Module Specification

Foundation Mathematics: Algebra and Calculus

Version: 2023-24, v2.0, 06 Jul 2023

Contents

Part 1: Information

Module title: Foundation Mathematics: Algebra and Calculus

Module code: UFMFBG-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

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: Not applicable

Features: Not applicable

Educational aims: See Learning Outcomes

Outline syllabus: Numbers and Calculations

Indices, Standard Form, Percentages, Logarithms. Compound Interest and

Continuous compounding.

Algebra

Basic Algebra. Factorisation. Algebraic Fractions, Linear Equations. Rearranging Formulae. Simultaneous Linear Equations. Linear Equations and Graphs. Quadratic Equations. Solving Quadratics by completing the square. Graphs of Quadratic Functions. Simultaneous Solution of Quadratic and Linear Equations. Introduction to Partial Fractions. Arithmetic and Geometric Series.

Functions

Functions and inverses. Function of a Function. Properties of standard functions used in engineering: polynomial, rational, trigonometric, exponential and logarithmic functions.

Calculus

Differential Calculus. The Derivates of other Functions. Maxima and Minima. The Chain Rule (or Composite Rule). The Product Rule and Quotient Rule. The Second Derivative. Integration. The Definite Integral. Introduction to Integration by Parts and Integration by Substitution.

Part 3: Teaching and learning methods

Teaching and learning methods: By classroom teaching and directed reading:

Students will be provided with essential course reading material in the form of a comprehensive module handbook containing lecture notes. There is support material in the form of downloadable video and audio files.

The learning strategy is to guide students through highly structured workbooks that encourage active learning. The video and audio files allow students to consolidate

their understanding. The aim is to ensure that foundation level students have mastery and fluency of concepts, methods and communication of this material which underpins much of the analytical work they would encounter at level 1.

Students will be guided to extra resources on the web where necessary and they may consult the indicative reading list below to assist understanding.

Scheduled learning includes lectures with tutorial sessions.

Independent learning includes hours engaged in solving worksheet problems and preparation for assessments.

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

MO1 Perform numerical calculations to an appropriate level of accuracy

MO2 Interpret an algebraic expression and select an appropriate method for changing the subject of the expression

MO3 Solve equations that involve standard mathematical functions used in engineering

MO4 Differentiate and integrate standard mathematical functions used in engineering

MO5 Select and apply suitable mathematical techniques to solve extended problems

MO6 Communicate mathematical arguments using clear, appropriate and consistent notation

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Total = 300

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/modules/ufmfbg-30-0.html

Part 4: Assessment

Assessment strategy: The assessment strategy has two tasks

Task 1 is a portfolio of e-assessments taken throughout the year and provides formative feedback to students and regular points of engagement.

Task 2: is an end of module online examination that assesses the students' ability to select appropriate techniques and and apply their knowledge and skills to the solution of extended mathematical problem.

The resit assessment strategy repeats the 1st sit assessment except that the portfolio of e-assessments delivered throughout the year is set as a single assessment.

The GCET delivery of the end of module exam is a 3 hour face-to-face/invigilated exam. It was agreed that GCET can deliver the exam in a different way to UWE for in-country reasons.

Assessment tasks:

Examination (Online) (First Sit)
Description: Online Examination under controlled conditions (3 hours)
Weighting: 75 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO3, MO4, MO5, MO6

Online Assignment (First Sit)

Description: series of e -Assessments

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (Online) (Resit)

Description: Online Examination under controlled conditions (3 hours)

Weighting: 75 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO3, MO4, MO5, MO6

Online Assignment (Resit)

Description: e -Assessment

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mechatronics Engineering {Foundation} [Frenchay] MEng 2023-24

Mathematics {Foundation} [Frenchay] BSc (Hons) 2023-24

Mechanical Engineering and Technology {Foundation} [GCET] BEng (Hons) 2023-24

Mechanical Engineering and Technology (Vehicle Technology) {Foundation} [GCET] BEng (Hons) 2023-24

Mechanical Engineering and Technology (Mechatronics) {Foundation} [GCET] BEng (Hons) 2023-24

Mechanical Engineering and Technology (Manufacturing) {Foundation} [GCET] BEng (Hons) 2023-24

Electronics and Telecommunication Engineering {Foundation} [GCET] BEng (Hons) 2023-24

Instrumentation and Control Engineering {Foundation} [GCET] BEng (Hons) 2023-24

Instrumentation and Control Engineering {Foundation} [GCET] BEng (Hons) 2023-24

Automation and Robotics Engineering {Foundation} [GCET] BEng (Hons) 2023-24

Automation and Robotics Engineering {Foundation} [GCET] DipHE 2023-24

Electronics and Telecommunication Engineering {Foundation} [GCET] DipHE 2023-24

Instrumentation and Control Engineering {Foundation} [GCET] DipHE 2023-24

Instrumentation and Control Engineering {Foundation} [GCET] DipHE 2023-24

Mechanical Engineering and Technology (Manufacturing) {Foundation} [GCET] DipHE 2023-24

Mechanical Engineering and Technology (Mechatronics) {Foundation} [GCET] DipHE 2023-24

Mechanical Engineering and Technology (Vehicle Technology) {Foundation} [GCET] DipHE 2023-24

Mechanical Engineering and Technology {Foundation} [GCET] DipHE 2023-24

Energy Technology and Management {Foundation} [GCET] BSc (Hons) 2023-24

Energy Technology and Management {Foundation} [GCET] DipHE 2023-24

Building Services Engineering {Foundation} [GCET] DipHE 2023-24

Electronic Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Engineering {Foundation} [Frenchay] BSc (Hons) 2023-24

Automotive Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering with Pilot Studies {Foundation} [Frenchay] BEng (Hons) 2023-24

Civil Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Mechatronics Engineering {Foundation}[Frenchay] BEng (Hons) 2023-24

Electrical and Electronic Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Building Services Engineering {Foundation} [GCET] BEng (Hons) 2023-24

Robotics {Foundation} [Frenchay] BEng (Hons) 2023-24