

# MODULE DESCRIPTION FORM



## DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

### 16309 AERO-DESIGN 2

<b>Module Registrar:</b> Dr M Stickland <a href="mailto:matt.stickland@strath.ac.uk">matt.stickland@strath.ac.uk</a>	<b>Taught To (Course):</b> Cohorts for whom class is compulsory		
<b>Other Lecturers Involved:</b>	<b>Credit Weighting:</b> 20 (ECTS 10)	<b>Semester:</b> 2	
<b>Assumed Prerequisites:</b> 16351 Flight and Spaceflight 2	<b>Compulsory class</b>	<b>Academic Level:</b> 3	<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
		200							200

#### Educational Aim

It is essential that students should have experience in applying engineering principles in a design context. It is the aim of this class to have students experience the application of knowledge, gained primarily from previous classes, to various stages of the design process together with new knowledge gained as part of project completion.

#### Learning Outcomes

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

- LO1 Generate a deeper understanding of flight mechanics and aerodynamics
- LO2 Develop a concept from inception to detail design level
- LO3 Realise the crucial need for time-planning and scheduling
- LO4 Appreciated design as a process of iteration

#### Syllabus

The module will teach the following:

The class consists of a semester-long design/build/test group exercise.

The projects available each year will depend upon the staff involved in this class. A typical project which might be available is:

#### **For student who have completed 16351 Flight and Spaceflight 2: SU “Weight Lifter Challenge”**

Groups from 16351 will take their design developed in semester 1 build it, test it and take part in a competition to see who can design an aircraft with the largest payload to empty mass ratio. Over the 12 weeks of the semester, the groups will develop their design, build, test and optimise the design. The aircraft are taken by the teams to fly off in the competition to be held in May. A small budget is allocated to each group.

**Please note that group participation is dependent on satisfactory peer mark in 16351.**

#### **For students returning from exchange: SU pound lifter challenge**

Groups of approximately 5 students will design, build and test a small scale glider aircraft to take part in a competition to see who can design a glider within specified limits that can carry the largest mass the furthest distance when launched from a specified height. Over the 12 weeks of the semester, the groups will develop their design, build, test and optimise the design. A small budget will be allocated to each group for the manufacture of their aircraft.

## 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	Generate a deeper understanding of flight mechanics and aerodynamics
C1	By designing the model aircraft the students will demonstrate a deeper understanding
LO2	Develop a concept from inception to detail level
C1	Creation of the aircraft will demonstrate the students' ability to take a design from concept through to detailed design
LO3	Realised the crucial need for time-planning and scheduling
C1	Create a Gantt chart to demonstrate time and project planning
C2	Keep a log book to demonstrate individual time and project planning
LO4	Appreciated design as a process of iteration
C1	After initial flight test, demonstrate understanding of performance, identifying and implementing modifications to the design as required

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/staff/policies/academic/> )

Please state briefly how these are incorporated in this module.

Assessment is carried out at the end of the semester on the following basis:

Individual Logbook (including organisation of time) + technical log	10%
Design Presentation	10%
Peer Mark	20%
Report	35%
Overall Design/build quality/Performance	25%

Feedback will be provided throughout the semester by:

- Informal discussion about the group's aircraft's design and manufacture.
- Constructive criticism of the group presentation.
- Comments on the technical content and presentation of the group's final report

A final mark will not be awarded until the group technical log is complete.

NB: A peer mark will be taken every two weeks and a student with a peer mark below 50% will be given an individual oral examination to establish why they are not contributing to the project. If a student does not contribute to the progress of the group an individual project may be assigned at any time during the semester. The size of this project will depend on when it is set.

At the BMFA competition the students will be required to give a presentation to a group of industry experts and submit a report for marking by the competition judges.

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

Examination				Coursework		Practical		Project	
Number	Month(s)	Duration	Weighting	Number	Weighting	Number	Weighting	Number	Weighting
								1	100%
*				*		*		* LO1-LO4	

\* **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*):** To be confirmed

**Resit Assessment Procedures:**

Requirement to carry out an additional design project as agreed with the Class Registrar and assessed by submission of alternate coursework in the form of a design report prior to commencement of the August exam diet.

**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 by the August diet. This re-assessment will consist an additional design project and submission of a design report. No marks from any previous attempts will be transferred to a new resit attempt.

**Recommended Reading**

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

\*\* "Aircraft Performance" by Mair and Birdsall, Cambridge, ISBN 0521362644

or

\*\* "Aircraft Performance and Design" by Anderson, McGraw Hill, ISBN 0-07-001971-1

**Additional Student Feedback**

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

Date	Time	Room No
		Check timetable webpages for details

Session: 2019/20

**Approved:**

**Course Director Signature:** Dr Stuart Grey

**Date of Last Modifications:** 30/8/19

## MODULE TIMETABLE

Module Code:

16309

Module Title:

Aero-Design 2

### Brief Description of Assessment:

Individual Logbook (including organisation of time) + technical log	10%
Design Presentation	15%
Peer Mark	20%
Report	35%
Overall Design Assessment/Performance	20%

Exact timings of assessments will be communicated during the 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 and will 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.

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.	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.	Present ation Report Log book	Choose an item.