Module Specification

Programming for Engineers

Version: 2023-24, v4.0, 19 Jul 2023

Contents

Part 1: Information

Module title: Programming for Engineers

Module code: UFMFGT-15-1

Level: Level 4

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Field: Engineering, Design and Mathematics

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: Programming is a core component in the development of embedded and autonomous systems. This module will provide students with fundamental programming concepts and also the principles of elementary procedural programming based on the C Programming language. This module will introduce and develop the practical and professional skills required for designing and implementing C programs for a wide variety of applications.

Features: Not applicable

Educational aims: The aim of this module is to ensure that students are equipped with the necessary programming knowledge to undertake coding tasks encountered elsewhere in the programme.

Outline syllabus: Programming language principles

Sequence, selection, iteration

Data structures, pointers

Data-types, data manipulation

Development tools: Compilers, linkers

Specification and design techniques

Professional and legal issues: Ethics. Intellectual property. Product liability

Industry Standards for design, development and testing

Part 3: Teaching and learning methods

Teaching and learning methods: Learning material will be delivered though a set of lectures and structured laboratory exercises. Students will start from "step by step" laboratory exercises and progress to problem based learning culminating in design and implementation of a complete system. Accompanying lectures and tutorial sessions will present the formal aspects of the module.

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

MO1 Create appropriate software based solutions to a variety of mathematical and engineering problems.

MO2 Develop and document computer code to meet appropriate codes of practice and industry standards in relation to software development.

MO3 Apply fundamental programming principles and a system approach to the design, development and testing phases of software development.

MO4 Use a variety of information sources including technical literature to inform software development applications.

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/lists/0603024F-8707-BA62-9C8A-FEC843AFA9CF.html

Part 4: Assessment

Assessment strategy: Students complete a series of programming exercises while maintaining a digital logbook of exercises (Portfolio), as they are introduced the key building blocks of programming, such as loops, arrays and functions.

Students then bring together their learning of these programming principles to a Mini Coursework, where they keep a Development Log which evidences that they have followed industry practice of design documentation and evidence of testing (Report). The coursework is designed to assess a student's ability to integrate the building blocks of programming into a coherent and complex piece of software.

Their work is then assessed at the end of the module, via a demonstration and viva (Examination), which tests authorship and understanding of the code they have developed and allows students an opportunity to show what functionality and features they have developed.

This mode of assessment is designed to provide regular support and feedback as students develop their knowledge and skill in developing software, applying these skills to engineering applications, while ensuring they do so according to industry practices and documentation.

The resit assessment has the same profile as the first sit assessment.

Assessment tasks:

Portfolio (First Sit)
Description: Digital logbook entries of C-programming exercises
Weighting: 30 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1

Report (First Sit)
Description: A development log, containing design documentation and evidence of development & testing of a coursework programming task.
Weighting: 30 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2

Examination (First Sit)
Description: A demonstration and viva where the student will present the output of their mini coursework and are questioned on their mini coursework output.
This will last approximately 30 minutes per student and will be timetabled by the module team.
Weighting: 40 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO3, MO4

Portfolio (Resit)

Description: Digital logbook entries of C-programming exercises

Weighting: 30 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1

Report (Resit)

Description: A development log, containing design documentation and evidence of development & testing of a coursework programming task.

Weighting: 30 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2

Examination (Resit)

Description: A demonstration and viva where the student will present the output of their mini coursework and are questioned on their mini coursework output.

This will last approximately 30 minutes per student and will be timetabled by the module team.

Weighting: 40 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mechatronics {Apprenticeship-UCW} [UCW] FdSc 2023-24

Mechatronics Engineering [Frenchay] MEng 2023-24

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

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

Electronic and Computer Engineering {Apprenticeship-GLOSCOLL} [GlosColl] BEng (Hons) 2023-24

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

Robotics [Frenchay] BEng (Hons) 2023-24

Electronic and Computer Engineering [Frenchay] BEng (Hons) 2023-24

Electronic and Computer Engineering [GlosColl] BEng (Hons) 2023-24

Electronic Engineering {Foundation} [Frenchay] BEng (Hons) 2022-23

Robotics {Foundation} [Frenchay] BEng (Hons) 2022-23

Electronic Engineering [Sep][PT][Frenchay][6yrs] BEng (Hons) 2021-22