differential equations will be introduced where necessary and applied to typical robotics tasks.

Features: Not applicable

Educational aims: The aim of this module is to provide a fundamental framework of computer aided design as required by most modern engineers. Students will have a solid foundation to build upon should they need to advance their skills in their career. Mathematical modelling of rigid bodies (developed via CAD or otherwise) is likewise a fundamental skill required and the module applies and enhances many of the methods introduced in the earlier maths module.

Outline syllabus: CAD: 2D sketching
CAD: 3D part modelling
Vectors, kinematics and dynamics
Rotational dynamics
Rigid-bodies

Part 3: Teaching and learning methods

Teaching and learning methods: One 1hr lecture/seminar per week. First four weeks have one 2hr computer practical with remaining sessions in seminar room for guided group and individual exercises.

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

MO1 Apply design and modelling skills including through relevant software.

MO2 Model and apply mathematical analysis to rigid-bodies in a range of engineering applications.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://rl.talis.com/3/uwe/lists/30793E3D-9BB1-6411-E434-DA52CC3517FF.html

Part 4: Assessment

Assessment strategy: Students are given 3 hours in an online exam to design a CAD model and answer questions on the shape (e.g. draw free body diagram). Some other dynamics questions also. Resit will follow a similar format. Assessment is individual throughout. This format is chosen so as to simultaneously assess CAD skills and mechanics understanding in a single sitting (as per UWE Programmes policy), while maintaining direct ties to Robotics discipline. Certain parameters of the exam will be individualised to minimise opportunities for plagiarism and collusion.

Formative computer-based and desk-based exercises provided throughout where students are encouraged to, but not required to, work in small groups.

Assessment tasks:

Examination (Online) (First Sit)
Description: Online exam: 3 hours (+ 2 for scanning and upload)
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2

Examination (Online) (Resit)
Description: Online exam: 3 hours (+ 2 for scanning and upload)
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