Module Specification

Practical Electronics

Version: 2024-25, v1.0, 03 May 2024

Contents

Part 1: Information

Module title: Practical Electronics

Module code: UFMEAH-30-1

Level: Level 4

For implementation from: 2024-25

UWE credit rating: 30

ECTS credit rating: 15

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: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module introduces students to basic applications of digital and analogue electronics encountered in Robotics and Mechatronics. Basic circuit elements, electronic devices and operational amplifiers and their applications are introduced. Combinational and sequential digital systems as well as finite state machines are covered. Simulation tools are used to verify theoretical calculations and the associated laboratory along with the introduction of standard test and

measurement equipment reinforces the lecture material. The module culminates in a project encompassing topics taught in the module.

Features: Not applicable

Educational aims: The aim of this module is to provide the technical underpinning for the design of digital and analogue electronic circuits, components and devices. The students will gain understanding of fundamental analogue and digital electronic concepts that are commonly applied in the design of more complex electronic systems encountered in Robotics and Mechatronics.

Outline syllabus: Indicative syllabus content:

Current, voltage, power, energy, impedance, serial and parallel configuration of resistors, capacitors, and inductors
RLC resonant circuits and passive filters
Basic operation and applications of active devices, such as diodes, BJTs, FETs, and OpAmps
Basic applications of combinational and sequential digital logic circuits, finite state machines
Use of digital electronic CAD tools for design and simulation of combinational and sequential logic circuits

Part 3: Teaching and learning methods

Teaching and learning methods: The module will be delivered using lectures to support smaller group laboratory and simulation group sessions.

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

MO1 Describe and explain the basic active and passive components of electronic circuits (A1 and B1) [US1]

MO2 Apply combinational and sequential logic design principles (A1 and B1) [US1m]

MO3 Demonstrate theoretical and practical knowledge through the design of electronic circuits and components (B1 and B2) [D1m]

MO4 Record and maintain effective experimental notes (B2) [P2 and P7]

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Laboratory work = 48 hours

Total = 300

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/FA935EB5-8CD9-27C5-4366-FCC4AF7BAEC1.html

Part 4: Assessment

Assessment strategy: Assessment of this module consists of four tasks:

Task 1 is delivered in Semester 1 and will take the form of multiple laboratory assignments completed at regular intervals during the semester. This is used to assess competency in the technical aspects of the module and provide feed forward preparation for the mid-year examination (Task 2). The coursework assessment regime has been devised to provide regular feedback and feed forward to assist students' progression in practical electronics.

Task 2 is an online examination at the end of Semester 1 and assesses the student's understanding of the range of fundamental concepts applied to practical problems.

Task 3 consists of a portfolio of laboratory assignments and self-study-time assignments that are regularly scheduled throughout the semester.

Task 4 is a Group poster developed during Project Week 2 which builds upon the knowledge and understanding gathered earlier.

Resit Strategy:
The resit strategy is the same as the first sit strategy

Assessment tasks:

Portfolio (First Sit)
Description: Portfolio consisting of individual and progressively more challenging design assignments and theoretical exercise problems
Weighting: 25 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO3

Examination (Online) (First Sit)
Description: Online exam (2 hour)
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO3

Laboratory Report (First Sit)
Description: multiple laboratory reports distributed throughout the semester
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO4

Poster (First Sit)
Description: Group poster
Weighting: 25 %
Final assessment: No

Group work: Yes
Learning outcomes tested: MO1, MO3

Poster (Resit)
Description: Group poster
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO3

Portfolio (Resit)
Description: Portfolio consisting of individual and progressively more challenging design assignments and theoretical exercise problems
Weighting: 25 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO3

Examination (Online) (Resit)
Description: Online exam (2 hour)
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO3

Laboratory Report (Resit)
Description: multiple laboratory reports distributed throughout the resit period
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mechatronics Engineering [Frenchay] MEng 2024-25

Mechatronics Engineering [Frenchay] BEng (Hons) 2024-25

Robotics [Frenchay] BEng (Hons) 2024-25

Mechatronics Engineering {Foundation} [Frenchay] MEng 2023-24

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

Robotics {Foundation} [Frenchay] BEng (Hons) 2023-24