

MODULE DESCRIPTION FORM

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

ME107 EXPERIMENTAL AND LABORATORY SKILLS

Module Registrar: Mr Chris Cameron chris.cameron@strath.ac.uk	Taught To (Course): Cohorts for whom class is compulsory		
Other Lecturers Involved: AMRL Staff	Credit Weighting: 10	Semester: 1 and 2	
Assumed Prerequisites: SQA Highers in Mathematics and Physics (or equivalent)	Compulsory	Academic Level: 1	Suitable for Exchange: N

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

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	Total
7	4	2	30		10		15	32	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, evaluating errors and the use of online activities as part of their learning process

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:

- Report writing in the appropriate style, including error analysis and referencing.
- Assessment of risk and its management.
- 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 "Material characterisation and testing".

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 work in groups and 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 “Material characterisation and testing” 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/professionalservices/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.

Summative Assessments include 1x Risk Assessment Assignment (quiz) and 2x scheduled practical laboratories with associated submissions 1 in semester 1 and 1 in semester 2: Students to attend a scheduled lab in semester 1 and 2 during weeks 3-9 depending on their allocated group. Before each lab, students must complete a Pre-lab activity quiz (if not completed students will not be permitted to the lab). After the lab is completed, students have 3 weeks to submit their group report and complete an online time constrained quiz.

Formal feedback for all assignment aspects will only be released when all student assessments have been submitted and marked. As an example, for semester 1, as some group submissions (for those who complete the lab in week 9) are not due until the December examination diet it is likely that feedback will not be provided until the beginning of semester 1. However, this will be provided prior to the semester 2 laboratories in week 3 to allow students to use feedback to improve their next submission.

Informal feedback: Verbal feedback will be provided to the students during the lectures and laboratory and Q&A sessions.

Additional verbal feedback during the on-campus sessions will be given to support that provided by Myplace quiz feedback.

Written feedback will be given via Myplace forum and email to personal inquiries to the lecturers.

Concerns regarding the engagement of group members must be indicated to the module teaching team (listed on the MDF) immediately.

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

Examination				Coursework		Practical	
Number	Month(s)	Duration	Weighting	Number	Weighting	Number	Weighting
				Lab A (see below)	45% s1	see	below
				Lab B (see below)	45% s2		
				1 risk assessment quiz	10% s1		
*				*LO1-LO5		*	

* **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 (time constrained quiz)** 10% (LO1, LO2)
- **Lab session A** (weighting 45%) Breakdown shown below:
 - Pre-lab (online time constrained quiz, face-to-face lessons, and discussion forum) – must be completed by students prior to attending the lab. If not completed, students will not be permitted to attend the lab. 5% (LO5)
 - Technical report (group work/ group submission) 35% (LO3, LO4)
 - Time Constrained Quiz 5% (LO5)
- **Lab session B** (weighting 45%) Breakdown shown below:
 - Pre-lab (online time constrained quiz, face-to-face lessons, and discussion forum) – must be completed by students prior to attending the lab. If not completed, students will not be permitted to attend the lab. 5% (LO5)
 - Technical report (group work/ group submission) 35% (LO3, LO4)
 - Time Constrained Quiz 5% (LO5)

Coursework / Submission deadlines (*academic weeks*):

Information relating to the Risk Assessment Assignment will be delivered during Week 0 Induction week. The assessment (time constrained online quiz) will be due for submission in Week 3 before the laboratories begin.

The pre-lecture/lab quiz (time constrained) for both labs must be completed prior to attending each lab (Week 2 of each semester). If the pre-lab activity is not completed, students will not be permitted to attend their scheduled lab.

Lab A: 1 lab experiment attendance during semester 1 depending on allocated group. This is classed as a scheduled assessment and students must attend their scheduled slot. If student is unable to attend they must submit appropriate personal circumstances.

Students have 3 weeks from the completion of the laboratory to submit their group report. Students have until week 11 to complete the online lab quiz (time constrained) however, students are encouraged to submit this around their report deadline.

Lab B: 1 lab experiment attendance during semester 2 depending on allocated group. This is classed as a scheduled assessment and students must attend their scheduled slot. If student is unable to attend they must submit appropriate personal circumstances.

Students have 3 weeks from the completion of the laboratory to submit their group report. Students have until week 11 to complete the online lab quiz (time constrained) however, students are encouraged to submit this around their report deadline.

Resit Assessment Procedures:

Submission of ^coursework(s) prior to commencement of the July/August exam 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 during the July/August exam diet. This re-assessment will consist entirely of a 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

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.

Session: 20240/25

Approved:

Programme Lead/Director Signature: Dr G Houston-Scott and Dr A McLaren

Date of Last Modifications: 21/08/2024

(MAE template updated July 2024)

MODULE TIMETABLE

Module Code:

ME107

Module Title:

Experimental and Laboratory Skills

Brief Description of Assessment: Each student will submit the following pieces of work; weightings of marks are shown for information.

- Time constrained quiz (via Myplace): Risk Assessment assignment 10% of the total mark
- Lab session A: Pre-lab time constrained quiz (via Myplace) 5%; Technical report 35% (group activity); Time constrained lab quiz (via Myplace) 5%
- Lab session B: Pre-lab time constrained quiz (via Myplace) 5%; Technical report 35% (group activity); Time constrained lab quiz (via Myplace) 5%

Students to attend a scheduled lab in semester 1 and 2 during weeks 3-9 depending on their allocated group. Students have 3 weeks from the completion of the laboratory to submit their group report. Students have until week 11 of each semester to complete the online lab quizzes however, students are encouraged to submit this around their group's report deadline.

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 One	W&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Risk Assessment Online Test Opens	Pre-Lab A Online Test Opens	Pre-Lab A Online Test Due	Risk Assessment Online Test Due	Choose an item. Choose an item.	Lab A Online Test Opens	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.	Lab A Online Test Due

Semester Two	C&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Pre-Lab B Online Test Opens	Pre-Lab B Online Test Due	Choose an item. Choose an item.	Choose an item. Choose an item.	Lab B Online Test Opens	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.	Lab B Online Test Due

Each student will attend one lab session in semester 1 **and** one lab session in semester 2, which will take place between weeks 3 – 9.

A separate timetable will confirm dates for lab attendance.

The pre-lab activity must be completed prior to lab attendance.