

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: 2025-26

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.

Page 2 of 6 09 May 2025 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

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 128 hours

Laboratory work = 48 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link <u>https://uwe.rl.talis.com/modules/ufmfjt-</u><u>30-1.html</u>

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 :

Page 4 of 6 09 May 2025 TB1:

A portfolio consisting of multiple distributed milestones that assesses students understanding of the theoretical aspects of Electrical Engineering principles and their ability to apply those theoretical understanding to practical implementations.

TB2:

A laboratory exam that assesses the application of the TB2 material.

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Assessment tasks:

Portfolio (First Sit)

Description: A portfolio consisting of several milestones of increasing complexity and scope (20 pages max) Weighting: 50 % Final assessment: No Group work: No Learning outcomes tested: MO1, MO3

Examination (First Sit) Description: Laboratory Exam (4 hours) Weighting: 50 % Final assessment: Yes Group work: No Learning outcomes tested: MO2, MO3

Portfolio (Resit)

Description: A portfolio of several milestones of increasing complexity and scope (20 pages max)

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Weighting: 50 % Final assessment: No Group work: No Learning outcomes tested: MO1, MO3

Examination (Resit)

Description: Laboratory Exam (4 hours) Weighting: 50 % Final assessment: Yes Group work: No Learning outcomes tested: MO2, MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study: Electrical and Electronic Engineering [Foundation} [Frenchay] BEng (Hons) 2024-25 Electrical and 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) 2025-26 Electronic and Computer Engineering [GlosColl] BEng (Hons) 2025-26 Electronic and Computer Engineering [Frenchay] BEng (Hons) 2025-26 Electronic and Computer Engineering [Frenchay] BEng (Hons) 2025-26 Electrical and Electronic Engineering [Frenchay] BEng (Hons) 2025-26