Module Specification

Mathematical Sciences Case Studies

Version: 2023-24, v2.0, 15 May 2023

Contents

Part 1: Information

Module title: Mathematical Sciences Case Studies

Module code: UFMFMH-15-M

Level: Level 7

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Field: Engineering, Design and Mathematics

Module type: Module

Pre-requisites: Mathematics, Statistics and Operational Research Project A 2023-24, Mathematics, Statistics and Operational Research Project B 2023-24

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Not applicable

Features: Not applicable

Educational aims: See Learning Outcomes.

Outline syllabus: In this module students will become familiar with methods and techniques to solve problems in applied mathematics through three separate case

studies. In the first case study students will be introduced to a specific problem, and will be guided through: (i) the modelling process and mathematical formulation of the problem, (ii) simplifying and solving the resulting mathematical model and (iii) interpreting and communicating the results. In the second and third case studies students will be able to choose problems arising from a broad range of applications that cover topics in mathematics/statistics/probability.

Part 3: Teaching and learning methods

Teaching and learning methods: During case study one there will whole group lectures, used to deliver material on the specified topic. For case studies two and three students are required to choose problems from an extensive list that covers a range of topics in applied mathematics/probability/and statistics from a broad spectrum of applied problems, such as environmental, health, social. In the second case study students will be given guided reading, where as in the third case study they will need to research independently appropriate techniques for modelling and solving their chosen problem. For case studies two and three students will be allocated an advisor, the role of the advisor is provide guidance and monitor progress through regular meetings. Alongside this there will also be some scheduled whole group workshops.

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

MO1 Solve and analyse applied problems that arise in a broad range of unfamiliar contexts, derive suitable mathematical models, select appropriate mathematical techniques, and critically evaluate their effectiveness

MO2 Demonstrate research skills and the ability to read critically a range of source material that covers advanced topics in mathematics/statistics/probability

MO3 Communicate their results effectively in a variety of forms

MO4 Demonstrate awareness of the impact of the subject on society

MO5 Show evidence of independent learning

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/index.html

Part 4: Assessment

Assessment strategy: The assessment will involve the completion of two tasks at both sit and resit.

The first task (a presentation), is based on the second case study. Students will need to communicate effectively their chosen problem, describe the mathematical model, their results, conclusions and critical evaluation.

The second task is based on the third case study, and is assessed by an individual written report. Students will be required to present their model, results and critically evaluate their work.

The first three learning outcomes will be assessed via the presentation and all five, in particular the fifth one, will be assessed in the individual written report.

Assessment tasks:

Presentation (First Sit)
Description: Presentation (30 mins)
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3

Report (First Sit)

Description: Individual report (2500 words)

Weighting: 75 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Presentation (Resit)

Description: Presentation (30 minutes)

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3

Report (Resit)

Description: Individual report (2500 words)

Weighting: 75 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mathematics [Sep][FT][Frenchay][4yrs] - Not Running MMath 2020-21

Mathematics [Sep][SW][Frenchay][5yrs] MMath 2019-20