Module Specification

Embedded Systems

Version: 2025-26, v5.0, Approved

Contents

Part 1: Information

Module title: Embedded Systems

Module code: UFMF11-15-2

Level: Level 5

For implementation from: 2025-26

UWE credit rating: 15

ECTS credit rating: 7.5

College: College of Arts, Technology and Environment

School: CATE School of Engineering

Partner institutions: None

Field: Engineering, Design and Mathematics

Module type: Module

Pre-requisites: Programming for Engineers 2024-25

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: The module builds on prior knowledge covered in Year 1. Students will learn to design software and hardware subsystems which are commonly encountered in embedded system. A design project encompasses multiple subsystems.

Embedded Systems are integral to most high-tech hardware applications including automobile, aeroplanes, robotics, rail networks, communication devices. This module

teaches embedded systems hardware and software design for problems encountered in these applications.

Features: Not applicable

Educational aims: This module aims to develop the students understanding in embedded systems from the knowledge gained at level 4.
This module introduces the different subsystems for interfacing sensors and actuators, their programming and hardware interface. It further enhances the knowledge of embedded systems programming using a high-level language.

Outline syllabus: Bit banging using C/C++
Memories of micro-controllers
Analogue and digital subsystems of a micro-controller
Hardware interface for sensors and actuators
Software interface for micro-controller subsystems
Interrupt-driven programming
Modelling of behaviour of embedded systems
Verification tools and techniques

Part 3: Teaching and learning methods

Teaching and learning methods: The delivery is intended to ensure that students have opportunity to develop practical lab-based skills alongside theoretical understanding of embedded systems design principles through integrated theory and laboratory sessions.

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

MO1 Demonstrate the understanding of the subsystems' functionalities of an embedded system.

MO2 Apply quantitative methods, integrated development tools and transducers relevant to the design of embedded systems

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

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/048E4080-9C65-4D2C-095A-FA51F8A2E2F4.html

Part 4: Assessment

Assessment strategy: The assessment strategy recognises the fact that the module has many diverse topics requiring both, hardware and software design. It uses a portfolio approach whereby the students are required to complete a number of individual tasks that are centred around the input/output subsystems of typical embedded systems. The portfolio consists of a number of milestones of increasing complexity and scope.

The resit strategy uses the same approach with a portfolio of individual exercises.

Assessment tasks:

Portfolio (First Sit)
Description: Portfolio (1600 words)
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2

Portfolio (Resit)
Description: Portfolio (1600 words)
Weighting: 100 %
Final assessment: Yes
Group work: No

Learning outcomes tested: MO1, MO2

Part 5: Contributes towards

This module contributes towards the following programmes of study:

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

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

Electrical and Electronic Engineering [Frenchay] BEng (Hons) 2024-25

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

Electrical and Electronic Engineering [Frenchay] BEng (Hons) 2024-25

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