

Faculty of Engineering & Technology

Mechanics of Solids

Information :

Course Code : SCM 536

Level : Undergraduate

Course Hours : 3.00- Hours

Department : Department of Structural Engineering & Construction Management

Area Of Study :

Upon successful completion of this course, the student should be able to:

- Understand the basic concepts and main principles
- Calculate the values of the essential terms

Regarding inelastic behavior of materials stress tensors & strain analysis constitutive relations symmetry in elasticity boundary value & two dimensional problems bending & torsion of bars axi-symmetric problems

Description :

Tensor analysis, Stress tensors, Strain analysis, Constitutive relations for linear elastic materials, Symmetry in elasticity, Experimental determination of elasticity constants, Boundary value problems, Two-dimensional problems in elasticity, Bending of prismatic bars, Torsion of bars and hollow shafts, Axisymmetric problems of elasticity, Introduction to inelastic behavior of materials

Course outcomes :

a.Knowledge and Understanding: :

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| 1 - | Define the main terms of inelastic behavior of materials |
| 2 - | Explain the principals of symmetry in elasticity |
| 3 - | Describe the main concept of boundary value & two dimensional problems |

b.Intellectual Skills: :

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| 1 - | Analyze the system of inelastic behavior of materials |
| 2 - | Calculate the values of stress tensors & strain analysis |
| 3 - | Analyze the system of boundary value & two dimensional problems |
| 4 - | Calculate the values of bending & torsion of bars |
| 5 - | Solve problems regarding axi-symmetric problems |

c.Professional and Practical Skills: :

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| 1 - | Prepare technical reports for constitutive relations |
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d.General and Transferable Skills: :

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| 1 - | Search for information and self-learning discipline |
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Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
inelastic behavior of materials of materials	10	6	4

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
stress tensors & strain analysis Strain analysis	5	3	2
constitutive relations elastic materials	10	6	4
symmetry in elasticity Experimental determination of elasticity constants	10	6	4
boundary value & two dimensional problems dimensional problems in elasticity	15	9	6
bending & torsion of bars Torsion of bars and hollow shafts	15	9	6
axi-symmetric problem elasticity	10	6	4
Revision	4	3	1

Teaching And Learning Methodologies :

Interactive Lec.
Discussion
Problem Solving
Report / Present.

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Final exam	40.00		
First Mid Term Exam	15.00		
Quizzes / Assig.	15.00		
Report / Present.	15.00		
Second Mid Term Exam	15.00		

Course Notes :

Lecture Notes on Moodle

Recommended books :

"Mechanics of solids and materials", Robert Asaro, Vlado Lubarda, Cambridge, 2006