



MODULE SPECIFICATION

Part 1: Information			
Module Title	Fundamental Aerodynamics		
Module Code	UFMFRK-15-2	Level	Level 5
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	Engineering Mathematics 2019-20, Introduction to Aeronautics 2019-20, Pilot Studies and Aeronautics 2019-20		
Excluded Combinations	None		
Co-requisites	None		
Module Entry Requirements	None		
PSRB Requirements	None		

Part 2: Description
<p>Overview: Pre-requisites: Student must take UFMFJ9-30-1 Engineering Mathematics AND either UFMFDH-15-1 Introduction to Aeronautics OR UFMFDK-15-1 Pilot Studies and Aeronautics.</p> <p>Educational Aims: This module provides a detailed overview of fundamental aerodynamics using illustrated practical examples and computational exercises to help students gain a true feel for aerodynamic flow.</p> <p>Outline Syllabus: In this module you will cover:</p> <p>Subsonic flow over aerofoils and wings: flow field characteristics; influential flow field and shape parameters; stall and separation; boundary layer flows</p> <p>Potential theory; 2D aerofoils and 3D wing theory including vortex systems</p> <p>Transonic and supersonic flows over aerofoils; compressible flows; shock waves</p> <p>High lift profiles and devices and effects of leading and trailing edge wings</p>

STUDENT AND ACADEMIC SERVICES

Introduction to Computational Fluid Dynamics (CFD): relevant equations; principles of discretisation; turbulence models; mesh generation; boundary conditions; accuracy and convergence; post-processing; validation and assessment of results.

Teaching and Learning Methods: See assessment strategy.

Part 3: Assessment

Component A:

Assessed in controlled conditions via end of semester Exam of 2 hours (50%) in which MO1 is covered through the specific exam questions. Formative assessments (not contributing to module mark) are provided via support in tutorial sessions.

Component B:

Assignment on aerodynamics using numerical simulation software (MO2) assessed through a presentation. Students will be expected to demonstrate awareness of professional literature on aerodynamics theory (MO3) as well as demonstrating decision making and communication skills as a group (MO4). Formative assessment and coursework support will be provided in the tutorial and coursework support sessions.

In the referred assessment component B will be assessed via an individual report and individual presentation.

First Sit Components	Final Assessment	Element weighting	Description
Examination (Online) - Component A	✓	50 %	Online Examination
Presentation - Component B		25 %	Assignment in aerodynamics (30 min group presentation)
Report - Component B		25 %	Group report
Resit Components	Final Assessment	Element weighting	Description
Examination (Online) - Component A	✓	50 %	Online Examination
Presentation - Component B		25 %	Assignment in aerodynamics (15 mins individual presentation)
Report - Component B		25 %	Individual report (2000 words)

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 aerodynamic theory for describing subsonic, transonic and supersonic flows	MO1
	Use of numerical models to produce simulations of aerodynamic flows for basic geometries in difference flow regimes	MO2
	Demonstrate key transferable skills in problem formulation and decision making, self-management and communication	MO3
	Interpret and utilise professional literature in their work.	MO4
Contact Hours	Independent Study Hours:	

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	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	<p>The reading list for this module can be accessed via the following link:</p> <p>https://uwe.rl.talis.com/index.html</p>	

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Aerospace Engineering [Sep][SW][Frenchay][5yrs] MEng 2019-20
 Aerospace Engineering (Design) {Apprenticeship} [Sep][PT][UCW][4yrs] BEng (Hons) 2019-20
 Aerospace Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20
 Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][5yrs] MEng 2019-20
 Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][4yrs] BEng (Hons) 2019-20
 Aerospace Engineering (Design) [Sep][SW][Frenchay][5yrs] MEng 2019-20
 Aerospace Engineering (Systems) [Sep][FT][Frenchay][4yrs] MEng 2019-20
 Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20
 Aerospace Engineering with Pilot Studies (Design) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20
 Aerospace Engineering with Pilot Studies (Design) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2019-20
 Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][4yrs] MEng 2019-20
 Aerospace Engineering (Design) [Sep][FT][Frenchay][4yrs] MEng 2019-20
 Aerospace Engineering (Manufacturing) [Sep][SW][Frenchay][5yrs] MEng 2019-20
 Aerospace Engineering with Pilot Studies (Design) [Sep][SW][Frenchay][5yrs] MEng 2019-20
 Aerospace Engineering with Pilot Studies (Manufacturing) [Sep][SW][Frenchay][5yrs] MEng 2019-20
 Aerospace Engineering with Pilot Studies (Systems) [Sep][SW][Frenchay][5yrs] MEng 2019-20
 Aerospace Engineering with Pilot Studies (Systems) [Sep][FT][Frenchay][4yrs] MEng 2019-20
 Aerospace Engineering with Pilot Studies (Manufacturing) [Sep][FT][Frenchay][4yrs] MEng 2019-20
 Aerospace Engineering with Pilot Studies (Design) [Sep][FT][Frenchay][4yrs] MEng 2019-20
 Aerospace Engineering with Pilot Studies (Manufacturing) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20

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Aerospace Engineering with Pilot Studies (Systems) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20
Aerospace Engineering with Pilot Studies (Systems) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2019-20
Aerospace Engineering (Manufacturing) [Sep][FT][Frenchay][4yrs] MEng 2019-20
Aerospace Engineering [Sep][FT][Frenchay][4yrs] MEng 2019-20
Aerospace Engineering (Systems) [Sep][SW][Frenchay][5yrs] MEng 2019-20
Aerospace Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2019-20
Aerospace Engineering (Design) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20
Aerospace Engineering (Design) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2019-20
Aerospace Engineering (Manufacturing) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20
Aerospace Engineering (Manufacturing) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2019-20
Aerospace Engineering (Systems) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20
Aerospace Engineering (Systems) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2019-20
Aerospace Engineering (Manufacturing) {Apprenticeship} [Sep][PT][UCW][4yrs] BEng (Hons) 2019-20
Aerospace Engineering (Design) {Apprenticeship} [Sep][PT][COBC][4yrs] BEng (Hons) 2019-20
Aerospace Engineering with Pilot Studies (Systems) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19
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Aerospace Engineering (Manufacturing) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19
Aerospace Engineering (Systems) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19
Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19
Aerospace Engineering Manufacturing [Sep][PT][UCW][4yrs] FdSc 2018-19
Aerospace Engineering (Design) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19
Aerospace Engineering (Design) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19
Aerospace Engineering with Pilot Studies (Design) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19
Aerospace Engineering (Systems) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19