MECH H3005: Mechanics of Materials

Module Title:	Mechanics of Materials
Language of Instruction:	English

Credits:	5

NFQ Level:	7

Module Delivered In	2 programme(s)

Module Aim:	To provide the student with an understanding of the mechanisms of failure of materials under load. To provide the student with an understanding of the displacement of structures under load.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Describe stress at a point within a material.
LO2	Predict the behaviour and/or failure of mechanical systems subjected to loads.
LO3	Apply models of stress and strain to representative systems in order to determine relationships between loads and the corresponding deflection.
LO4	Develop finite element models of simple structures to solve for load, deflection and stress.
LO5	Quantify, by calculation and experimental measurement, the characteristic response of mechanical systems.

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*
No requirements listed

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Module Content & Assessment

Indicative Content
Stress strain relations. Plane stress Mohr's stress circle Three dimensional stress.
Failure Criteria Rankine, Tresca & von Mises Failure criteria. Stress concentrations.
Slope & deflection of beams Integration method, Macaulay functions.
Finite Element Method Introduction to stiffness matrices. Finite elements, Co-ordinates systems Types of elements. Manual analysis of simple structures.

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	30.00%
End of Module Formal Examination	60.00%

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	Class Test	1,2,3	10.00	Week 6

No Project

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Labs: Deflection of Beams, Statically indeterminate beams. Lab report and assessment	3,5	15.00	Week 8
Practical/Skills Evaluation	Computer Competencies Assignment	3,4	15.00	End-of-Semester

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	Terminal Examination	1,2,3,4	60.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	12 Weeks per Stage	4.00
Laboratory	12 Weeks per Stage	1.00
Independent Learning	15 Weeks per Stage	4.33
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EMMEC_B	Bachelor of Engineering (Honours) in Mechanical Engineering	5	Mandatory
CW_EEMEC_D	Bachelor of Engineering in Mechanical Engineering	5	Mandatory