

MODULE DESCRIPTOR

Module Title

Mechanics of Solids

Reference	EN2701	Version	7
Created	August 2021	SCQF Level	SCQF 8
Approved	March 2004	SCQF Points	15
Amended	August 2021	ECTS Points	7.5

Aims of Module

To enable the student to extend their understanding of the basic concepts and theories of Mechanics of Solids and apply them in the areas of stress and structural analysis.

Learning Outcomes for Module

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

- 1 Identify and analyse beam bending behaviour and the linear stress-strain and deflection relationships associated with statically determinate and indeterminate loading.
- 2 Analyse complex stresses and strains in two-dimensions and explain the relationships between elastic constants.
- 3 Explain and analyse torsional loading in shafts and shear stresses in beam bending.
- 4 Evaluate strain energy methods to the load analysis of simple structures.
- 5 Investigate experimentally the deflection of beams and report on the findings.

Indicative Module Content

Beam bending theory and the bending equation; properties of plane areas; beam deflection for statically determinate and indeterminate loading; stress-strain relationships in two-dimensions and Mohr's circle techniques; strain gauge rosettes; relationships between elastic constants; torsion of circular section shafts; shear stresses in beams due to bending; introduction to strain energy methods in structural analysis.

Module Delivery

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

Indicative Student Workload	Full Time	Part Time
Contact Hours	50	50
Non-Contact Hours	100	100
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
<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: 30% Outcomes Assessed: 5
 Description: Laboratory investigation and a written report.

Component 2

Type: Examination Weighting: 70% Outcomes Assessed: 1, 2, 3, 4
 Description: 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 30% and C2 is worth 70%.

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

Module Requirements

Prerequisites for Module	Statics and Dynamics (EN1700) or equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

- 1 HEARN, E.J., 1997. Mechanics of Materials Vol 1. 3rd ed. Oxford: Butterworth-Heinemann.
- 2 BENHAM, P.P., CRAWFORD, R.J. and ARMSTRONG, C.G., 1996. Mechanics of Engineering Materials. 2nd ed. London: Longman.
- 3 HIBBELER, R.C., 2017. Mechanics of Materials. 10th ed. Upper Saddle River, NJ: Prentice-Hall.