



Module Specification

Aircraft Structural Design

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Part 1: Information

Module title: Aircraft Structural Design

Module code: UFMEWB-15-M

Level: Level 7

For implementation from: 2021-22

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Delivery locations: Frenchay Campus

Field: Engineering, Design and Mathematics

Module type: Standard

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Module Entry requirements, the module is intended for science and engineering graduates, or equivalent, with strong mathematical skills.

Features: Not applicable

Educational aims: See learning outcomes.

Outline syllabus: Design requirements, airworthiness, aircraft loading actions.

Fatigue and damage considerations, safe life, fail safe and damage tolerant design philosophies.

Materials selection for strength and stiffness, joining methods and design for manufacture issues.

Aircraft Construction: - Layout, configuration and roles of structural members elements and layout, jointing, design for manufacture.

Design Analysis: - Basic material and stress data, buckling, postbuckling of compression and shear members, bending and torsion of thin-walled box beam structures to meet required strength and stiffness limitations, detail stressing.

Part 3: Teaching and learning methods

Teaching and learning methods: Lectures will introduce the general theoretical concepts and present examples in the use of these techniques.

Further learning will take place through discussion groups, case studies and tutorials.

Students will be expected to learn independently and carry out reading and directed study beyond that available in taught classes.

Module Learning outcomes:

MO1 Airframe design philosophies, design criteria and requirements

MO2 Material properties and design for manufacturing issues

MO3 The external loads acting on aircraft

MO4 The layout, configuration and roles of structural members

- MO5** The evaluation and implementation of solutions to airframe design problems
- MO6** The theories, methods and analysis tools used in the design of airframes and sizing of members
- MO7** The derivation of net airframe loads from given external loading actions
- MO8** The design, layout and preliminary sizing of primary structural elements and members
- MO9** The detail stress analysis of structural members
- MO10** Awareness of professional literature
- MO11** Problem formulation and decision making [
- MO12** Progression to independent learning
- MO13** Self-management skills

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ufmewb-15-m.html) via the following link <https://uwe.rl.talis.com/modules/ufmewb-15-m.html>

Part 4: Assessment

Assessment strategy: The module is examined via an exam of 3 hours which will cover the taught issues.

Assessment components:

Examination (Online) - Component A (First Sit)

Description: Online examination

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO10, MO11, MO12, MO13, MO2, MO3, MO4, MO5, MO6, MO7, MO8, MO9

Examination (Online) - Component A (Resit)

Description: Online examination

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested:

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Aerospace Engineering (Design) [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies (Design) [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19