MODULE SPECIFICATION

Part 1: Information			
Module Title	Fundamental Aerodynamics		
Module Code	UFMFRK-15-2	Level	Level 5
For implementation from	2018-19		
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		
Contributes towards			
Module type:	Standard		
Pre-requisites	Engineering Mathematics 2018-19, Introduction to Aeronautics 2018-19		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Educational Aims: See Learning Outcomes.

Outline Syllabus: In this module you will cover:

Subsonic flow over aerofoils and wings: flow field characteristics; influential flow field and shape parameters; stall and separation; boundary layer flows

Potential theory; 2D aerofoils and 3D wing theory including vortex systems

Transonic and supersonic flows over aerofoils; compressible flows; shock waves

High lift profiles and devices and effects of leading and trailing edge wings

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: 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.

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 in the form of a 30 minute group presentation. In this assignment it is required that use of numerical simulation software (MO2) is made by the group. Students may also use the wind tunnel as a method for validation (MO3). Students will be expected to demonstrate awareness of professional literature on aerodynamics theory (MO4) as well as demonstrating decision making and communication skills as a group (MO5). Group work procedures (e.g. group member responsibilities and mediation process) will be outlined in the module handbook and peer review is incorporated within the assessment process to ensure that the group work aspect is a positive experience for students and staff. Formative assessment and coursework support will be provided in the tutorial and coursework support sessions.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Presentation - Component B		50 %	Assignment in aerodynamics (30 min group presentation)
Examination - Component A	✓	50 %	Examination (2 hours)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Presentation - Component B		50 %	Assignment in aerodynamics (30 mins individual presentation)
Examination - Component A	✓	50 %	Examination (2 hrs)

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will be able to:

	Module Learning Outcomes
MO1	Use aerodynamic theory for describing subsonic, transonic and supersonic flows
MO2	Use of numerical models to produce simulations of aerodynamic flows for basic geometries in difference flow regimes
MO3	Operate a wind-tunnel
MO4	Demonstrate key transferable skills in problem formulation and decision making, selfmanagement and communication
MO5	Demonstrate awareness of, and access to professional literature

Contact Hours

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/index.html