Module Specification

Composite Engineering

Version: 2026-27, v5.0, Approved

Contents

Part 1: Information

Module title: Composite Engineering

Module code: UFMFU6-15-3

Level: Level 6

For implementation from: 2026-27

UWE credit rating: 15

ECTS credit rating: 7.5

College: College of Arts, Technology and Environment

School: CATE School of Engineering

Partner institutions: None

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 assesses the individuals core knowledge of composite materials through a series of e-assessments. This is supported by a group assignment that allows students to develop a deep understanding of the structure and performance of composite materials. They will manufacture samples and then test them to measure their mechanical properties. The students use theoretical approaches to predict the performance of these materials and then compare their theoretical and actual test results to enable them to understand and evaluate the

difficulties with predicting the performance of composite materials. The students will also explore design solutions using composite materials to critically analyse their performance, developing their own analysis tools. They will then appraise the performance of their designs and discuss key conflicts with regard to sustainability, recyclability and manufacturing.

Features: Not applicable

Educational aims: The module aims to provide a rounded understanding of composite engineering (design, manufacture and performance) relevant to industry practice and requirements.

Outline syllabus: Topics covered are likely to cover but not limited to:

Fundamentals of composites;
Basic analysis techniques;
Composite failure;
Classical laminate analysis;
Composite manufacturing techniques;
Quality Assurance and non-destructive testing;
Development areas, reuse, and sustainability.

Part 3: Teaching and learning methods

Teaching and learning methods: Lecture style sessions support laboratory work-based learning where students are able to explore the structural properties of composite materials and to compare test results to theoretical predictions and appreciate the inherent link between manufacturing process and structural performance.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Understand the fundamental differences between composites and traditional materials, including constituent properties, manufacturing processes, mechanical performance and its validation.

MO2 Create optimal composite designs, reflecting on the limitations and uncertainties of analysis techniques, experimental validation, and manufacturability.

MO3 Critically analyse the inter-relationship between a composite material's properties, manufacturing process, quality and cost,, reflecting on performance, sustainability & recyclability.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/modules/ufmfu6-15-3.html

Part 4: Assessment

Assessment strategy: The module is assessed via individual E-Tests (20%) and a Group presentation (80%)

E-Tests cover the fundamentals of composites and the application of basic analysis techniques to obtain mechanical properties and the provided CLA toolbox.

The group assignment is integrated into weekly tutorials covering the manufacture and test of composite samples, as well as the creation and critical analysis of a manufacturable composite design to ensure optimised performance. This is assessed via 30-minute group Presentation + Question/Answer. A peer assessment is used to adjust group marks to obtain individual contributions.

The resit assessment strategy is the same as the first sit assessment.

Resit deliverable(s) will be scaled appropriately to group size and task complexity

Assessment tasks:

Presentation (First Sit)
Description: Presentation that addresses design, manufacture and test of composites (30 mins).

Peer review to analyse individual contributions.
Weighting: 80 %
Final assessment: No
Group work: Yes
Learning outcomes tested: MO2, MO3

Online Assignment (First Sit)
Description: E-Learning assignments on the fundamentals of composite materials.
Weighting: 20 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1

Presentation (Resit)
Description: Presentation that addresses design, manufacture and test of composites (30 mins).

Peer review to analyse individual contributions.

Resit deliverable(s) will be scaled appropriately to group size and task complexity
Weighting: 80 %
Final assessment: No
Group work: Yes
Learning outcomes tested: MO2, MO3

Online Assignment (Resit)
Description: E-Learning assignments on the fundamentals of composite materials.
Weighting: 20 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electro-mechanical Engineering {Apprenticeship-UCW}[UCW] BEng (Hons) 2023-24

Aerospace Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2023-24

Aerospace Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2024-25

Aerospace Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2023-24

Aeronautical Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2024-25

Aerospace Engineering {Apprenticeship-UCW} [UCW] - WITHDRAWN BEng (Hons) 2024-25

Aeronautical Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2024-25

Electro-mechanical Engineering {Apprenticeship-UCW}{Top-Up}[Frenchay] BEng (Hons) 2025-26

Aerospace Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Mechanical Engineering [Frenchay] BEng (Hons) 2023-24

