Module specification

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Module Code	ENG5B9
Module Title	Research Methodologies
Level	5
Credit value	20
Faculty	FAST
HECoS Code	100184
Cost Code	GAME

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
WGU Summer School aligned to BEng (Hons) Electrical and Electronic Engineering for QA and assessment purposes	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	30 hrs
Supervised learning e.g., practical classes, workshops	0 hrs
Total active learning and teaching hours	30 hrs
Guided independent study	170 hrs
Module duration (total hours)	200 hrs

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Initial approval date	18/05/2023
With effect from date	18/05/2023
Date and details of revision	
Version number	1

Module Aim

The aim of this module is to build up skills of research and development related to engineering, computing, science, and technology in students. This module will make the students capable of effectively studying and proposing solutions to various engineering, computing, science and technical problems.

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

1	Explain with the aid of practical examples the fundamentals and importance of research and its role in the development of a society.
2	Select and evaluate technical literature and other sources of information to address complex problems.
3	Write a feasible project proposal with evidence of motivation, research problem, possible solutions, literature review, methodology, project timeline, ethical and financial aspects.

Assessment

Indicative Assessment Tasks:

This module will be assessed by means of producing a research proposal (2500 words). The research proposal will mainly include introduction, motivation, problem statement, literature survey, aims & objectives, methodology and project timeline/Gantt chart, etc. The assessment will cover all learning outcomes.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1, 2, 3	Written Assignment	100%

Derogations

N/A

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

Fundamentals of Research: Definition of research, search vs. research, importance of research, types of research, research in STEM, problem study, intellectual property rights, research ethics, practical case studies and examples of successful research projects.

Literature Survey: Definition of literature, types of literature, various sources of literature, steps to carry out a literature survey, survey papers, analysis, and comparison.

Research Paper: Definition of a research paper, types of research papers, structure of a research paper, importance of abstract, types of referencing, various research journals,

renowned publishers, Q-factor, Scopus Indexing, Citation factors, i-index and H-index, Google Scholar, ORCID, submission guidelines, APC, reviewing and publication.

Research Proposal: What is a research proposal, structure of a research proposal, methodology, Gantt chart, an effective research proposal, funding organisations, repository, review stages and acceptance.

Indicative Bibliography:

Essential Reads

Thiel, D.V. (2014) Research Methods for Engineers. Cambridge: Cambridge University Press

Other indicative reading

B. Allison, P. Race, *The Student's Guide to Preparing Dissertations and Theses.* 1st Edition. London UK: Routledge, 2004.

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
Creative
Ethical

Key Attitudes
Commitment
Confidence
Adaptability

Practical Skillsets
Digital Fluency
Organisation
Critical Thinking
Communication