MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

DEPARTMENT OF MECHANICAL ENGINEERING

2040376 MATERIAL SCIENCE AND MECHANICS OF SOLIDS LAB

B.Tech.II Year-II Sem **L/T/P/C**
0/0/2/1

VISION

The Mechanical Engineering Department strives for immense success in the field of education, research and development by nurturing the budding minds of young engineers inventing sets of new designs and new products which may be envisaged as the modalities to bring about a green future for humanity"

MISSION

Equipping the students with manifold technical knowledge to make them efficient and independent thinkers and designers in national and international arena. Encouraging students and faculties to be creative and to develop analytical abilities and efficiency in applying theories into practice, to develop and to disseminate new knowledge. Pursuing collaborative work in research and development organizations, industrial enterprises, research and academic institutions of national and international standards, to introduce new knowledge and methods in engineering teaching and research in order to orient young minds towards industrial development.

LIST OF EXPERIMENTS

1. Preparation and study of crystal models for simple cubic, body centered cubic, face centered cubic and hexagonal close packed structures.
2. Preparation and study of the Microstructure of pure metals like Iron, Cu and Al.
3. Preparation and study of the Microstructure of Mild steels, low carbon steels, high – C steels.
4. Study of the Microstructure of Cast iron.
5. Study of the Microstructure of Non Ferrous Alloys.
6. Hardenability of steels by Jominy End Quench Test.
7. Direct tension test.
8. Bending test on Simple supported beam.
9. Bending test on Cantilever beam.
10. Torsion test.
11. Brinell hardness test/Rockwell hardness test.
12. Test on springs.
13. Izod Impact test/Charpy Impact test.

COURSE OUTCOMES

CO	Course outcome
ME 376.1	Provide fundamental knowledge based on associated materials properties.
ME 376.2	Provide fundamental knowledge based on selection and application.
ME 376.3	Students would acquire and develop skills for careers in material related industries.
ME 376.4	Analyze the behaviour of the solid bodies subjected to various types of loading.
ME 376.5	Analyze and interpret laboratory data relating to behaviour of structures and the materials.
ME376.6	Apply knowledge of materials and structural elements to the analysis of simple structures.

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PROGRAM EDUCATIONAL OBJECTIVES

PEO1	Graduates shall emerge as successful Mechanical engineer's as their career progress
PEO2	**G**raduates apply fundamentals of engineering, in practical applications and engage in active research.
PEO3	**Mechanical Graduates** shall have the ability to design products with interdisciplinary skills.
PEO4	**G**raduates will serve the society with their professional skills

PROGRAM SPECIFIC OUTCOMES

PSO1- Students acquire necessary technical skills in mechanical engineering that make them employable graduate.

PSO2- An ability to impart technological inputs towards development of society by becoming an Entrepreneur.

LIST OF EQUIPMENTS

1. Cubic Structure – BCC, FCC,HCP
2. Samples: Ferrous metals– Mild steel, Stainless steel, High carbon steel, Alloy steel.
3. Samples: Non Ferrous – Carbon and its alloys, Aluminium and its alloys.
4. Disc Polishing machine
5. Belt Polishing machine
6. Muffle furnace
7. Jominy End Quench Test
8. Universal Testing Machine
9. Bending test on Simple supported and Cantilever beam.
10. Torsion Testing Machine
11. Brinnel hardness testing machine / Rockwell hardness testing machine
12. Spring testing Machine
13. Izod / charpy impact testing machine

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Do's

- Enter laboratory with appropriate laboratory uniform and shoes.
- Keep all your belongings in the book rack or at the place suggested by lab instructor.
- Bring the laboratory manual, observation and record without fail.
- Collect the instruments and check for damage if any before carrying out the experiment.
- Eliminate potentially dangerous chemical reactions by thoroughly washing beakers, test tubes, flasks
- and other glassware before and after use. Always add concentrated chemical (e.g. acid or base) to water NOT water to concentrated chemical.
- Make sure that all equipment is clean and returned to its original place after performing experiments.
- Turn off all heating apparatus, gas valves, and water faucets when not in use.
- Wear disposable gloves, as provided in the laboratory, when handling hazardous materials.
- Remove the gloves before exiting the laboratory.

Don'ts

- Don't place glassware near edge of laboratory bench.
- Don't let water drip onto power strips.
- Never point the open end of a test tube containing a substance at yourself or others.
- Don't use mobile phones during laboratory hours.
- Don't fool around in the laboratory.
- Don't come with long hair, dangling jewelry and loose or baggy clothing which are a hazard in the laboratory.