

Course Title: MATERIALS TESTING LABORATORY [As per Choice Based Credit System (CBCS) scheme] SEMESTER – III			
Subject Code	15CVL37	IA Marks	20
Number of Lecture Hours/Week	03	Exam Marks	80
Total Number of Lecture Hours	42	Exam Hours	03
CREDITS – 02			
Course objectives:			
The objectives of this course is to make students to learn:			
<ol style="list-style-type: none"> 1. Ability to apply knowledge of mathematics and engineering in calculating the mechanical properties of structural materials. 2. Ability to function on multi-disciplinary teams in the area of materials testing. 3. Ability to use the techniques, skills and modern engineering tools necessary for engineering. 4. Understanding of professional and ethical responsibility in the areas of material testing. 5. 5. Ability to communicate effectively the mechanical properties of materials. 			
Modules	Teaching Hours	Revised Bloom's Taxonomy (RBT) Level	
1. Tension test on mild steel and HYSD bars.	03 Hours	L₂, L₃, L₅	
2. Compression test on mild steel, cast iron and wood.	03 Hours	L₁, L₂, L₃, L₅	
3. Torsion test on mild steel circular sections.	03 Hours	L₁, L₂, L₃, L₅	
4. Bending Test on Wood Under two point loading	03 Hours	L₁, L₂, L₃, L₅	
5. Shear Test on Mild steel- single and double shear	03 Hours	L₁, L₂, L₃, L₅	
6. Impact test on Mild Steel (Charpy & Izod)	03 Hours	L₁, L₂, L₃, L₅	
7. Hardness tests on ferrous and non-ferrous metals – Brinell's, Rockwell and Vicker's	06 Hours	L₁, L₂, L₃, L₅	
8. Tests on Bricks and Tiles	03 Hours	L₁, L₂, L₃, L₅	
9. Tests on Fine aggregates – Moisture content, Specific gravity, Bulk density, Sieve analysis and Bulking	06 Hours	L₁, L₂, L₃, L₅	
10. Tests on Coarse aggregates – Absorption, Moisture content, specific gravity, Bulk density and Sieve analysis	06 Hours	L₁, L₂, L₃, L₅	
11. Demonstration of Strain gauges and Strain indicators	03 Hours	L₁, L₂, L₃, L₅	
<i>NOTE: All tests to be carried out as per relevant latest BIS Codes</i>			

Course outcomes:

After successful completion of the course, the students will be able to:

1. Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension, compression, shear and torsion.
2. Identify, formulate and solve engineering problems of structural elements subjected to flexure.
3. Evaluate the impact of engineering solutions on the society and also will be aware of contemporary issues regarding failure of structures due to unsuitable materials.

Program Objectives (as per NBA)

1. *Engineering Knowledge.*
2. *Evaluation of mechanical properties of structural materials.*
3. *Interpretation of test results.*

Question paper pattern:

- Group experiments - Tension test, compression test, torsion test and bending test.
- Individual Experiments - Remaining tests.
- Two questions are to be set - One from group experiments and the other as individual experiment.
- Instructions as printed on the cover page of answer script for split up of marks to be strictly followed.
- All exercises are to be included for practical examination.

Reference Books:

1. Davis, Troxell and Hawk, "Testing of Engineering Materials", International Student Edition – McGraw Hill Book Co. New Delhi.
2. M L Gambhir and Neha Jamwal, "Building and construction materials- Testing and quality control", McGraw Hill education(India)Pvt. Ltd., 2014
3. Fenner, " Mechanical Testing of Materials", George Newnes Ltd. London.
4. Holes K A, "Experimental Strength of Materials", English Universities Press Ltd. London.
5. Suryanarayana A K, "Testing of Metallic Materials", Prentice Hall of India Pvt. Ltd. New Delhi.
6. Kukreja C B, Kishore K. and Ravi Chawla "Material Testing Laboratory Manual", Standard Publishers & Distributors 1996.
7. Relevant IS Codes