MODULE SPECIFICATION

Part 1: Information			
Module Title	Applied Aerodynamics		
Module Code	UFMFH7-15-3	Level	Level 6
For implementation from	2020-21		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Module Type:	Standard		
Pre-requisites	Flight 2019-20, Fundamental Aerodynamics 2019-20		
Excluded Combinations	None		
Co-requisites	None		
Module Entry Requirements	None		
PSRB Requirements	None		

Part 2: Description

Overview: The module covers intermediate theoretical and practical aspects of aerodynamics

Educational Aims: See Learning Outcomes.

Outline Syllabus: This module builds on the fundamentals of fluid dynamics at lower levels with the following concepts:-

- Revision of fundamentals of viscous flows: conservation laws, laminar boundary layer and turbulent boundary layer
- Momentum methods
- Pressure gradient and boundary layer separation.
- Flow transition: boundary layer transition process, prediction of the onset of transition.
- Compressible flow: governing equations for normal and oblique shock waves, expansion waves, shock interactions, and application to lifting surfaces, diffusers, nozzles and engine intakes.
- Low order numerical methods
- Use of the wind tunnel for internal and external aerodynamics

Teaching and Learning Methods: Lectures/lectorials to convey concepts and principles
Tutorials and self-paced sessions to reinforce concepts and principles
Laboratory experiments and practical tasks designed to assimilate concepts and principles in a kinesthetic way and promote self-learning

Part 3: Assessment

Component A is a two hour examination that will assess acquisition of skills, knowledge, concepts and principles in lectures, tutorials and experiments under controlled conditions

Component B ensures that students are able to demonstrate their understanding of underpinning principles within a practical or simulated practical environment where a portfolio of practical skills are assessed for example wind tunnel tests or coding of flow field prediction methods. The practical environment is intended to help assimilate principles and concepts in a kinesthetic manner and provide an opportunity for reflection of practice and theory

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	50 %	Examination on Aerodynamics (2 hrs)
Practical Skills Assessment - Component B		50 %	Assignment in aerodynamics
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	50 %	Examination on aerodynamics (2 hrs)
Practical Skills Assessment - Component B		50 %	Assignment in aerodynamics

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**
Use relevant theory to predict boundary layer development, flow separation, transition and supersonic flow properties.	MO1
Apply momentum methods to predict aerodynamic loads.	MO2
Demonstrate appropriate expertise in the use of ground based experimental facilities to acquire and process suitable data, and analyse flow simulations	MO3
Demonstrate key transferable skills in problem formulation in aerodynamics applications, decision making, self-management and communication	MO4

Contact Hours

Independent Study Hours:

Independent study/self-guided study	114
Total Independent Study Hours:	114

	Scheduled Learning and Teaching Hours:	
	Face-to-face learning	36
	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://uwe.rl.talis.com/modules/ufmfh7-15-3.html	

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Aerospace Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering (Systems) [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies (Design) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies (Systems) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies (Design) [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies (Systems) [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering (Design) [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering (Design) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering (Systems) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19