Module Definition Form (MDF)

Module code: MOD009156	**Version:** 4 **Date Amended:** 05/Jun/2026

1. Module Title
Engineering Dynamics

2a. Module Leader
Hossein Bisheh

2b. School
School of Engineering and the Built Environment

2c. Faculty
Faculty of Science and Engineering

3a. Level
4

3b. Module Type
Standard (fine graded)

4a. Credits
15

4b. Study Hours
150

5. Restrictions

Type	Module Code	Module Name	Condition
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:			

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

Gain knowledge and fundamental understanding of vector mathematics and its application to particle and rigid body dynamics. You'll start by learning the terminologies, definitions, and applications of the dynamics. The module covers kinematics in one and two dimensions, including the relations between displacement, velocity, and acceleration of an object. It also includes kinetics in one and two dimensions, examining the relationships between force and acceleration applied on an object. As a student, you can apply these principles to many design process applications, including machine and mechanism designs.

6b. Outline Content

- Basic concepts in dynamics
- Fundamentals of vector mechanics and its application to dynamics
- Kinematics and Kinetics of particles
- Kinematics and Kinetics of rigid bodies
- Applying all the concepts to a real-world engineering problem

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources

Computer room with MATLAB

7. Learning Outcomes (threshold standards)

No.	Type	On successful completion of this module the student will be expected to be able to:
1	Knowledge and Understanding	Distinguish applications of elements of machine dynamics in a design process; understand definitions and categorisation of engineering dynamics
2	Knowledge and Understanding	Illustrates understanding of key principles related to particle and rigid body dynamics, and solve complex problems
3	Intellectual, practical, affective and transferrable skills	Apply knowledge of mathematics and engineering principles to solve complex problems in machine dynamics
4	Intellectual, practical, affective and transferrable skills	Conduct computer simulations, compare, and justify the results with respect to the theoretical methods in the context of complex machine dynamic problems

8a. Module Occurrence to which this MDF Refers				
Year	**Occurrence**	**Period**	**Location**	**Mode of Delivery**
2026/7	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	**Hours**	**Learning Outcomes**	**Details of Duration, frequency and other comments**
Lectures	30	1-3	Three hours per week for ten weeks
Other teacher managed learning	6	4	Three hours per week for two weeks, Computer lab activity
Student managed learning	114	1-4	Self-managed study, engage with formative assessment, and preparing assessment report
TOTAL:	150		

9. Assessment for the above Module Occurrence

The assessment for some modules includes a presentation (see below for details on how this particular module is assessed). We recognise that presenting, especially to a large group, can cause significant anxiety or distress for some students. If this may affect you, please contact your Module Leader or the Disability and Neurodiversity Service as early as possible. We will work with you to consider appropriate reasonable adjustments. Depending on your individual needs, these might include, for example, presenting to a smaller group or presenting only to a member of academic staff.

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
010	Examination	1-3	50 (%)	Fine Grade	30 (%)
Examination: 1.5 hours (maps to Engineering Council Learning Outcome C1)					

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
011	Practical	1-4	50 (%)	Fine Grade	30 (%)
20-min group oral presentation of the group project (with individualised marks) followed by 5 minutes of Q&A, associated with the requirements of Engineering Council Learning Outcome C12 (Equivalent to maximum 1500 words)					

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]