MODULE SPECIFICATION

Part 1: Information			
Module Title	Aerospace Systems Design		
Module Code	UFMFSU-15-2	Level	Level 5
For implementation from	2021-22		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engineering Design & Mathematics		
Module Type:	Standard		

Pre-requisites	None
Excluded Combinations	None
Co-requisites	None
Module Entry Requirements	None
PSRB Requirements	None

Part 2: Description

Overview: The module provides a first introduction to aerospace systems engineering from a preliminary design standpoint. The content will encompass broad aspects of the modern aerospace vehicle engineering using a systematic model-based approach.

A typical commercial aerospace vehicle contains a series of complex interacting systems in order for it operate safely, reliably and efficiently. These systems involve the integration of technology from different disciplines such as aerospace, electronic, mechanical engineering and computing. In this module we show how such systems may be designed using a systematic methodological approach taking our examples from real aerospace vehicles.

Throughout the module students will work in design teams towards the documentation and demonstration of a validated design of a typical aerospace systems design problem.

Educational Aims: To provide the background necessary to understand multidisciplinary and deeply integrated systems of modern aerospace vehicles and is required for the study of this subject at a higher level in the programme.

Outline Syllabus: Outline Syllabus

Model Based Systems Engineering (MBSE)
Iteration based design cycle

Requirements analysis
Conceptual design and Concept of Operation
Systems architecture
Interfaces and systems interactions
Verification and validation
Flight safety and Reliability
Sustainability
Introduction to certification, operation, and maintenance

The module will consider multidisciplinary and intricate systems such as avionics, the aircraft fuel management system, the undercarriage, the platform or the payload.

Teaching and Learning Methods: The module delivery is design to support students creating valid designs to complex systems problems present in aerospace vehicles using a systematic model-based approach.

To achieve this objective the design concepts, systems thinking and solution methods will be presented in lectures with real aerospace scenarios to motivate and make clear the connection between theory and practice. The material will then be explored in depth and discussed in small groups in tutorials and practical modelling and simulation labs.

Part 3: Assessment

The assessment strategy is design to allow students to follow the design process as part of a design team working in an aerospace environment.

The computer-based design solution will be developed during the module with the different stages of the methodological approach supported by the weekly delivery of material with students working in groups in tutorial and computer based workshops.

Component B will be a 3500 word group report that documents the design solution and process.

This is followed by Component A where each group will demonstrate their solution and answer individual questions.

The group marks will be moderated using a peer review process as set out in the Departmental Group Work Policy.

The resit assessment will follow the same format as above but with the report (1500 words) and the demonstration both being individual tasks.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		60 %	Group report on design task (3500)
Presentation - Component A	✓	40 %	Group demonstration of design solution as a computer simulation model with individual questions (20 minutes total – 8 minute presentation, 12 minutes Q&A)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		60 %	Individual report on design task (1500)
Presentation - Component A	✓	40 %	Individual demonstration of the computer simulation model and questions (12 minutes)

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
Define appropriate design concepts to capture the requirements and constraints specified in the design of a complex system typical of aerospace vehicles. (D1, D2, D3b, D4, D5, EA4m, EL1m, EL3m, P1, P2m, P8m, P9m, P10m, SM3m)	MO1
Create, analyse and validate an appropriate systems architecture that provides the framework for solution development. (D6, EA2, EA3m, EA4m)	MO2
Develop an appropriate computer-based model of the system architecture. (D4, D5, D6, EA1m, EA2, EA3m)	MO3
Demonstrate and evaluate the performance of the system design against requirements and constraints. (D4, EA1m, EA2, EL2, EL4, G1, G4, P5, P6, P7)	MO4

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	114
Total Independent Study Hours:	114
Scheduled Learning and Teaching Hours:	
Face-to-face learning	36
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/F2147E41-B9FC-2292-0A13-9C8BFD8DF248.html?lang=en-US&login=1

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Aerospace Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2020-21

Aerospace Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2020-21

Aerospace Engineering [Sep][FT][Frenchay][4yrs] MEng 2020-21

Aerospace Engineering [Sep][SW][Frenchay][5yrs] MEng 2020-21

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][3yrs] BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][4yrs] BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][4yrs] MEng 2020-21

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][4yrs] MEng 2020-21

Aerospace Engineering {Apprenticeship} [Sep][FT][UCW][3yrs] BEng (Hons) 2020-21