Module Specification

Mathematics for Civil and Environmental Engineering

Version: 2021-22, v3.0, 25 Apr 2022

Contents

Part 1: Information

Module title: UFMFYG-15-1 Mathematics for Civil and Environmental Engineering

Module code: UFMFYG-15-1

Level: Level 4

For implementation from: 2021-22

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Delivery locations: Frenchay Campus, Northshore College of Business and Technology

Field: Engineering, Design and Mathematics

Module type: Standard

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: In this module students will study standard mathematical techniques used in the solution of engineering problems.

Features: Not applicable

Educational aims: See Learning Outcomes

Outline syllabus: Algebraic Manipulation and Standard engineering functions: Dimensions, polynomials, rational functions, exponential and logarithmic functions, trigonometric and hyperbolic functions, the inverse function, solving non-linear equations.

Matrix and Vector Algebra: Properties of matrices and determinants, the inverse matrix, Gaussian elimination. Vector and scalar quantities, resolution of forces, properties of vector quantities, vector addition, unit vectors, position vectors, scalar product, vector product.

Differential and Integral Calculus: Limits, average rate and instantaneous rate of change, differentiation, linearity, product rule, quotient rule and chain rule. Higher order derivatives, classification of turning points. Integration, indefinite and definite integration, integration by parts, numerical integration. First order differential equations, separation of variables.

Part 3: Teaching and learning methods

Teaching and learning methods: Scheduled learning includes lectures and workshops with tutorial sessions.

Independent learning includes hours engaged in problem solving and preparation of tutorial questions.

Contact time: 36 hours

Assimilation and skill development: 54 hours

Coursework: 15 hours

Exam preparation: 45 hours

Total: 150 hours

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

MO1 Select and apply appropriate techniques from calculus to the solution of a given problem

MO2 Select and apply appropriate techniques from linear algebra to the solution of a given problem

MO3 Interpret a mathematical model in terms of the physical problem being described with reference to the underlying assumptions and limitations of the mode

MO4 Use appropriate notation and terminology to communicate mathematical concepts

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/modules/ufmfyg-15-1.html

Part 4: Assessment

Assessment strategy: Component A, an end of module examination has been chosen to test the understanding and knowledge of functions, calculus and linear algebra techniques under controlled conditions.

Component B, uses an e-assessment strategy to provide regular and rapid feedback to help students consolidate their knowledge as the module progresses.

Assessment components:

Examination (Online) - Component A (First Sit)
Description: Online Examination: 5 hours

Weighting: 75 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Online Assignment - Component B (First Sit)

Description: E-assessment

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2

Examination (Online) - Component A (Resit)

Description: Online Examination: 5 hours

Weighting: 75 %

Final assessment: Yes

Group work: No

Learning outcomes tested:

Online Assignment - Component B (Resit)

Description: E-assessment

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested:

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Civil Engineering [Sep][FT][Frenchay][4yrs] MEng 2021-22

Building Services Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2021-22

Civil Engineering [Sep][SW][Frenchay][5yrs] MEng 2021-22

Civil Engineering [Jan][FT][Northshore][4yrs] MEng 2021-22

Civil Engineering [Jan][FT][Northshore][3yrs] BEng (Hons) 2021-22

Civil and Environmental Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2021-22

Civil and Environmental Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2021-22

Civil Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2021-22

Civil Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2021-22

Architecture and Environmental Engineering [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Architecture and Environmental Engineering [Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Building Services Engineering {Foundation} [Oct][FT][GCET][4yrs] BEng (Hons) 2020-21

Building Services Engineering {Apprenticeship-UWE} [Sep][FT][Frenchay][5yrs] BEng (Hons) 2020-21

Building Services Engineering {Foundation} [Feb][FT][GCET][4yrs] BEng (Hons) 2020-21

Civil and Environmental Engineering [Sep][PT][Frenchay][7yrs] - Not Running MEng 2020-21

Civil and Environmental Engineering [Sep][PT][Frenchay][5yrs] BEng (Hons) 2020-21

Civil and Environmental Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2020-21

Civil and Environmental Engineering {Apprenticeship-UWE} [Sep][FT][Frenchay][5yrs] - Not Running BEng (Hons) 2020-21

Civil and Environmental Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2020-21

Civil Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2020-21

Civil Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2020-21

Civil Engineering [Sep][PT][Frenchay][5yrs] BEng (Hons) 2020-21

Civil Engineering {Apprenticeship-UWE} [Sep][FT][Frenchay][5yrs] BEng (Hons) 2020-21

Civil Engineering [Sep][PT][Frenchay][7yrs] MEng 2020-21

Architecture and Environmental Engineering {Foundation} [Sep][SW][Frenchay][6yrs] BEng (Hons) 2020-21

Architecture and Environmental Engineering {Foundation} [Sep][FT][Frenchay][5yrs] BEng (Hons) 2020-21