# Module Specification

## Introduction to Aeronautics

Version: 2023-24, v2.0, 18 May 2023

**Contents**

## Part 1: Information

**Module title:** Introduction to Aeronautics

**Module code:** UFMFDH-15-1

**Level:** Level 4

**For implementation from:** 2023-24

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**Faculty:** Faculty of Environment & Technology

**Department:** FET Dept of Engineering Design & Mathematics

**Partner institutions:** None

**Field:** Engineering, Design and Mathematics

**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:** This module aims to provide an introduction to the degree topic. Other level 1 modules provide a more general set of fundamental engineering modules which are vital to a student attaining a firm basis in the discipline.

This module is designed to provide a solid foundation of knowledge, with practical exercises to reinforce which will be used to extend specialist knowledge in future years.

**Features:** Not applicable

**Educational aims:** See Learning Outcomes.

**Outline syllabus:** Introduction to fluid dynamics, pressure, density, hydrostatic pressure

Volumetric and mass flow rates, continuity and Bernoulli's equation

Flow measurement devices and calculations

Dimensional analysis for engineering problems

Flow types: laminar and turbulent flow, characteristics including solving basic problems

Introduction to aircraft familiarisation

Introduction to basic aerodynamics.

Use of the university subsonic windtunnel and the flight simulator

Wing design for a model aircraft and basic performance and balance calculations

## Part 3: Teaching and learning methods

**Teaching and learning methods:** Large group lecture supported by small group tutorial sessions. Study time outside of contact hours will be spent on going through example problems and designing/testing and manufacturing the model aircraft.

Lab sessions (small groups) will provide experience of the use of the flight simulator and the windtunnel.

Scheduled learning includes lectures, tutorials and laboratory session

Independent learning includes hours engaged with essential reading, assignment preparation and completion etc

Approximate contact hours:
Lecture 24
Tutorial 12
Laboratory 4

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

**MO1** Show a detailed knowledge and understanding of key principles in fluid dynamics and aerodynamics analysis

**MO2** Demonstrate a basic understanding and knowledge of modelling and solving numerical problems in fluid dynamics, based on knowledge of the relevant engineering principles

**MO3** Demonstrate the ability to use specific aerospace equipment such as the subsonic windtunnel and the flight simulator

**MO4** Understand the basics of aircraft composition

**MO5** Show an understanding of basic model aircraft flying requirements, specifically the basics of wing design, and the balance of the model aircraft in flight

**MO6** Show cognitive skills with respect to modelling and simplifying real problems, and applying mathematical methods of analysis

**MO7** Demonstrate key transferable skills in problem formulation and decision making, interpreting experimental results

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 110 hours

Face-to-face learning = 40 hours

Total = 150

**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/ufmfdh-15-1.html

## Part 4: Assessment

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

EXAM:
An end of semester Exam of 2 hours in which learning outcomes are assessed through the specific exam questions.

Formative assessments (not contributing to module mark) is provided via support in tutorial sessions.

REPORT:
Report on the model aircraft assignment in the form of a group presentation of 30 mins held during term time. In this assignment it is required that use of the subsonic windtunnel is made by the student group. The presentation will cover aspects of wing design, aerodynamic modelling and aeroplane balance.

Formative assessments provided via support in tutorial sessions.

Resit is the same as the first sit

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

**Assessment tasks:**

**Examination** (First Sit)
Description: End of semester exam (2 hours)
Weighting: 50 %

Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO4, MO6

**Presentation** (First Sit)
Description: Model aircraft design and build project (presentation 30 mins.)
Weighting: 50 %
Final assessment: No
Group work: Yes
Learning outcomes tested: MO3, MO5, MO6, MO7

**Examination** (Resit)
Description: Exam (2 hours)
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested:

**Presentation** (Resit)
Description: Model aircraft design and build project (presentation 30 mins.)

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

## Part 5: Contributes towards

This module contributes towards the following programmes of study: