

## MODULE DESCRIPTOR

### Module Title

Statics and Dynamics

Reference	EN1700	Version	6
Created	August 2021	SCQF Level	SCQF 7
Approved	March 2004	SCQF Points	15
Amended	August 2021	ECTS Points	7.5

### Aims of Module

To enable the student to understand the basic concepts and theories of applied mechanics.

### Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Understand the concept of equilibrium and determine the actions of forces and moments; identify and explain tensile and compressive loading and the associated linear stress-strain relationship.
- 2 Analyse forces and moments on beams and pin-jointed structures.
- 3 Evaluate the kinematics of simple translation and rotational systems, kinetics of rigid bodies and apply the concepts of work, power and energy.
- 4 Define and calculate friction force, mass moment of inertia and the dynamics of simple systems.
- 5 Investigate experimentally the mass moment of inertia and mechanical properties of materials.

### Indicative Module Content

Statics: Forces, moments and equilibrium. Load analysis of plane, pinned frames (trusses). Shear forces and bending moments in beams. Simple tensile, compressive and linear-elastic material behaviour. Dynamics: Rectilinear and curved path motion of particles including non-constant acceleration case. Newton's Laws applied to rigid body kinetics of linear and circular motion systems including the effect of friction. Mass moment of Inertia. Impulse and momentum.

### Module Delivery

The module is delivered by means of lectures, tutorials and guided self-study and is integrated with applications within the laboratory.

<b>Indicative Student Workload</b>	Full Time	Part Time
Contact Hours	50	50
Non-Contact Hours	100	100
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
<b>TOTAL</b>	<b>150</b>	<b>150</b>
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

**ASSESSMENT PLAN**

*If a major/minor model is used and box is ticked, % weightings below are indicative only.*

**Component 1**

Type: Coursework Weighting: 50% Outcomes Assessed: 5  
 Description: Laboratory based coursework.

**Component 2**

Type: Examination Weighting: 50% Outcomes Assessed: 1, 2, 3, 4  
 Description: In-class assessment and closed book examination.

**MODULE PERFORMANCE DESCRIPTOR**

**Explanatory Text**

The module has 2 components and to gain an overall pass a minimum D grade must be achieved in each component. The component weighting is as follows: C1 is worth 50% and C2 is worth 50%.

		Examination:						
		A	B	C	D	E	F	NS
Coursework:	<b>A</b>	A	A	B	B	E	E	
	<b>B</b>	A	B	B	C	E	E	
	<b>C</b>	B	B	C	C	E	E	
	<b>D</b>	B	C	C	D	E	E	
	<b>E</b>	E	E	E	E	E	F	
	<b>F</b>	E	E	E	F	F	F	
	<b>NS</b>	Non-submission of work by published deadline or non-attendance for examination						

**Module Requirements**

Prerequisites for Module	None in addition to the course entry requirements.
Corequisites for module	None.
Precluded Modules	None.

**INDICATIVE BIBLIOGRAPHY**

1	HEARN, E.J., 1997. Mechanics of Materials: Volume 1. 3rd ed. Oxford: Butterworth-Heinemann.
2	MERIAM, J.L. and KRAIGE, L.G., 2016. Engineering Mechanics (Statics and Dynamics). 8th ed. New York: Wiley.
3	CLIFFORD, M., 2009. Introduction to Mechanical Engineering Part 1. London: Hodder Education.