II YEAR-I Semester

ME3L2 MECHANICS OF SOLIDS & METALLURGY LAB Credits: 2

Lecture: Internal assessment: 25marks

Lab Practice: 3 period/week Semester end examination: 50 marks

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Course Objectives:

- To familiarize the students with the use equipments to determine mechanical properties of materials to acquire the knowledge in Material Testing.

Course outcomes

Upon the completion of this course the student will be able to:

1. Apply methods to determine Mechanical properties and Elastic Constants
2. Appraise the students with the use of testing machines
3. Characterize the microstructures of different ferrous and non ferrous metals.
4. Identify the effect of heat treatment and cooling rates on the properties of steels

Pre-Requisites: Engineering Mechanics

Twelve Experiments out of the following are to be performed

(6 from MOS Lab and 6 from Metallurgy Lab):

1. Tension Test on UTM - Determination of the strength, percentage elongation and percentage reduction in area of the given specimen
2. Deflection Test on Simply supported beam - Determination of Young's modulus of Simply Supported beam material
3. Deflection Test on Cantilever beam - Determination of Young's modulus of cantilever beam material
4. Torsion Test – Determination of modulus of rigidity of circular rod
5. Brinnell's Hardness Test - Determination of Hardness Number for given specimen
6. Rockwell Hardness test - Determination of Hardness Number for given specimen
7. Izod Impact Test - Determination of impact strength of given specimen
8. Charpy Impact Test - Determination of impact strength of given specimen

9. Tests on helical spring - Determination of Modulus of Rigidity of Helical spring material
10. Double shear Test - Determination of shear strength of given specimen
11. Preparation and study of the microstructure of Iron and steels
12. Preparation and study of microstructure of Cast Irons
13. Preparation and study of the microstructure of Copper and its alloys
14. Preparation and study of microstructure of Aluminum and its alloy
15. Study of microstructure of various treated and untreated steels.
16. Hardenability of Steels by Jominy end Quench test.
17. Hardness of various treated and untreated steels.