Faculty of Engineering & Technology

Structural Mechanics

Information :

Course Code :	MAN 331	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Department of Mechanical Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	AMR MOHAMED METWALLY ISMAIEL	6
Teaching Assistant	Donia Waheed Mohamed Abdelmonem Saleem	

Area Of Study :

Prepare student to apply the principles of static equilibrium to the analysis of structures such as pressure vessels, beams, and torsional members.
Develop studentsôknowledge about buckling and deflection concepts.
Train student to organize the given inputs and formulate a plan to solve engineering problems.

Description :

Displacement and deflections, statically indeterminate structures, Energy methods ap-plied to bar problems, Buckling of columns, Curved beams, Analysis of bars of thin walled sections in shear, Transverse shear, torsion, shear center, Analysis of axisymmetric shells: thin walled cylinders, spheres, cones, discontinuity stresses, Introduction to structural analysis by matrix methods, Stresses in elastic structures with applications.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Define the main theories of elastic failure and their applications
2 -	Explain the principles of stress analysis in shafts and thin cylinders.
3 -	Describe the basic theories and principles of buckling and deflection in beams
4 -	Recognize the concept of safety factors in structural analysis of mechanical elements.
b.Intellectual Skills: :	
1 -	Create innovative ways to solve structural analysis problems.
2 -	Analyze data and design experiments to obtain optimum design conditions.
3 -	Evaluate results of buckling, deflection to ensure safety of mechanical elements.
c.Professional and Practical Skills: :	
1 -	Apply concepts of buckling, deflection of beams and columns to solve engineering problems.
2 -	Apply different theories of elastic failure to analyze stress on shaft of thin cylinder.
d.General and Transferable Skills: :	
1 -	Demonstrate efficient IT capabilities.

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2 -	Efficiently manage tasks, time and resources.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Thin walled cylinders	12	6	6
Buckling of columns	10	6	4
Displacement and deflections in beams ï integration method	6	2	4
Transverse shear, torsion, shear center	10	6	4
Displacement and deflections- virtual work method	8	4	4
Stresses in elastic structures with applications.	4	2	2
Statically indeterminate structures	4	2	2
Project follow -up.	6	2	4

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Discussion
Project

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignment	5.00		
Final Exam	40.00		
Mid- Exam 1I	15.00		
Mid- Exam I	15.00		
Participation	5.00		
Quizzes	10.00		
Report	10.00		

Course Notes :

2. Lecture notes on the course Moodle page, FUE website.

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