

Module Title Mechanics Of Solids Keywords Bending stresses and deflection, torsion, properties of areas, complex stresses, shear stresses, strain energy	Reference	EN2701
	SCQF	SCQF 8
	Level	
	SCQF Points	15
	ECTS Points	7.5
	Created	December 2003
	Approved	March 2004
	Amended	August 2011
	Version No.	3

This Version is No Longer Current

The latest version of this module is available [here](#)

Prerequisites for Module	Indicative Student Workload		
Statics and Dynamics (EN1700) or equivalent.		Full	Part
	<i>Contact Hours</i>	Time	Time
	Lectures	20	20
	Supervised	3	3
Corequisite Modules	laboratory		
None.	Tutorial	20	20
	<i>Directed Study</i>		
	Coursework		
Precluded Modules	preparation	40	40
	Directed		
None.	self-study	30	30
	<i>Private Study</i>		
	Private study	37	37
Aims of Module	Mode of Delivery		
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.	The module is delivered by means of lectures, tutorials and guided self-study and is integrated with applications in the laboratory.		
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. Identify and explain torsional loading and the linear stress-strain relationship for statically determinate and indeterminate loading.
4. Evaluate shear stresses due to bending.
5. Apply strain energy methods to the load analysis of simple structures.

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

Assessment Plan

	Learning Outcomes Assessed
Component 1	1,2,3
Component 2	1,2,3,4,5

Component 2 is a closed book examination (50% weighting).

Component 1 consists of two items of coursework - a laboratory and an analytical investigation (25% weighting each).

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.

stresses in beams due to
bending; introduction to strain
energy methods in structural
analysis.