Mechanical Engineering [Frenchay] MEng 2023-24

Automotive Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Automotive Engineering [Frenchay] BEng (Hons) 2023-24

Automotive Engineering [Frenchay] MEng 2023-24

Aerospace Engineering with Pilot Studies {Foundation} [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering with Pilot Studies [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2023-24

Aerospace Engineering [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering [Frenchay] MEng 2023-24

Mechanical Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering [Frenchay] BEng (Hons) 2024-25

Aerospace Engineering [Frenchay] MEng 2024-25

Aerospace Engineering with Pilot Studies [Frenchay] BEng (Hons) 2024-25

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2024-25

Aerospace Engineering {Apprenticeship-UWE} [UCW] BEng (Hons) 2024-25

Mechanical Engineering with Manufacturing {Apprenticeship-UWE} [UCW] BEng (Hons) 2024-25

Mechanical Engineering [Frenchay] BEng (Hons) 2024-25

Mechanical Engineering [Frenchay] MEng 2024-25

Automotive Engineering [Frenchay] BEng (Hons) 2024-25

Automotive Engineering [Frenchay] MEng 2024-25

Automotive Engineering [Frenchay] MEng 2023-24

Automotive Engineering [Frenchay] - WITHDRAWN MEng 2024-25

Aerospace Engineering [Frenchay] MEng 2023-24

Aerospace Engineering [Frenchay] MEng 2024-25

Automotive Engineering [Frenchay] BEng (Hons) 2023-24

Automotive Engineering [Frenchay] BEng (Hons) 2024-25

Automotive Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering [Frenchay] BEng (Hons) 2024-25

Aerospace Engineering {Apprenticeship-UWE} [UCW] BEng (Hons) 2024-25

Aerospace Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering with Pilot Studies [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering with Pilot Studies [Frenchay] BEng (Hons) 2024-25

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2023-24

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2024-25

Aerospace Engineering with Pilot Studies {Foundation} [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering {Apprenticeship-UWE} [UCW] BEng (Hons) 2024-25

Mechanical Engineering and Technology {Foundation} [GCET] BEng (Hons) 2022-23

Mechanical Engineering and Technology {Foundation} [GCET] BEng (Hons) 2023-24

Mechanical Engineering with Manufacturing {Apprenticeship-UCW} [UCW] BEng (Hons) 2024-25

Mechanical Engineering and Technology (Manufacturing) {Foundation} [GCET] BEng (Hons) 2023-24

Aerospace Engineering {Apprenticeship-UWE} [UCW] BEng (Hons) 2024-25

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2023-24

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2024-25

Aerospace Engineering [Frenchay] MEng 2023-24

Aerospace Engineering [Frenchay] MEng 2024-25

Mechanical Engineering [Frenchay] MEng 2022-23

Mechanical Engineering [Frenchay] MEng 2023-24

Mechanical Engineering {Apprenticeship-GlosColl} {Top-Up} [Frenchay] BEng (Hons) 2026-27

Mechanical Engineering {Apprenticeship-UCS} {Top-Up} [Frenchay] BEng (Hons) 2026-27

Mechanical Engineering {Apprenticeship-UCW} {Top-Up} [Frenchay] BEng (Hons) 2026-27

Mechanical Engineering [Frenchay] MEng 2024-25

Mechanical Engineering [Frenchay] MEng 2022-23

Mechanical Engineering [Frenchay] BEng (Hons) 2022-23

Automotive Engineering {Foundation} [Frenchay] BEng (Hons) 2022-23

Aerospace Engineering {Foundation} [Frenchay] BEng (Hons) 2022-23

Aerospace Engineering with Pilot Studies {Foundation} [Frenchay] BEng (Hons) 2022-23

Mechanical Engineering {Foundation} [Frenchay] BEng (Hons) 2022-23

Mechanical Engineering and Technology {Foundation} [GCET] BEng (Hons) 2023-24

Mechanical Engineering and Technology (Vehicle Technology) {Foundation} [GCET] BEng (Hons) 2023-24

Mechanical Engineering and Technology (Manufacturing) {Foundation} [GCET] BEng (Hons) 2023-24