



Module Specification

Aero Structures

Version: 2026-27, v5.0, Approved

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Part 1: Information

Module title: Aero Structures

Module code: UFMFVU-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: Structural Mechanics 2025-26

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: The module provides a solid foundation for the design, analysis and evaluation of aircraft structures covering several aspects related to the structural analysis of aircraft structures. The module therefore provides fundamental knowledge that is essential to the role of the structural engineer and supports the application of engineering design principles and analysis at higher levels.

Features: Not applicable

Educational aims: The aim of this module is to provide fundamental concepts of solid mechanics of materials, stress analysis, idealisation methods and shear flows used in the analysis of aircraft structures.

Outline syllabus: Un-symmetric bending of thin walled structures.

Shear of single and multi-cellular thin walled structures.

Torsion of single and multi-cellular thin walled structures.

Analysis of bolted metallic structures.

Structural idealisation.

Buckling of columns.

Buckling of panels.

The concept of safety factors in aircraft design.

Fatigue life calculation of structures.

Part 3: Teaching and learning methods

Teaching and learning methods: We will focus on applications on aircraft analysis such as wing boxes and fuselage and dimension components for fatigue life and design plates for buckling analysis of some important aircraft components such as spars and skin panels.

The module involves extensive comprehension of stress analysis. Hence, possessing a sound understanding of concepts within the realm of theory of linear elasticity such as stress/strain, principal stresses/strains and Mohr's circle is imperative.

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

MO1 Describe and explain in detail key theoretical principles and results for the analysis of aero structures.

MO2 Develop appropriate models and solve a range of real aero structures problems.

MO3 Independently research a range of literature resources in order to investigate and solve more complex problems in aero-structures; including the selection and application of appropriate mathematical techniques to analyse the structural design of real aircraft.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Lectures = 12 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link

Part 4: Assessment

Assessment strategy: The assessment strategy is designed to ensure that students demonstrate a secure understanding of structural analysis principles and can apply this knowledge to problems encountered in aerospace applications.

Assessment for this module follows a portfolio-based approach, consisting of a set of online questions to be completed after each topic. The questions are primarily calculation-based, requiring students to submit numerical values for the specified parameters. All questions are completed individually and must be submitted within the designated timeframe following completion of each topic.

For resit assessments, the same portfolio-based strategy will be applied.

Assessment tasks:**Portfolio (First Sit)**

Description: Online questions per topic.

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

Portfolio (Resit)

Description: Online questions per topics.

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study:

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

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

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

Aerospace Engineering [Frenchay] MEng 2023-24

Aerospace Engineering [Frenchay] MEng 2024-25

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

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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

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

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

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)
2022-23

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

Aerospace Engineering [Frenchay] MEng 2023-24

Aerospace Engineering [Frenchay] MEng 2024-25

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

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

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

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