



Module Specification

Principles of Electrical Engineering

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Part 1: Information

Module title: Principles of Electrical Engineering

Module code: UFMFJT-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: Gloucestershire College, University Centre Weston

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 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

Principles of Magnetism and Electromagnetic Theory

Basic Concepts of Electromagnetic Propagation and Antennas

Basic Concepts of Communication Engineering and Networks

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

AC Fundamentals and Complex Numbers

Polyphase Circuits

Power system engineering: AC and DC Transmission and Distribution Systems

Single and three phase Transformer

Electric Heating

Electrical Instruments and Measurements

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: On successful completion of this module students will achieve the following 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](https://uwe.rl.talis.com/modules/ufmfjt-30-1.html) 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 Electrical and 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 :

Two online exams:

Ex 1 at the end of first term and

Ex 2 at the end of second term

assess conceptual understanding, analysis and design skills .

Two online submissions of lab-based activities:

CW1: toward the end of first term

CW2: toward the end of second term

where students complete the experimental tasks followed by a written summary.

These tasks will assess design and implementation skills.

Resit is the same as the first sit

Assessment tasks:

Examination (Online) (First Sit)

Description: Online Exam 1:

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2

Laboratory Report (First Sit)

Description: Consists of lab-based activities: Online CW1 submission of the lab summary and reflective written report held at the end of the first term.

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO3, MO4

Examination (Online) (First Sit)

Description: Online Exam 2

Weighting: 25 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2

Laboratory Report (First Sit)

Description: Consists of lab-based activities: Online CW2 submission of the lab summary and reflective written report held at the end of the second term.

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO3, MO4

Examination (Online) (Resit)

Description: Online Exam 1

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2

Laboratory Report (Resit)

Description: Consists of lab-based activities: Online CW1 submission of the lab summary and reflective written report.

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO3, MO4

Examination (Online) (Resit)

Description: Online Exam 2

Weighting: 25 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2

Laboratory Report (Resit)

Description: Consists of lab-based activities: Online CW2 submission of the lab summary and reflective written report.

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electronic and Computer Engineering {Apprenticeship-GLOSCOLL} [GlosColl] BEng (Hons) 2024-25

Electronic and Computer Engineering [GlosColl] BEng (Hons) 2024-25

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

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

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

Electronic and Computer Engineering {Apprenticeship-GLOSCOLL} [GlosColl] BEng (Hons) 2024-25

Mechatronics {Apprenticeship-UCW} [UCW] FdSc 2024-25

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

Electronic and Computer Engineering [GlosColl] BEng (Hons) 2024-25

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

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

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

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

