

## MODULE DESCRIPTION FORM

### DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

## ME201 AERO-DESIGN AND FLIGHT TEST

<b>Module Registrar:</b> Dr M Afsar <a href="mailto:mohammed.afsar@strath.ac.uk">mohammed.afsar@strath.ac.uk</a>	<b>Taught To (Course):</b> Cohorts for whom class is compulsory		
<b>Other Lecturers Involved:</b> Dr J Yuan; Dr M T Stickland	<b>Credit Weighting:</b> 10 (ECTS 5)	<b>Semester:</b> 2	
<b>Assumed Prerequisites:</b> 16231 Flight and Spaceflight	<b>Compulsory class</b>	<b>Academic Level:</b> 2	<b>Suitable for Exchange:</b> N

#### Module Format and Delivery (HOURS i.e. 1 credit = 10hrs of study):

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	Total
20				20 (flight test course)			40	20	100

#### Educational Aim

This module builds on the initial work carried out in Flight and Space Flight 1. The taught part of the class is reinforced by experimental investigation, flight experience and flight test. The class is also intended to introduce students to the mathematical modelling tools they will require in the third year aero design class.

Topics covered include:

- Aircraft design.
- Airworthiness and the flight envelope.
- Static, longitudinal stability and control of aircraft is considered.
- The standard atmosphere – variation of temperature, pressure and density with height is explained.

The calculation of the performance of aircraft is studied: Indicated and true airspeed. Steady level flight – minimum drag and minimum power flight speed. Steady glide and climb. Take-off and landing. Steady turning flight. Range and endurance. Flight and gust envelopes.

Students may opt out of the flight training course should they wish, however this is not recommended.

#### Learning Outcomes

On completion of the module the student is expected to be able to:

- LO1 Demonstrate a thorough understanding of high lift devices on wings
- LO2 Demonstrate a thorough understanding of the linkages between aircraft performance and aerodynamic performance
- LO3 Demonstrate a thorough understanding of the relationship between the centre of gravity location and the stability and controllability of conventional aircraft.

#### Syllabus

The module will teach the following:

1. Aircraft design process
2. Airworthiness
3. Longitudinal stability and control
4. Flight performance
5. Flight test course

## Assessment of Learning Outcomes

### Criteria

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:

LO1 & 2 Are assessed by a single coursework.

C1 Understanding of principles demonstrated through calculations and written descriptions.

C2 Through calculations and written descriptions, demonstrate understanding of how overall performance is affected by design selections – e.g. wing sections and wing configuration.

LO3 Is assessed by a second coursework.

C1 Understanding of principles demonstrated through calculations and written descriptions.

C2 Through calculations and written descriptions, demonstrate understanding of how overall stability and control effectiveness is affected by design selections and aircraft configuration.

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

### Principles of Assessment and Feedback

(within Assessment and Feedback Policy at: <https://www.strath.ac.uk/professionalservices/staff/policies/academic/>.)

Assessment is by two courseworks; students should expect to spend a considerable amount of effort completing these courseworks as they form an important learning exercise as well as an assessment unit.

Informal feedback is provided directly within lectures, with self and peer-directed feedback encouraged during the course to the extent that it does not impinge on collaborative working. Written feedback is provided on returned coursework reports.

### Assessment Method(s) Including Percentage Breakdown and Duration of Exams (*individual weightings*)

Examination				Coursework		Practical		Project	
Number	Month(s)	Duration	Weighting	Number	Weighting	Number	Weighting	Number	Weighting
				2	100% (50% each)				
*				* LO1, LO2, LO3		*		*	

\* **L/Os:** Indicate which Learning Outcomes (LO1, LO2, etc) are to be assessed by exam/coursework/practical/project as required.

### Coursework / Submissions deadlines (*academic weeks*):

Late submission will not be accepted; deadlines will be communicated in lectures with at least two-week notice.

### Resit Assessment Procedures:

Submission of alternate <sup>^^</sup>coursework prior to commencement of the August exam diet.

<sup>^^</sup>Students must contact the module Registrar for details as soon as results confirm that a resit is required.

### PLEASE NOTE:

Students must gain a summative mark of 40% to pass the module. Students who fail the module at the first attempt will be re-assessed before the August diet. This re-assessment will consist entirely of coursework. No marks from any previous attempts will be transferred to a new resit attempt.

### Recommended Reading

**\*\*\*Purchase recommended    \*\*Highly recommended reading    \*For reference**

“Introduction to Flight” by Anderson, McGraw Hill, ISBN 0-07-109282-X

### Additional Student Feedback

(Please specify details of when additional feedback will be provided)

Date	Time	Room No
		Check timetable webpages for details

Session: 2021/22

### Approved:

**Course Director Signature:    Dr E Henderson (SG)**

**Date of Last Modifications:    September 3, 2021**

## MODULE TIMETABLE

Module Code:

ME201

Module Title:

Aero-Design and Flight Test

### Brief Description of Assessment:

2 Courseworks during Semester 2, the first of which is issued in four parts immediately after lectures.

### Assessment Timing:-

Indicate on the table below the start/submission dates for each assignment/project and the timing of each exam/assessment using the dropdowns provided. Dropdowns can be left blank. Add extra notes below the dropdowns.

**Please note: Timings can change, this should only be used as a guide.**

Semester One	W&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.

Semester Two	C&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	None	None	Course work Set	Course work Set	Course work Submit Course work Set	Course work Submit Course work Set	Course work Submit	Course work Submit	Course work Submit	Course work Set	None	None	Course work Submit