MME: Mechanics of Solids Lab

Programme: B. Tech. (MME) Year: 2nd Semester: III Semester
Course: Core Credits: 1 Hours: 2 / week

Course Context and Overview (100 words):

The objective of the Mechanics of Solids lab is to demonstrate the basic principles in the area of strength and mechanics of materials and structural analysis to the undergraduate students through a series of experiments. In this lab the experiments are performed to measure the properties of the materials such as impact strength, tensile strength, compressive strength, hardness, ductility etc.

Prerequisites Courses: Nil

(Course name and course code)

Course outcomes (Cos):

On completion of these experiments, the students will have the ability to:	
CO1 Understand and Operate various types of testing machines	Experiment 1
C02 Configure a testing machine to measure tension or compression behavior	Experiment 2
C03 Compute engineering values (eg. stress or strain) from laboratory measures	Experiment 2, 3, 4
C04 Analyze a stress versus strain curve for modulus, yield and strength	Experiment 5,
C05 Identify modes of failure	Experiment 6, 7, 8, 9
C06 Write a technical laboratory report	All, Experiments

List of Experiments:

S. No.	**Experiments**	**Hours**	**Student development**
1	To Study the various component parts of the Universal Testing Machine (U.T.M.) & test procedures of various practical's to be performed.	**2**	Employability and Skill Development

2	To conduct a tensile test on a mild steel specimen and determine the following: (i) Limit of proportionality (ii) Elastic limit (iii) Yield strength (IV) Ultimate strength (v) Young's modulus of elasticity (VI) Percentage elongation (vii) Percentage reduction in area.	**2**	Employability and Skill Development
3	To conduct Brinnel hardness test on various heat treated mild steel specimen.	**2**	Employability and Skill Development
4	To conduct Rockwell hardness test on various heat treated mild steel specimen.	**2**	Employability and Skill Development
5	To conduct torsion test on mild steel specimens to find out modulus of rigidity	**2**	Employability and Skill Development
6	To determine the impact strength of steel by Izod impact test	**2**	Employability and Skill Development
7	To determine the impact strength of steel by charpy impact test	**2**	Employability and Skill Development
8	To determine metal to metal wear of various specimen	**2**	Employability and Skill Development
9	To determine the failure limit for mild steel sheet	**3**	Employability and Skill Development

Text Books:

1. Engineering Mechanics of Solids by Popov, Egor P, 2nd edition
2. James M. Gere, Stephen Timoshenko, "Mechanics of materials". 2nd Edition.
3. "Mechanics of Materials" Dr. B.C. Punmia, Arun Kr. Jain

Reference books:

1. Beer, Johnston & Dewolf," Mechanics Of Materials", Tata McGraw-Hill Education
2. Mechanics of materials by J. M. Gere. 6th edition

Additional Resources (NPTEL, MIT Video Lectures, Web resources etc.):

Evaluation Methods:

Item	Weightage
Practical File	30
Final Examination (Experiment and Viva voce)	70

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