Module Specification

Foundation Mathematical Structures

Version: 2023-24, v2.0, 31 Jan 2023

Contents

Part 1: Information

Module title: Foundation Mathematical Structures

Module code: UFMFFG-15-0

Level: Level 3

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

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: Logic:
Propositional and predicate logic.
Logical equivalence and logical implication.

Validity of arguments and proof by natural deduction.

Sets, Functions and Relations:
Introduction to sets, functions and relations and their applications
Set operations: e.g. union, complement, Cartesian product, power-sets.
Cardinality of sets.
Composition of functions. Injective, surjective, bijective functions. Inverse functions.
Some real-valued functions and their properties – e.g. powers, logarithms, radix conversions.
Composition of relations. Relations on a set. Reflexive, symmetric, transitive relations. Representation by matrices.
Modelling sets, functions and relations by visual representations.

Counting:
Sum rule, product rule, principle of inclusion-exclusion, binomial coefficient.

Graph Theory:
Introduction to Graph Theory and its applications as a modelling tool, including simple and directed graphs. Counting walks of given length. Isomorphic graphs. Representation by matrices.

Part 3: Teaching and learning methods

Teaching and learning methods: Contact Hours:

Contact: 36
Assimilation and skill development :54
Coursework:15
Exam preparation: 45

Total: 150

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

MO1 Communicate mathematical concepts using the language of discrete mathematics

MO2 Solve problems in the application of predicate and propositional logic

MO3 Define and manipulate sets using standard operations

MO4 Determine key properties of simple functions and relations and perform binary and unary operations on these data structures.

MO5 Implement basic counting techniques such as the product rule and the binomial coefficient

MO6 Solve simple problems in the application of graph theory

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/ufmffg-15-0.html

Part 4: Assessment

Assessment strategy: An end of module online examination has been chosen to test the understanding and knowledge of the fundamentals of discrete mathematical structures.

E-assessments will be used to allow students to gauge their progress by receiving immediate feedback.

One e-assessment will be based on directed reading to encourage independent learning. The second e-assessment is aimed at reinforcing the module content, partially in preparation for the examination.

Assessment tasks:

Examination (Online) (First Sit)
Description: Online Examination
Weighting: 75 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6

Online Assignment (First Sit)
Description: E-assessment
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO3, MO4, MO5

Examination (Online) (Resit)
Description: Online Examination
Weighting: 75 %
Final assessment: Yes
Group work: No
Learning outcomes tested:

Online Assignment (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:

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