Module specification

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Module Code	ENG790
Module Title	Circuit Design Analysis and Testing
Level	7
Credit value	20
Faculty	Art Science and Technology
HECoS Code	100163
Cost Code	GAME

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
MSc Engineering (Electrical & Electronic) MSc Engineering (Electrical & Electronic) with Advanced Practice MEng Electrical & Electronic Engineering	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	25 hrs
Placement tutor support	0 hrs
Supervised learning e.g., practical classes, workshops	5 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	**30** hrs
Placement / work-based learning	0 hrs
Guided independent study	170 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	22nd Aug 2022
With effect from date	Sept 2022
Date and details of revision	
Version number	1

Module aims

- To enable students to have a critical awareness of the interrelationships of design and testing within the product life cycle of electronic products.
- To enable students to develop optimal test strategies by analysing circuits and considering the various testing methods used in the electronic industry.

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

In addition to the module learning outcomes, students will also cover the following accreditation of higher education programme (AHEP) fourth edition learning outcomes: **M1, M2,** & **M5**

1	Demonstrate a critical awareness of the factors effecting cost effectiveness, sustainability, ethical considerations, and new developments in the context of electronic design and manufacture.
2	Analyse complex electronic circuit designs in order to determine circuit parameters and performance.
3	Establish the optimum test methodology for different circuit designs.

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 One: A time constrained examination covering all learning outcomes. Analytical and descriptive problem-based questions proposed, the student will not have the choice in the questions to be answered to fully assess the whole learning outcomes. Assessment one is a written examination (3 hrs.) and represents 100% of the overall module mark.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1-3	Examination	100%

Derogations

A derogation from regulations has been approved for this programme which means that whilst the pass mark is 50% overall, each element of assessment (where there is more than one assessment) requires a minimum mark of 40%.

Learning and Teaching Strategies

A series of workshop style lectures with student-led seminars and small group activities. Directed learning using library and internet resources will be facilitated using Moodle and MS Teams. This module will also follow the ALF (Active Learning Framework) guidelines, which will include alternative methods of assessment and a blended approach to delivery, with some theory and software sessions being delivered online (depending on requirements and student experience).

Indicative Syllabus Outline

Testing methodology

- Manual Testing Methodology
- Automated Testing Methodology
- Test pattern Generation and minimal test algorithms
- Testability measures
- Derivation of Test limits

Design for testability

- Design Analysis
- Design and Testing in the product life cycle
- Reliability and maintainability considerations
- Sustainability and Ethical considerations in electronic design and manufacture

Indicative Bibliography:

Essential Reads

E, Hughes, et. al., *Hughes Electrical and Electronic Technology*. 12th ed. Pearson, 2016.

All the course material for this module will be provided and published on the VLE

Other indicative reading

Plus, various others to be signposted on Moodle.

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.

Core Attributes
Engaged

Enterprising
Creative
Ethical

Key Attitudes
Commitment
Curiosity
Resilience
Confidence
Adaptability

Practical Skillsets
Digital Fluency
Organisation
Critical Thinking
Emotional Intelligence
Communication