Module Specification

Principles of Electrical Engineering

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Contents

Part 1: Information

Module title: Principles of Electrical Engineering

Module code: UFMFJT-30-1

Level: Level 4

For implementation from: 2021-22

UWE credit rating: 30

ECTS credit rating: 15

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: Auston Institute of Management, Singapore, Global College of Engineering and Technology (GCET), Gloucestershire College, University Centre Somerset, University Centre Weston

Delivery locations: Frenchay Campus, Gloucestershire College, University Centre Somerset, University Centre Weston

Field: Engineering, Design and Mathematics

Module type: Standard

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 delivers material on basic principles of electrical and electronic (EE) engineering. In order to develop an electronic engineering background, the module introduces the concepts and the scope of the principles.

The module develops mathematical concepts necessary to apply electrical principles to practical scenarios encountered in the laboratory.

The module ensures that theory and practice are integrated and experiments provide students with confidence in analysing and designing simple electrical and electronic circuits.

The module culminates in a project encompassing topics taught in the module.

Features: Not applicable

Educational aims: The aim of this module is to embed electrical and electronic principles considered essential to the practice of electronic engineering at the start of the curriculum.

Outline syllabus: A list of typical content coverage is given below:

Voltage and Current, AC, DC, Peak and RMS Values, forms of representation
Resistance, Conductors, Semiconductors, Insulators
Circuit laws and network theorems
Resistors, Capacitors and Inductors
Active Devices, basic operation of Diodes, BJTs, FETs, and OPAmps
Digital Principles, Basic Boolean Algebra, Basic gates, Truth tables, basic logic gate circuit analysis
Principles of Magnetism and Electromagnetic Theory
Basic Concepts of Electromagnetic Propagation and Antennas
Basic Concepts of Communication Engineering and Networks
Basic concepts of Transducers
Basic Understanding of Open-Loop and Closed-Loop Controllers and Systems
Simple Analysis of Linear Systems using Time and Frequency Domain
Basic Concepts of Electrical Machines and Supply Systems
Basic A/D and D/A Conversion

Part 3: Teaching and learning methods

Teaching and learning methods: In order to develop the underpinning knowledge for electrical and electronic engineering, the module introduces the concepts and the scope of the principles through lectures. These will be supported by directed reading, tutorial exercises, practical and simulation laboratory-based works.

Module Learning outcomes:

MO1 Clearly describe and explain basic principles of electrical engineering.

MO2 Analyse and interpret, using a variety of techniques, the characteristic behaviour of simple electric, magnetic and electronic circuits.

MO3 Design and implement circuits on breadboard, PCB and simulation software

MO4 Record clear, concise and accurate experimental notes.

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 128 hours

Laboratory work = 48 hours

Total = 200

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/ufmfjt-30-1.html

Part 4: Assessment

Assessment strategy: In this module we are developing the theory and practice that underpin Electronic Engineering and are providing practical experiences that allow students to bring theory and practice together. The laboratory reinforces the material learned in the lecture sessions.

The assessment is designed so that students build their understanding and

confidence in applying engineering principles as they progress through the course. The assessment takes the form of 4 lab-based activities where students complete an experimental task followed by a written summary. The tasks will increase in complexity which will be represented by the weighting of each assessment. Each assessment will be completed within a two hour window.

The resit assessment will consist of a single three hour lab-based assessment where students demonstrate understanding of experiment, simulation and analysis from across the module content.

Assessment components:

Portfolio - Component A (First Sit)
Description: Consists of 4 lab-based assessments held throughout the year where students complete experimental work followed by a written assessment. Each assessment will be conducted in a two hour window will be of increasing complexity as the module progesses

Assessment 1: 10%
Assessment 2: 20%
Assessment 3: 30%
Assessment 4: 40%
Weighting: 100 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Portfolio - Component A (Resit)
Description: Consists of a single three hour lab-based exam where students demonstrate understanding of experiment and analysis of electrical engineering principles.
Weighting: 100 %
Final assessment: No
Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electronic Engineering {Foundation Year} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2020-21

Electronic Engineering {Foundation Year} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2020-21

Electronic Engineering [Sep][PT][Frenchay][6yrs] BEng (Hons) 2020-21