MODULE SPECIFICATION

Part 1: Information			
Module Title	Aero Structures		
Module Code	UFMFVU-15-3	Level	Level 6
For implementation from	2022-23		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	
Department	FET Dept of Engineering Design & Mathematics		
Module Type:	Standard		

Pre-requisites	Structural Mechanics 2021-22
Excluded Combinations	None
Co-requisites	None
Module Entry Requirements	None
PSRB 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.

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.

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.

Part 3: Assessment

The assessment strategy is designed to ensure that students demonstrate secure knowledge of structural analysis principles and are able to apply that knowledge to problems that would be encountered in aerospace applications.

Component B involves a team-based coursework focusing on application of the theory. The output from the assessment task will be a 12 page group report. The group mark for the report will be moderated by a peer review process in accordance with the Department Group Work Policy.

Component A will consist of a 2 hour written exam to test understanding of underlying concepts and principles under controlled conditions.

The resit assessment strategy differs from the first sit assessment in that component B will involve a design and analysis task that will result in a 3 page individual report.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	50 %	Written open book examination (2 hours)
Report - Component B		50 %	12 page group report
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	50 %	Written open book exam (2 hours)
Report - Component B		50 %	3 page individual report

Part 4: Teaching and Learning Methods

Learning Outcomes

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

Module Learning Outcomes	**Reference**
Describe and explain in detail key theoretical principles and results for the analysis of aero structures (SM1b, SM2b)	MO1

	Develop appropriate models and solve a range of real aero structures problems (EA1b, EA2, EA3b)	MO2
	Independently research a range of literature resources to investigate and solve more complex problems in aero-structures (EA1b, EA2, EA3b, G1, G4)	MO3
	Select and apply appropriate mathematical techniques to analyse the structural design of real aircraft (EA1)	MO4

Contact Hours		
	Independent Study Hours:	
	Independent study/self-guided study	114
	Total Independent Study Hours:	114
	Scheduled Learning and Teaching Hours:	
	Lectures	12
	Tutorials	24
	Total Scheduled Learning and Teaching Hours:	36
	Hours to be allocated	150
	Allocated Hours	150

Reading List	
	The reading list for this module can be accessed via the following link: https://rl.talis.com/3/uwe/lists/DDDAE895-EFCE-8175-4803-980DEE4843DA.html?draft=1&lang=en-US&login=1

Part 5: Contributes Towards
This module contributes towards the following programmes of study: Aerospace Engineering {Apprenticeship} [Sep][FT][UCW][3yrs] BEng (Hons) 2020-21 Aerospace Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2020-21 Aerospace Engineering [Sep][FT][Frenchay][4yrs] MEng 2020-21 Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][3yrs] BEng (Hons) 2020-21 Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][4yrs] MEng 2020-21