Module Specification

Aerospace Group Design Project

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Contents

Part 1: Information

Module title: Aerospace Group Design Project

Module code: UFMFUU-15-3

Level: Level 6

For implementation from: 2024-25

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:

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: The ability to work in multidisciplinary teams is a key attribute and requirement of a professional aerospace engineer. Each team will work on developing innovative solutions to a real aerospace engineering challenge from industry or research.

The delivery of the module through seminars and workshops will allow students to follow the development and design cycle of an aerospace engineering project. This

is a problem based learning module and students will apply the project management skills covered in Engineering Practice 1 and Engineering Practice 2 in the management of the team and the successful development of an engineering solution to the challenge.

This module also provides an opportunity for students to demonstrate an entrepreneurial mind set with students expected to research the business context and opportunities to commercialise their engineering solution.

Although there are no pre-requisites for this module, students are expected to have passed key modules in year 2 such as Fundamental Aerodynamics, Propulsion, Flight, Structures and Aerospace Systems Design.

Features: Not applicable

Educational aims: The aim of this module is to ensure that students demonstrate the ability to work in teams on real aerospace engineering problems that integrate knowledge and skills from a range of aerospace disciplines.

Outline syllabus: Task Specifications and Requirements
Design processes and decisions
Concept selection and Economics
Geometrical aspects
Design regulations
Initial and Refined sizing
Aerodynamic and structural design
Power plant design
Performance
Systems and systems integration
Design iterations, validation and verification
Sustainability aspects

Part 3: Teaching and learning methods

Teaching and learning methods: This module integrates many facets of the students learning in a multi-disciplinary design and development project.

A combination of lectures, seminars and case studies are used to present core topics from the syllabus. Laboratory sessions are used for team meetings, development work and familiarisation with specialist software and test equipment.

Independent learning includes hours engaged with essential reading, further team meetings and laboratory based development work undertaken outside the scheduled classes. Students will be expected to maintain the management tools used as part of the group coursework.

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

MO1 Select appropriate project management techniques and maintain relevant documentation to support a design and development project. (P11m, G2, G3)

MO2 Integrate knowledge from aerospace engineering disciplines to facilitate multidisciplinary project work. (P4, EL4, D2, D3b, G4)

MO3 Design and justify engineering solutions to an open-ended technical problem using a systems approach. (SM3b, EA2, EA4b, D2, D4, P8)

MO4 Appraise the commercial opportunities of an engineering solution with reference to intellectual property legislation and relevant industrial standards. (P1, P5)

MO5 Implement an appropriate verification and validation strategy to ensure project requirements are met and risks are reduced. (D2, EL6)

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 8 hours

Total = 0

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/ufmfuu-15-3.html

Part 4: Assessment

Assessment strategy: The assessments follow the development and design cycle with formative assessments used to provide feed forward opportunities and summative assessment used to evaluate achievement and depth of understanding.

The assessment for this module is over two group presentations as follows:

1) Preliminary Design Review (PDR) presentation (30%): Here, the group reports on their selection of the initial design concept and its initial sizing. The mark is a group mark.

2) Final Design Review (FDR) presentation (70%). In this part, groups will present detailed working of their design concept by looking at the breadth of Technical Roles (aerodynamics, structures, powerplant, economics, etc). There will be a group mark (50% of FDR) and an individual mark (50% of FDR).

Peer Assessment will be used to adjust the final mark from PDR and FDR.

Throughout the PDR and FDR assessments, students will demonstrate their individual and collective understanding of project management, the design process and approach, and validation aspects of the group design project.

Resit will consider a design task suitable for an Individual assessment to produce an initial aircraft design with calculations, estimates and design drawings.

Resit: Student will need to submit a PPT type presentation slides (50%), then attend

a presentation/Viva with Q and A (50%).

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

Assessment tasks:

Presentation (First Sit)
Description: Group presentations (30 minutes)
Weighting: 30 %
Final assessment: No
Group work: Yes
Learning outcomes tested: MO1, MO3, MO5

Presentation (First Sit)
Description: Group Presentation
Weighting: 70 %
Final assessment: Yes
Group work: Yes
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Presentation (Resit)
Description: Two Group presentations (30 minutes)

Resit deliverable(s) will be scaled appropriately to group size and task complexity
Weighting: 50 %
Final assessment: No
Group work: Yes
Learning outcomes tested: MO1, MO3, MO5

Presentation (Resit)
Description: Group technical report (max 7500 words)

Resit deliverable(s) will be scaled appropriately to group size and task complexity
Weighting: 50 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Aerospace Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2021-22

Aerospace Engineering [Sep][SW][Frenchay][5yrs] MEng 2021-22

Aerospace Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2020-21

Aerospace Engineering {Apprenticeship-UCW} [Sep][FT][UCW][5yrs] BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][5yrs] MEng 2021-22

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][4yrs] BEng (Hons) 2021-22

Aerospace Engineering with Pilot Studies {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Aerospace Engineering {Apprenticeship-UCW} [Sep][FT][UCW][4yrs] BEng (Hons) 2021-22

Aerospace Engineering {Apprenticeship-UCW} [Sep][FT][UCW][4yrs] BEng (Hons) 2021-22

Aerospace Engineering {Apprenticeship-UWE} [Sep][FT][UCW][4yrs] BEng (Hons) 2021-22

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

Aerospace Engineering [Frenchay] MEng 2022-23

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2022-23

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