

## MODULE DESCRIPTOR

### Module Title

Statics and Dynamics

Reference	EN1700	Version	4
Created	January 2017	SCQF Level	SCQF 7
Approved	March 2004	SCQF Points	15
Amended	June 2017	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 the mechanical properties of materials using a tensile test.
- 6 Investigate the method of determining mass moment of inertia of complex material shapes.

### 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, 6
Description:	Two laboratory based courseworks.				

### Component 2

Type:	Examination	Weighting:	50%	Outcomes Assessed:	1, 2, 3, 4
Description:	In-class assessment (20% weighting) and a closed book examination (30% weighting).				

## MODULE PERFORMANCE DESCRIPTOR

### Explanatory Text

To pass the module students must achieve at least a grade D AND a minimum of 35% in the exam and coursework components.

Module Grade	Minimum Requirements to achieve Module Grade:
<b>A</b>	=>70%
<b>B</b>	60-69%
<b>C</b>	50-59%
<b>D</b>	40-49%
<b>E</b>	35-39%
<b>F</b>	0-34%
<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., 2012. Engineering Mechanics (Statics and Dynamics). 7th ed. New York: Wiley.
- 3 CLIFFORD, M., 2009. Introduction to Mechanical Engineering Part 1. London: Hodder Education.