

MECH H3602: Mechanics of Materials 2

Module Title:			Mechanics of Materials 2			
Language of Instruction:		n:	English			
Credits		5				
orcuits.		0				
NFQ Level:		7				
Module Deli	Module Delivered In 1 programme(s)					
Teaching & Learning Strategies:			his module will be taught by Lectures, Tutorials & Practical Tasks.			
Module Aim:			The student will be able to compute standard structural calculations and describe standard structural practices related to aviation.			
Learning Ou	itcomes					
On successf	ul completio	n of th	nis module the learner should be able to:			
LO1	Evaluate t	he gei	neral design concepts of an aircraft structure			
LO2	.02 Calculate minimum beam sizes from shear and bending moment calculations.					
LO3	LO3 Predict the behaviour and/or failure of mechanical systems subjected to loads.					
LO4	Apply soft	ware a	applications to predict the behaviour of mechanical systems subjected to loads.			
Pre-requisite learning						
Module Recommendations This is prior learning (or a practical skill) that is recommended before enrolment in this module.						
No recomme	ndations list	ted				
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

Airframe Structures - General Concepts

Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail safe, safe life, damage tolerance concepts; Zonal and station identification systems; fatigue; Drains and ventilation provisions; System installation provisions; Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments; Structure assembly techniques: bonding; Methods of surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks

Airframe Structures - Aeroplanes

Fuselage (ATA 52/53/56): Construction and pressurisation sealing; Wing, stabiliser, pylon and undercarriage attachments; Seat installation and cargo loading system; Doors and emergency exits: construction, mechanisms, operation and safety devices; Windows and windscreen construction and mechanisms Wings (ATA 57) Construction; Fuel storage; Landing gear, pylon, control surface and high lift/drag attachments Stabilisers (ATA 55) Construction; Control surface attachment Flight Control Surfaces (ATA 55/57) Construction and attachment; Balancing - mass and aerodynamic Nacelles/Pylons (ATA 54) Nacelles/Pylons: - Construction; - Firewalls; - Engine mounts

Beams

Simply supported, cantilver, Shear Force and Bending Moment diagrams, Section properties, Section modulus, selection of beams.

Deflection of Beams

Double integral method, Macaulay's Method.

Cylinders (Thin Walled and Thick Walled) Hoop stress, axial stress, Lamé's theorm.

Truss analysis:

Method of Joints review and Method of Sections.

Slender Columns

Euler theory for slender columns, buckling for pin ended and or fixed ended

Numerical Methods

Simpsons method, Trapezoidal method

Assessment Breakdown	%
Continuous Assessment	80.00%
Practical	20.00%

Continuous Assessment

	Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
	Examination	A short examination that may be administered through the college VLE.	1	10.00	Week 5
	Written Report	Students will the asked to make a report based on some numerical analysis of a structural problem.	2,3,4	35.00	Week 7
	Examination	An in class test.	1,2,3	35.00	Week 10

No Project

Practical				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Each student will complete a range of practical tasks, administered during term time.	1,2,3	20.00	Every Week

No End of Module Formal Examination

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	2.00		
Practicals	12 Weeks per Stage	2.00		
Independent Learning	15 Weeks per Stage	5.13		
	Total Hours	125.00		

Module Delivered In					
Programme Code	Programme	Semester	Delivery		
CW_EEAER_B	Bachelor of Engineering (Honours) in Aerospace Engineering	5	Mandatory		