Module Specification

Mathematics for Computing

Version: 2023-24, v2.0, 19 Jul 2023

Contents

Part 1: Information

Module title: Mathematics for Computing

Module code: UFCFJ1-15-0

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: The British College Nepal

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: N/A

Part 2: Description

Overview: This module is designed to introduce students to methods and models of computer mathematics: logical functions, logical networks, finite automaton, graph theory and algorithm theory.

Features: Not applicable

Educational aims: This module aims to introduce concepts and ideas of discrete mathematics such as formal mathematical reasoning techniques, basic counting

techniques and their applications for computing students. The module gives students training in the ability to think quantitatively and analyse problems critically.

Outline syllabus: The indicative syllabus covers:

Logic, Propositional Equivalences,

Predicates and Quantifiers,

Methods of Proofs,

Sets and Types, Probability,

Matrices and Linear Operators,

Linear Algebra and Vector spaces,

Graphs

Finite state automatons (machines)

Part 3: Teaching and learning methods

Teaching and learning methods: Lecture: In person, Blended Learning, Tutorials, Seminars, Online Lectures.

Lectures will be used to introduce much of the material, with example demos being used as part of the module. There will be a range of exercises in the tutorials designed to reinforce the theory and develop skills across the development lifecycle. A range of additional resources will be made available via the TBC VLE e.g. short quizzes, further exercises etc.

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

MO1 Apply Boolean algebra for solving algorithmic problems.

MO2 Apply mathematical foundations, algorithmic principles, and finite machine theory in the modelling and design of computer-based systems.

MO3 Solve various problems in the theory of logical functions.

MO4 Apply graph theory to application problems such as computer networks.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 102 hours

Face-to-face learning = 48 hours

Total = 150

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/8A6456A4-B1E0-55C3-B08D-CF7DB0722C90.html?lang=en-GB&login=1

Part 4: Assessment

Assessment strategy: During the semester, the students will receive a series of worksheets directly relating to the taught material. Students will submit an individual portfolio consisting of a subset of the total number of worksheets that they complete during the taught semester. This subset will be established by the module leader and communicated to students in advance. Students need to submit at least eighty percent of the total number of worksheets in their portfolio. This enables students who may have missed a week to pass. These worksheets will be based on practical problems and applications for the topics covered. Feedback will be given to students after each worksheet is marked in order to help them improve their understanding. The assessment strategy for this module is based on assessing students throughout the taught element of the module. This gives students regular feedback on their performance and areas they need to improve on.

The final task is an unseen examination which also tests all learning outcomes.

Students can use their portfolio to prepare for the examination. The unseen examination format is a common and well-understood assessment tool in Nepal. Although this is an unseen exam, it uses a case study distributed in advance. Students will be prepared for the exam having used a different case study in the taught work.

The examination will be carried out at the end of the module. Students will be provided with a case study before the exam which they can prepare from. The exam covers all of the learning outcomes and is a required assessment, especially where students may have missed part of the coursework assessment of worksheets.

For the resit, students will rework the portfolio worksheets to demonstrate achievement of the learning outcomes. The exam will consider a comparable case study to the first sit.

Assessment tasks:

Portfolio (First Sit)
Description: Students will submit a portfolio of worksheets that they will complete throughout the semester. The students will be asked to submit a subset of the full set of worksheets completed during the semester as part of the portfolio. These worksheets will be based on practical problems and applications for the topics covered.
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (First Sit)
Description: The examination (2 hours) will be carried out at the end of the module. Students will be provided with a case study before the exam which they can prepare from. The case study will include practical problems/applications which students need to explore and prepare for ahead of the exam.
Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Portfolio (Resit)

Description: Students will submit a portfolio of worksheets that they will complete throughout the semester. The students will be asked to submit a subset of the full set of worksheets completed during the semester as part of the portfolio. These worksheets will be based on practical problems and applications for the topics covered.

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (Resit)

Description: The examination (2 hours) will be carried out at the end of the module. Students will be provided with a case study before the exam which they can prepare from. The case study will include practical problems/applications which students need to explore and prepare for ahead of the exam.

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study: