Module Specification

Higher Mathematics [TSI]

Version: 2023-24, v2.0, 20 Mar 2023

Contents

Part 1: Information

Module title: Higher Mathematics [TSI]

Module code: UFCFDW-30-0

Level: Level 3

For implementation from: 2023-24

UWE credit rating: 30

ECTS credit rating: 15

Faculty: Faculty of Environment & Technology

Department: FET Dept of Computer Sci & Creative Tech

Partner institutions: None

Delivery locations: Not in use for Modules

Field: Computer Science and Creative Technologies

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 provides theoretical foundations of the higher mathematic fundamentals such as linear and vector algebra, function of several variables and to develop logical and the algorithmic thinking of students for solution of applied and theoretical tasks.

Features: Not applicable

Educational aims: The aim of the module is to provide theoretical foundations of the higher mathematic fundamentals such as linear and vector algebra, function of several variables and to develop logical and the algorithmic thinking of students for solution of applied and theoretical tasks. Development of the basis of the mathematical knowledge and creation of a platform for further mathematical education.

Outline syllabus: The module covers the following topic areas:

Term 1:
Linear and vector algebra
Analytic geometry
Functions and their characteristics
Limits of numerical sequences and functions of one variable.
Continuity of functions.
Derivatives of function, interpretations and computation.

Term 2:
Definite and indefinite integrals
Functions of several variables
Ordinary differential equations and systems of the differential equations.
Functional series (power, Taylor, Fourier)
Multiple integrals.
Linear spaces and operators.

Part 3: Teaching and learning methods

Teaching and learning methods: Learning and teaching will be provided to students in two forms: lectures and labs. During lectures, theoretical aspects of the course will be provided to students by the teaching staff. Lectures will be supported by presentation published and available to the students on e.tsi.lv under the module section. Also, the course includes additional materials, like textbooks, publications on the internet, videos etc.

During practical calculus classes, students receive a set of practical problems for every topic to perform. Several practical problems are explained during classes by a teaching assistant, while other problems are provided as a homework.

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

MO1 Use main statements, theorems and definitions of higher mathematics

MO2 Understand main principles and laws of linear and vector algebra, analytical geometry, theory of functions, mathematical and functional analysis

MO3 Apply core mathematical methods of problem solving and be able to apply then for applied tasks

MO4 Able to solve core mathematical problems using modern approaches and methods

MO5 Able to formulate a problem, develop an approach to its solution and competently interpret the results

MO6 Have a skill of appropriate and efficient solving method selection

MO7 Apply abstract thinking, analysis and synthesis

MO8 Ability to implement core methods of mathematical reasoning, to use mathematics for correct presentation and proving own knowledge

MO9 Use mathematics as a universal language of science and a tool for modelling of real phenomena and processes

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 96 hours

Face-to-face learning = 144 hours

Total = 240

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/87E24D6C-C796-7F93-9450-93F7A7C792A7.html?lang=en-gb&login=1

Part 4: Assessment

Assessment strategy: This module assessment is split into two (Exam, In-semester Assignments). Both should be completed individually (i.e. this is not group work). Due to the large volume of the course, the exam is split into 4 components – two in-semester colloquiums and two end-term exams (for the first and second terms).

A 3 hour exam that includes both theoretical and practical parts.

A series of in-class tests used to gauge students progress and understanding throughout the module.

A series of tasks - Includes solutions for a set of problems on every topic covered in the module.

Assessment components:

Examination (First Sit)
Description: Exam and includes practical assignments as well as theoretical questions
Weighting: 20 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO5, MO7

In-class test (First Sit)
Description: A series of in-class tests, covering theoretical knowledge of linear and vector algebra and analytic geometry and integral calculus
Weighting: 30 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO5, MO7

Portfolio (First Sit)

Description: A series of tasks - Includes solutions for a set of problems on every topic covered in the module

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO3, MO4, MO6, MO7, MO8

Examination (Resit)

Description: Exam and includes practical assignments as well as theoretical questions

Weighting: 20 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO5, MO7

In-class test (Resit)

Description: A series of in-class tests, covering theoretical knowledge of linear and vector algebra and analytic geometry and integral calculus

Weighting: 30 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO5, MO7

Portfolio (Resit)

Description: A series of tasks - Includes solutions for a set of problems on every topic covered in the module

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO3, MO4, MO6, MO7, MO8

Part 5: Contributes towards

This module contributes towards the following programmes of study: