



## **Module Specification**

### **Avionics**

Version: 2023-24, v2.0, 27 Mar 2023

#### **Contents**

<b>Module Specification .....</b>	<b>1</b>
<b>Part 1: Information .....</b>	<b>2</b>
<b>Part 2: Description .....</b>	<b>2</b>
<b>Part 3: Teaching and learning methods .....</b>	<b>3</b>
<b>Part 4: Assessment.....</b>	<b>4</b>
<b>Part 5: Contributes towards .....</b>	<b>6</b>

## Part 1: Information

**Module title:** Avionics

**Module code:** UFMFWU-15-3

**Level:** Level 6

**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:**

**Module type:** Module

**Pre-requisites:** Aerospace Systems Design 2022-23

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** This module explores modern avionics and associated standards present within the aerospace industry. This will include avionics architectures, electrical and electronic systems, actuation, guidance, navigation and autonomy, flight deck, and avionics standards and certification.

Students also undertake an avionics design and prototype project where they apply relevant avionics concepts and the aerospace systems design principles delivered

prior to an avionics design and integration project using commercial-off-the-shelf hardware.

**Features:** Not applicable

**Educational aims:** The aim of this module to provide a broad study of modern avionics with illustrated and practical examples, computational exercises and group project work so that students can experience how complex avionics are designed, developed and certified.

**Outline syllabus:** Introduction and evolution of avionics in aerospace

Electrical systems (power, electrical machines and drives, AC/DC)

Electronic systems (information transmission)

Actuators

Architectures, buses, interfaces

Sensing, Guidance, Navigation and Autonomy

Software applications, operating systems, embedded hardware

Avionics standards and certification (hardware and software)

Flight Decks

Flight simulation (hardware in the loop, software in the loop)

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** Avionics systems and related concepts are introduced to students in lectures so that they understand the scope of each topic area. Small group discussions and case studies form the activity that takes place in

tutorial sessions allowing students to learn collaboratively and consolidate their understanding of the material.

Students will have the opportunity to further consolidate their learning through the avionics design and prototype activity.

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

**MO1** Explain in detail the fundamental operation and underlying technology behind modern avionic systems in civil and military aircraft. (SM1b, SM4m, P9m, P10m)

**MO2** Interpret interactions between complex analogue and digital systems on aircraft. (SM1b, SM2b)

**MO3** Implement and evaluate avionic systems in simulation and using commercial-off-the-shelf hardware. (SM5m, P8, G1)

**MO4** Design avionics to achieve performance, operational, logistic requirements and industry safety and certification standards. (EA2, EA4m, D2, EL5m, P4m, P6, G4)

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 114 hours

Case study(ies) = 12 hours

Total = 150

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://rl.talis.com/3/uwe/lists/9F41E396-748C-3470-31B8-DF6D364474E6.html?lang=en-US&login=1) via the following link <https://rl.talis.com/3/uwe/lists/9F41E396-748C-3470-31B8-DF6D364474E6.html?lang=en-US&login=1>

## Part 4: Assessment

**Assessment strategy:** The assessment strategy is designed to ensure that students demonstrate the ability to apply systems thinking and design concepts to the design, analysis and evaluation of an avionics system.

The assessment for this module is as follows:

A scenario based exam using questions that combine theory, analysis and application.

A project/case study which provides students with an opportunity to develop, implement and evaluate avionics systems in simulation and using commercial-off-the-shelf hardware. The expected output is a group report, with individual reflection and accompanying project simulation files.

The group report mark will be moderated using a peer review process in accordance with the Department Group Work Policy.

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: Scenario based exam (2 hours)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO4

**Report (First Sit)**

Description: Group report and accompanying project simulation files and individual reflection (max 2500 words).

Weighting: 50 %

Final assessment: No

Group work: Yes

Learning outcomes tested: MO2, MO3, MO4

**Examination (Resit)**

Description: Scenario based exam (2 hours)

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO4

**Report (Resit)**

Description: Group report and accompanying project simulation files and individual reflection (max 2500 words).

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

Weighting: 50 %

Final assessment: No

Group work: Yes

Learning outcomes tested: MO2, MO3, MO4

**Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Aerospace Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2021-22

Aerospace Engineering [Sep][FT][Frenchay][4yrs] MEng 2021-22

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][4yrs] MEng 2021-22

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][3yrs] BEng (Hons)  
2021-22

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

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

Aerospace Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2020-21

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

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

Aerospace Engineering with Pilot Studies {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2020-21