Module specification

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Refer to the module guidance notes for completion of each section of the specification.

Module code	ENG429
Module title	Electrical Engineering Science
Level	4
Credit value	20
Faculty	FAST
Module Leader	Mr A Sharp
HECoS Code	100164
Cost Code	GAME

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
HNC Electrical & Electronic Technology	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	60 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	**60** hrs
Placement / work based learning	0 hrs
Guided independent study	140 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	August 2016
With effect from date	September 2021

Date and details of revision	6 July 2021, revalidated
Version number	Version 2

Module aims

To develop knowledge and understanding of the engineering science principles encountered in electrical engineering and at the electro-mechanical interface.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Apply knowledge to solve problems in series a.c. circuits using j operator
2	Investigate the use of reciprocity in the solution of parallel a.c. circuit problems.
3	Apply knowledge to solve problems relating to inductively coupled circuits.
4	Investigate the applications of d.c. transients.
5	Apply knowledge to convert AND,OR and NOT combinations into both NAND and NOR equivalents
6	Investigate the applications of D-A and A-D convertors

Assessment

Indicative Assessment Tasks:
This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Assessment is 100% in-course.

Assessment One: Outcomes 1, 2, 3 & 4 would be assessed using an in-class test based on a case study covering single phase a.c. theory (1hr 30min).

Assessment Two: Outcomes 5, 6 would be assessed using a report which asks students to apply knowledge of convertors to practical problems (2000 words).

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1, 2, 3, 4	In-class test	50%
2	5, 6	Coursework	50%

Derogations

None

Learning and Teaching Strategies

The module will be presented to students through a specified series of lectures assisted by notes via VLE platform. Lectures will deliver key concepts, ideas, and theories underpinned with numerical examples of ascending levels of complexity.

Indicative Syllabus Outline

1. **Single phase a.c. theory:** non-resonant ccts using equivalent impedance and admittance methods series and parallel models. Current flow and potential difference, power factor, true, reactive and reactive power. Resonant circuits, definition of circuit resonance and conditions at resonance both series and parallel. Q-factor and dynamic impedance. Power factor correction. Complex waveforms; synthesis using graphical methodologies.
2. **Information and energy control systems**: . Information systems, block diagram of typical information system such as audio comms, instrumentation, process monitoring, qualitative description of signal paths, also of transducer principles. Boolean algebra and its application to combinational logic. Sequential logic and its applications, A to D and D to A converters.

Indicative Bibliography:

Essential Reads

Bird, J. (2017) Electrical Circuit Theory and Technology. 6th ed. Routledge

Bird, J. (2017) Electrical and Electronic Principles and Technology.6th ed. Routledge

Other indicative reading

Tooley M., Dingle L. (2004) Higher National Engineering. Routledge.

Tooley M., Dingle L. (2020) Engineering Science: For Foundation Degree and Higher National. 2nd ed. Routledge

Employability skills – the Glyndŵr Graduate

Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas. Click here to read more about the Glyndwr Graduate attributes

Core Attributes
Engaged
Creative
Ethical

Key Attitudes
Curiosity
Confidence
Resilience

Adaptability

Practical Skillsets
Digital Fluency
Critical Thinking
Communication