MODULE DESCRIPTION FORM

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

16259 AERO-DESIGN 1

Module Registrar: Dr E Minisci edmondo.minisci@strath.ac.uk	**Taught To (Course): Cohorts for whom module is optional**		
Other Lecturers Involved:	**Credit Weighting: 10 (ECTS 5)**	**Semester: 2**	
Assumed Prerequisites: 16231 Flight and Spaceflight 1	**Optional module**	**Academic Level: 2**	**Suitable for Exchange: Y**

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

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	**Total**
24							20	56	100

Educational Aim

This module builds on the initial study carried out in Flight and Space Flight 1.

This module aims to provide an introduction to the mechanics of flight of fixed winged aircraft. Using a combination of lectures, practical simulations, and assignments, students will develop a comprehensive understanding of flight mechanics principles and their application to real-world scenarios.

Learning Outcomes

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

LO1 Demonstrate a thorough understanding of the aircraft motion.
LO2 Demonstrate a thorough understanding of the most critical manoeuvres.
LO3 Demonstrate a thorough understanding of the stability of conventional aircraft.

Syllabus

The module will teach the following:

1. The equations of motion in body-axis and wind-axis reference frames.
2. Avionics: flight Instruments
3. Aircraft performance: flight envelope;
4. Performance during glide and climb;
5. Range and endurance.
6. Take-off and landing.
7. Manoeuvring flight.
8. Longitudinal and lateral-directional static stability.
9. Concepts of dynamic stability.

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
C1 Students should be able to understand and describe the equation of motions for a general fixed-wing aircraft.

LO2
C1 Students should be able to understand and describe the most critical manoeuvres.
C2 Students should be able to analyse the most critical manoeuvres.

LO3
C1 Students should be able to understand and explain the main concepts of static and dynamic stability.
C2 Students should be able to analyse the stability of a general aircraft using the appropriate tools.

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 includes two online quizzes; students should expect to spend a considerable amount of effort to prepare for them 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.

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

Examination				**Coursework**		**Practical**	
Number	Month(s)	Duration	***Weighting***	Number	***Weighting***	Number	***Weighting***
1	April/May	1.5h	60%	2 online quizzes/tests	40% (20% each)	1	Pass
* LO1, LO2, LO3				* LO1, LO2, LO3			

* ***L/Os:*** *Indicate which Learning Outcomes (L01, L02, etc) are to be assessed by exam/coursework/practical/project as required.*

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

Resit Assessment Procedures:
1.5hr examination in July/August diet

^^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 prior to the July/August exam 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 Aircraft Flight Mechanics: Performance, Static Stability, Dynamic Stability, and Classical Feedback Control by T.R. Yechout, with S.L. Morris, D.E. Bossert, W.F. Hallgren, AIAA, 2003
- "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: 2025/26

Approved:

Programme Lead/Director Signature: Dr Andrew McLaren
Date of Last Modifications: 04 August 2025

(MAE template updated June 2025)

MODULE TIMETABLE

Module Code:	**16259**	**Module Title:**	**Aero-Design 1**

Brief Description of Assessment:

- Two online, time constrained quizzes with 40% contribution towards the final module mark (20% for each quiz) – shown as 'Online Test' below
- One examination with 60% contribution towards the final module mark

Assessment Timing:-

Indicated on the table below are the start/submission dates for each assignment/project and the timing of each exam/assessment.

Please note: Timings could change during unforeseen periods of disruption; this should only be used as a guide.

Semester Two	C&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.	Online Test	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.	Online Test	Exam