



# VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

(Accredited by NAAC & NBA, Approved by AICTE New Delhi & Permanently Affiliated to JNTUH)  
Aziznagar Gate, C.B. Post, Hyderabad – 500 075

## DEPARTMENT OF MECHANICAL ENGINEERING II B.Tech I Semester METALLURGY & MATERIAL SCIENCE LABORATORY (A13383) MECHANICS OF SOLIDS LAB

**OUTCOMES:** Upon the completion of the lab the students should be able to

- 1 Understand the micro structures of pure metals, steels, cast irons, non-ferrous alloys and heat treated steels.
- 2 Estimate the harden ability of steels by Jominy End Quench test.
- 3 Determine the hardness of various treated and untreated steels by using Brinells hardness test & Rockwell hardness test.
- 4 Conduct the direct tension test, torsion test, impact test and punch shear test on metal rod.
- 5 Perform compression tests on spring and cube, bending test on Simply Supported and Cantilever Beam.





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## LIST OF EXPERIMENTS

### (A). MECHANICS OF SOLIDS LAB:

1. Direct tension test
2. Torsion test
3. Hardness test
  - A. Brinells hardness test
  - B. Rockwell hardness test
4. Test on springs
5. Compression test on cube
6. Impact test
7. Punch shear test

## LIST OF EQUIPMENT

S.No.	NAME OF THE EQUIPMENT	QUANTITY
1	Universal Testing Machine	01
2	Impact Testing Machine	01
3	Torsion Testing Machine	01
4	Rockwell Hardness Testing Machine	01
5	Brinell Hardness Testing Machine	01
6	Spring Testing Machine	01
7	Beam Bending Test Equipment	01

### (B) METALLURGY LAB:

#### LIST OF EXPERIMENTS

1. Preparation and study of the micro structure of pure metals like iron , cu and Al.
2. Preparation and study of the microstructure of mild steels, low carbon steels, high-C steels
3. Study of the microstructure of Cast Irons
4. Study of the microstructure of Non -Ferrous alloys
5. Study of the microstructure of Heat treated steels
6. Hardenability of steels by Jominy End quench test
7. To find out the hardnes of various treated and untreated steels

#### LIST OF EQUIPMENT:

S.No.	NAME OF THE EQUIPMENT	QUANTITY
1	Binocular Research Microscopes	06
2	Specimen Cut Off Machine	01
3	Heat Treatment Machine (5"X5"X12") With Digital Temperature Control	01
4	Jominy End Quench Test Apparatus	01
5	Belt Grinding Machine	01
6	Polishing Stands	01
7	Disc Polisher 10" Double Disc	01
8	Specimen Mounting Press With Timer In Two Parts	01