MODULE DESCRIPTION FORM

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

16132 ENGINEERING MECHANICS 1

Module Registrar: Dr R Hamilton r.hamilton@strath.ac.uk	**Taught To (Course): Cohorts for whom module is compulsory**		
Other Lecturers Involved: Prof B Wynne	**Credit Weighting: 20 (ECTS 10)**	**Semester: 1 and 2**	
Assumed Prerequisites: SQA Highers in Mathematics and Physics (or equivalent)	**Compulsory module**	**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**
50	36						20	94	200

Educational Aim

A study of mechanics gives you the basic tools to understand how the world, both natural and man-made, works - if you take the time to do this carefully, you will be well prepared for more advanced studies in mechanical engineering. Knowledge of mechanics is a fundamental tool for a mechanical engineer. Our purpose is to understand what has become known as classical mechanics. The concepts of classical mechanics you will deal with include a study of forces, motion, energy, work, momentum and heat, how these are connected, and how these ideas can be applied to engineering problems. The ideas behind classical mechanics changed the human race absolutely and forever. Most historians agree that no discovery in human thought has been more influential.

Students come to engineering mechanics with an elementary understanding of the basic principles of mechanics acquired from introductory school physics together with their application to problem solving. This class places more emphasis on the basic skills (see Specific Outcomes below) required to start to apply these concepts and principles to real engineering problem solving. The class focuses on the practice of these skills, rather than factual content. In this class doing required background reading, coming to class and doing homework are like practising for a football team (or musical group, using a simple analogy). The tutor/lecturer is less a source of information and more of a coach (or conductor) who structures practice and sets standards. Students' progress not by absorbing (and regurgitating) information but rather by practising their skills individually and learning to work effectively with others. The exams are like league games (or concerts) where students test their skills in a situation where performance counts.

Learning Outcomes

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

LO1 Have understood and overcome any misconceptions about basic concepts in physics (force, energy, work etc).

LO2 Restate existing problem-solving skills in a form more suitable for engineering applications

LO3 Interpret basic engineering applications of mechanics in more detail.

LO4 Acquire four basic thinking skills:

- Perceive, or resolve, contradictions involving their preconceptions about mechanics
- Organise the basic ideas of mechanics in a form suitable for problem solving
- Apply basic principles in mechanics to realistic engineering situations
- Solve realistic engineering problems

Syllabus

The module will teach the following:

Statics; frameworks; friction; velocity and acceleration; inertia and change of motion; motion in a circle; balancing; periodic motion; dynamics of rotation; work, energy and power; impulse and momentum.

More detail can be found in the Class Text (see below).

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 Participation during in-class discussion using polling systems
C2 Able to correctly answer concept questions in class tests

LO2
C1 Use of structured problem-solving frameworks – written submissions & class tests
C2 Able to recognise type of problem and apply appropriate structured problem-solving strategy, including diagrammatic representation, conceptual representation (including free body diagrams, assumptions) and (symbolic) mathematical solution.

LO3
C1 Participation during in-class discussion using polling systems.
C2 Should be able to read an engineering problem and recognise the various assumptions which have to be made to apply a particular mathematical model for solution.

LO4
C1 Correct use of a structured problem-solving method appropriate to the problem at hand.

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/)

Formative Assessment is given in multiple forms: in-class polling systems, self-assessment using polling systems.

Summative Assessment is given in multiple forms: written homework using structured problem solving (assessed with an online quiz) and two examinations.

Immediate self-directed feedback through in-class polling systems
Online feedback from online quiz (Time constrained quiz) within 3 weeks.
General in class verbal feedback from Dec exam within first 3 weeks of semester 2.

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	Dec Apr/May	1 hrs 1 hrs	45% 45%	1	10% (s1)				
* LO1 & LO3 & LO4				* LO1 & LO2		*		*	

* ***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*):
Coursework deadline semester 1 week 8.

Resit Assessment Procedures:
2hr examination in July/August 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 during the July/August diet. This re-assessment will consist entirely of an exam. No marks from any previous attempts will be transferred to a new resit attempt.

Recommended Reading

Purchase recommended **Highly recommended reading *For reference (do NOT purchase) * **OpenStax College Physics:** Available free online from openstaxcollege.org and in class site in Myplace

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: 11 August 2025

(MAE template updated June 2025)

MODULE TIMETABLE

Module Code:	**16132**	**Module Title:**	**Engineering Mechanics 1**

Brief Description of Assessment:

Homework question as online quiz in week 8 semester 1.

Written exams at the end of both semesters.

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
	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.	Course work Set	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.	Exam

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.	Choose an item. Choose an item.	Exam