MODULE SPECIFICATION

Part 1: Information			
Module Title	Aerodynamics C		
Module Code	UFMEWA-15-M	Level	Level 7
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	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
Overview: Module Entry requirements, the module is intended for science and engineering graduates, or equivalent, with strong mathematical skills. **Educational Aims:** See learning outcomes. **Outline Syllabus:** Unsteady Aerodynamics: Review of the basic laws, Theodorsen equation, panel methods Oscillating airfoils in incompressible, subsonic, and supersonic flows Arbitrary airfoil motion, oscillating finite wings Unsteady motion of finite wings

Unsteady motion of non-lifting bodies

Unsteady boundary layer flow in two-dimensional and asymmetric flows

Periodic boundary layer flows

Unsteady separation

Oscillating flow in a pipe

Unsteady compressible boundary layers

Aero-elastic buffet

Stall flutter

Teaching and Learning Methods: Students will learn through a combination of formal lectures and tutorial sessions.

Part 3: Assessment			
The module is examined via an open book exam.			
First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	100 %	Open book exam (180 minutes)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	100 %	Open book exam (180 minutes)

Part 4: Teaching and Learning Methods

Learning Outcomes

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

	Module Learning Outcomes
MO1	The key principles of unsteady aerodynamics
MO2	The differences between buffet and stall flutter
MO3	The numerical methods used for unsteady aerodynamics
MO4	Unsteady motion on wings and no-lifting bodies
MO5	The physics of unsteady aerodynamics (subsonic/transonic and supersonic flows) and numerical methods, such as panel methods and Theodorsen equation
MO6	Applications of theoretical predictions to wings
MO7	The numerical/experimental data from a wing
MO8	The unsteady phenomena caused by the interaction between the shock on the upper surface and the separation characterized by a main frequency corresponding to the shock movement and the pulsation of the separation
MO9	Panel methods for analysis of lift generation and oscillating airfoils
MO10	The boundary-layer viscous – inviscid interaction
MO11	The Theordorsen function, which is essentially a Fourier Transform of the Wagner Function, and understand its limitations
MO12	Relevant professional literature
MO13	Problem formulation and decision making

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/modules/ufmewa-15-m.html