



## MODULE DESCRIPTION FORM

### DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

## ME107 Experimental and Laboratory Skills

<b>Module Registrar:</b> Dr Annalisa Riccardi <a href="mailto:annalisa.riccardi@strath.ac.uk">annalisa.riccardi@strath.ac.uk</a>	<b>Taught To (Course):</b> Cohorts for whom class is compulsory		
<b>Other Lecturers Involved:</b>	<b>Credit Weighting:</b> 10	<b>Semester:</b> 1 and 2	
<b>Assumed Prerequisites:</b> SQA Highers in Mathematics and Physics (or equivalent)	<b>Compulsory/ optional/ elective class</b>	<b>Academic Level:</b> 1	<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
1		2	12		10		25	50	100

#### Educational Aim

The aim of the class is to introduce students to a range of experimental and laboratory related skills, appropriate to Mechanical and Aerospace Engineering. This will include elements of laboratory and workshop safety including risk assessment procedures. Students will develop an understanding of how to conduct experiments, record data, evaluate errors and write a technical report.

#### Learning Outcomes

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

LO1 Understand and appreciate safety in the laboratory

LO2 Have experience of carrying out a simple risk assessment and have an appreciation for safe working practices in the laboratory

LO3 Have an appreciation for the conduct of experimental work, recording results and evaluating errors

LO4 Have experience of writing a formal report in the correct style, including graphical representations of data, and appropriate referencing of literature

LO5 Appreciate the use of online activities as part of their learning process

#### Syllabus

The module will teach the following:

a) Report writing in the appropriate style, including error analysis and referencing.

b) Assessment of risk and its management.

c) How to conduct experiments related to core classes in the first year Mechanical Engineering curriculum. The two labs are "aerodynamic forces" (lift and drag forces for different aerofoil shape) and "digital image processing" (grey level transformations).

## 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, LO2

C1 Students will produce an individual risk assessment for online submission

C2 Students will understand what is meant by the terms “hazard” and “control measures” and be able to describe them activity with which they have experience.

#### LO3

C1 Students should carry out experimental procedures and record raw data accurately

C2 Students should plot experimental data graphically

C3 Students should comment on the possible sources of errors in their measurements and make suggestions for their minimisation

#### LO4

C1 Students will write two formal laboratory reports in an appropriate style

C2 Students will include references to previous work in a correct format and style

C3 Students will use diagrams and graphs with appropriate cross referencing from the text and adequate captions

C4 Students will draw justifiable conclusions from the results of their experiments and discuss them with reference to appropriate background information and theory

#### LO5

C1 Students will analyse and discuss their results.

C2 Students will undertake an online quiz to assess their learning outcomes in “digital image processing” and “aerodynamic forces” topics

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/>)

#### Help clarify what good performance is.

Exemplars of good quality student reports will be available for students to consult as they formulate their own work. These will be annotated to highlight good practice over the range of learning outcomes.

#### Deliver high quality feedback information that helps learners self-correct:

High quality written feedback will be provided on each activity, particularly on the reports for the experimental labs. This will allow students to improve the quality and style of their technical writing, and gain a set of skills that will stand them in good stead for their degree course.

### 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
				see	below	see	below		
*				*		*		*	

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

Each student will submit the following pieces of work; weightings of marks are shown for information

- Risk Assessment assignment 10% (LO1, LO2)
- Lab session A
  - Pre-lab (lesson and face-to-face discussion forum) 5% (LO5)
  - Technical report 35% (LO3,LO4)
  - Quiz 5% (LO5)
- Lab session B
  - Pre-lab (lesson and face-to-face discussion forum) 5% (LO5)
  - Technical report 35% (LO3, LO4)
  - Quiz 5% (LO5)

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

Deadlines to be advised – will be different for each group/student as he/she moves through the cycle of learning experiences  
The students have 2 weeks from the completion of the laboratory to submit the report and complete the online quiz.  
The pre-lecture activity must be completed prior to the beginning of the experiment.

**Resit Assessment Procedures:**

Submission of alternate <sup>^</sup>coursework(s) 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 during 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**

None

**Additional Student Feedback**

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

Date	Time	Room No
		Check timetable webpages for details

Session: 2020/21

Students will be provided with individual feedback for each sub-task online. Students wishing to receive individual clarification can contact staff who will go through work and provide further information and advice.

**Approved:**

**Course Director Signature:    Dr Stuart Grey**

**Date of Last Modifications:    11 August 2020**

(Updated August 2020)

