



## MODULE SPECIFICATION


Part 1: Information			
Module Title	Fundamental Aerodynamics		
Module Code	UFMFRK-15-2	Level	2
For implementation from	September 2019		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment and Technology	Field	Engineering, Design and Mathematics
Department	Engineering, Design and Mathematics		
Contributes towards	BEng (Hons) Aerospace Engineering (compulsory), MEng Aerospace Engineering (compulsory), BEng (Hons) Aerospace Engineering with Pilot Studies (compulsory), MEng Aerospace Engineering with Pilot Studies (compulsory),		
Module type:	Standard		
Pre-requisites	UFMFJ9-30-1 Engineering Mathematics AND EITHER UFMFDH-15-1 Introduction to Aeronautics OR UFMFDK-15-1 Pilot Studies and Aeronautics.		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p>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>In this module you will cover:</p> <ol style="list-style-type: none"> <li>1. Subsonic flow over aerofoils and wings: flow field characteristics; influential flow field and shape parameters; stall and separation; boundary layer flows</li> <li>2. Potential theory; 2D aerofoils and 3D wing theory including vortex systems</li> <li>3. Transonic and supersonic flows over aerofoils; compressible flows; shock waves</li> <li>4. High lift profiles and devices and effects of leading and trailing edge wings</li> <li>5. 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.</li> </ol>

## STUDENT AND ACADEMIC SERVICES

<b>Part 3: Assessment</b>		
<p><b>Component A:</b> Assessed in controlled conditions via end of semester Exam of 2 hours (50%) in which LO1 is covered through the specific exam questions. Formative assessments (not contributing to module mark) are provided via support in tutorial sessions.</p> <p><b>Component B:</b> Assignment on aerodynamics using numerical simulation software (LO2) assessed through a presentation. Students will be expected to demonstrate awareness of professional literature on aerodynamics theory (LO4) as well as demonstrating decision making and communication skills as a group (LO5). Formative assessment and coursework support will be provided in the tutorial and coursework support sessions.</p>		
Identify final timetabled piece of assessment (component and element)	Component A1	
<b>% weighting between components A and B (Standard modules only)</b>	<b>A: 50</b>	<b>B: 50</b>
<b>First Sit</b>		
<b>Component A (controlled conditions) Description of each element</b>	<b>Element weighting</b>	
1. Examination (2 hours)	100	
<b>Component B Description of each element</b>	<b>Element weighting</b>	
1. Assignment in aerodynamics (30 minute group presentation)	100	
<b>Resit (further attendance at taught classes is not required)</b>		
<b>Component A (controlled conditions) Description of each element</b>	<b>Element weighting</b>	
1. Examination (2 hours)	100	
<b>Component B Description of each element</b>	<b>Element weighting</b>	
1. Assignment in aerodynamics (15 minute individual presentation)	100	
<b>Part 4: Teaching and Learning Methods</b>		
<b>Learning Outcomes</b>	<p>On successful completion of this module students will be able to:</p> <ol style="list-style-type: none"> <li>1) Use aerodynamic theory for describing subsonic, transonic and supersonic flows</li> <li>2) Use of numerical models to produce simulations of aerodynamic flows for basic geometries in difference flow regimes</li> <li>3) Demonstrate key transferable skills in problem formulation and decision making, self-management and communication</li> <li>4) Interpret and utilise professional literature in their work.</li> </ol>	

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Key Information Sets Information (KIS)	<b>Key Information Set - Module data</b>																							
	<i>Number of credits for this module</i>				15																			
Contact Hours	Hours to be allocated	Scheduled learning and teaching study hours	Independent study hours	Placement study hours	Allocated Hours																			
	150	36	114	0	150																			
Total Assessment																								
Reading List	The table below indicates as a percentage the total assessment of the module which constitutes a;																							
	<p><b>Written Exam:</b> Unseen written exam  <b>Coursework:</b> Written assignment, report and/or presentation</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2">Total assessment of the module:</td> <td></td> <td></td> </tr> <tr> <td>Written exam assessment percentage</td> <td></td> <td style="text-align: center;">50%</td> <td></td> </tr> <tr> <td>Coursework assessment percentage</td> <td></td> <td style="text-align: center;">50%</td> <td></td> </tr> <tr> <td>Practical exam assessment percentage</td> <td></td> <td style="text-align: center;">0%</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td style="text-align: center;">100%</td> </tr> </table>					Total assessment of the module:				Written exam assessment percentage		50%		Coursework assessment percentage		50%		Practical exam assessment percentage		0%				
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Written exam assessment percentage		50%																						
Coursework assessment percentage		50%																						
Practical exam assessment percentage		0%																						
			100%																					
	Essential reading material is provided as study notes on Blackboard. Additional external reading resources are listed on the following reading list link  <a href="https://rl.talis.com/3/uwe/lists/953C3CC7-B0BC-AA92-B1C7-4FDEC4ADAADA.html">https://rl.talis.com/3/uwe/lists/953C3CC7-B0BC-AA92-B1C7-4FDEC4ADAADA.html</a>																							

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First Approval Date	11 November 2016			
Revision Approval Date		Version	1	Link to <a href="#">RIA</a> (ID 3982)
	29 May 2019		2	Link to <a href="#">RIA</a> (ID 5149)