MODULE SPECIFICATION

Part 1: Information			
Module Title	Avionics		
Module Code	UFMFWU-15-3	Level	Level 6
For implementation from	2022-23		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	
Department	FET Dept of Engineering Design & Mathematics		
Module Type:	Standard		

Pre-requisites	Aerospace Systems Design 2021-22
Excluded Combinations	None
Co-requisites	None
Module Entry Requirements	None
PSRB 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.

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)

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.

Part 3: Assessment

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.

Component A consists of a two hour scenario based exam using questions that combine theory, analysis and application.

Component B consists of 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 5000 word group report, a 1000 word individual reflective report 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.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	50 %	Scenario based exam (2 hours)
Report - Component B		40 %	5000 word group report and accompanying project simulation files.
Report - Component B		10 %	1000 word individual reflective report.
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A		50 %	Scenario based exam (2 hours)
Report - Component B		50 %	2000 word individual report and accompanying project simulation files.

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** Explain in detail the fundamental operation and underlying technology behind modern avionic systems in civil and military aircraft. (SM1b, SM4m, P9m, P10m) — MO1 Interpret interactions between complex analogue and digital systems on aircraft. (SM1b, SM2b) — MO2 Implement and evaluate avionic systems in simulation and using commercial-off-the-shelf hardware. (SM5m, P8, G1) — MO3 Design avionics to achieve performance, operational, logistic requirements and industry safety and certification standards. (EA2, EA4m, D2, EL5m, P4m, P6, G4) — MO4
Contact Hours	**Independent Study Hours:** Independent study/self-guided study: 114 **Total Independent Study Hours:** 114 **Scheduled Learning and Teaching Hours:** Case study(ies): 12 Computer-based activities: 12 Lectures: 12 **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/9F41E396-748C-3470-31B8-DF6D364474E6.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][FT][Frenchay][4yrs] MEng 2020-21

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

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