

Module specification

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

Module code	ENG4AP
Module title	Introduction to Composites - Theory
Level	4
Credit value	10
Faculty	FAST
Module Leader	Martyn Jones
HECoS Code	101217
Cost Code	GAME

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
Standalone module aligned to BEng(Hons) Aerospace and Mechanical Engineering	Stand alone

Pre-requisites

N/A

Breakdown of module hours

Learning and teaching hours	12 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	12 hrs
Placement / work based learning	0 hrs
Guided independent study	88 hrs
Module duration (total hours)	100 hrs

For office use only	
Initial approval date	03/03/21
With effect from date	01/06/21

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Date and details of revision	
Version number	1

Module aims

This short course aims to:

- deliver an overview of the history of composite materials in aerospace and automotive industry
- introduce the different types of composite materials available
- identify what the different types of matrix and fibre materials are used in modern engineering
- understand the benefit of using composite materials over traditional metallic materials.

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

1	Explain the different types of fibres and matrix material used in engineering components
2	Describe the benefits of using polymer composites in engineered structures
3	Identify the issues in handling and processing polymer composites

Assessment

Indicative Assessment Tasks:

Students will be asked to demonstrate their knowledge and understanding of the learning outcomes via a multi-choice question paper

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1,2,3	In-class test	100

Derogations

None

Learning and Teaching Strategies

- The module will be delivered through a combination of formal lectures, tutorials, practical demonstrations and student workshops. All of the material delivered formally will be made available to participants through MOODLE or other sharing platforms

Indicative Syllabus Outline

1. Introduction to the course
2. Overview of different composites types (polymer, ceramic and metallic matrix)
3. Fibre materials and their architectures
4. Thermoplastic polymers
5. Thermo setting polymers
6. Manufacturing polymer composites
7. Issues in manufacture
8. Handling, fabrication, and damage in composites

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads

Callister, W.D. (2020) Material Science and Engineering An introduction, Wiley (New York).

Other indicative reading

Potter, K. (1997) An introduction to composite products, design, development and manufacture, Chapman & Hall.

Hull, D. and Clyne, T.W. (1996) An introduction to composite materials. 2nd ed. Cambridge: Cambridge University Press.

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

Key Attitudes

Commitment
Confidence
Curiosity
Resilient
Adaptability

Practical Skillsets

Critical Thinking
Leadership & Team working
Communication