



Module Specification

Flight

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Part 1: Information

Module title: Flight

Module code: UFMFFK-15-2

Level: Level 5

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: University Centre Weston

Field: Engineering, Design and Mathematics

Module type: Module

Pre-requisites: Dynamics Modelling and Simulation 2023-24

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module provides a detailed overview of flight mechanics and dynamics concepts using illustrated practical examples and computational exercises to help reinforce concepts of aircraft performance and stability. Students will also have the opportunity to undertake a flight test course in a real aircraft as well as use flight test data to model aircraft dynamic motion.

Features: Not applicable

Educational aims: Introduce students to the fundamentals of flight performance and stability

Outline syllabus: The module aims to introduce students to the mechanics and stability of flight. The student will be exposed to a number of aspects.

Elements of aircraft performance will be covered including trim, take-off and landing, climb, descent, and level flight.

Principles of aircraft longitudinal and lateral static stability will be covered including weight and balance, neutral point, static margin, effect of elevators including elevator angle to trim and stick force gradients, and stick-fixed versus stick-free static stability.

Principles of aircraft longitudinal and lateral dynamic stability covered including mathematical description, analytical solutions to, and numerical simulations of the primary dynamic modes of an aircraft.

Principles of flight test will be covered including in-flight measurements; post-flight calculations; comparison with theory and flight test.

Part 3: Teaching and learning methods

Teaching and learning methods: The skills acquired by the student are demonstrated within a project based framework. A typical project may for instance be the conceptual design of an aircraft. The students are led through the conceptual design by the teaching team upon which the students can then apply the concepts and taught materials. They will then demonstrate their conformance to the learning outcomes in a portfolio of assessments.

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

MO1 Apply concepts and principles in flight theory to model performance, and to static and dynamic stability of aircraft(SM1b, EA1b, EA2)

MO2 Recognise flight test data collection methods (P8)

MO3 Apply fundamental flight test data processing principles to an aircraft (SM1b, SM2b, P8)

MO4 Use analytical and numerical models to assess the aircraft dynamic flight modes (SM1b, EA1b, EA2, P8)

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 113 hours

Face-to-face learning = 13 hours

Total = 0

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link <https://rl.talis.com/3/uwe/lists/0EF1C44C-BBCD-7D1A-66EA-79D8EE2E3487.html?draft=1&lang=en-GB&login=1>

Part 4: Assessment

Assessment strategy: The assessment for this module is as follows:

Group oral examination (up to 30 min) designed to encourage timely engagement with the material and consolidate understanding of theoretical principles. Using aircraft as case studies, the examination is based on a group presentation (40%).

In-person individual exam, designed to engage students in the understanding of the fundamentals of Flight and the impact of design parameters on aircraft performance. Professional body requirements about flight test measurement methods are assessed through the individual examination (60%).

Resit Assessments

The resit assessment will be the same as the first sit but individually. Any new data

will be provided so that the students can do the work without access to specialist software or equipment.

The presentation will be based on a similar aircraft case study but with scaled deliverables. Submission will be through a self-recorded presentation and with set questions that are released on the day that the students are to submit the recording (40%).

In-person individual exam (60%).

Assessment tasks:

Presentation (First Sit)

Description: Oral examination (30 minutes per student)

Weighting: 40 %

Final assessment: No

Group work: Yes

Learning outcomes tested: MO1, MO4

In-class test (First Sit)

Description: Individual exam on fundamentals of Flight and flight test measurement methods

Weighting: 60 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

Presentation (Resit)

Description: Oral examination (30 minutes per student)

Weighting: 40 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO4

In-class test (Resit)

Description: Individual exam on fundamentals of Flight and flight test measurement methods

Weighting: 60 %

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-UWE} [UCW] 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 {Apprenticeship-UCW} [UCW] BEng (Hons) 2023-24

Aerospace Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2023-24

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

Aerospace Engineering [Frenchay] MEng 2023-24

Aerospace Engineering [Frenchay] MEng 2023-24

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

Aerospace Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2023-24

Aerospace Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2023-24

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

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

2022-23