

**COURSE TITLE** : MATERIAL TESTING LAB  
**COURSE CODE** : 414  
**COURSE CATEGORY** : A  
**PERIODS/WEEK** : 3  
**PERIODS/SEMSTER** : 54  
**CREDITS** : 2

### TIME SCHEDULE

| MODULE | TOPIC  | PERIODS   |
|--------|--|-----------|
| I      | Tension test on “MS/Torsteel” rod<br>Compression test on clay brick<br>Impact tests – Izod and Charpy<br>Hardness tests – Brinell and Rock well<br>Torsion test – M.S. and Brass rods                                    | 31        |
| II     | Bending test on wooden beams<br>Compression test on wood<br>Shear test on steel rods and brass rods<br>Test on springs – open coiled and close coiled<br>Deflection test on beams<br>Water absorption test on clay brick | 23        |
|        | <b>TOTAL</b>   | <b>54</b> |

### OBJECTIVES

- 1.1.1 Conduct tension test on ‘Steel’ rods of different grade and find the yield stress, ultimate stress, breaking stress and young’s modulus of steel:[IS 1608-1972; IS 432-1966]
- 1.1.2 Conduct compression test on clay bricks of standard size and specification and calculate the compressive stress of the same; { IS 3495- 1992-PART-1]
- 1.1.3 Conduct Izod and Charpy impact tests on respective standard specimens of steel and find the energy required to break the same [IS 1499-1977; IS1598- 1977; IS 3766-1966]
- 1.1.4 Conduct Brinell and Rockwell hardness tests on the standard specimens and calculate the hardness numbers of respective items.[ IS 1500- 1968; IS 1586-1968; IS 3804-1966]
- 1.1.5 Conduct torsion test on a mild steel and a brass rods and plot the graph ‘torque’ against ‘angle of twist in radians’. From the graph calculate modulus of rigidity of the materials; steel and brass:
- 2.1.6 Conduct bending test on wooden beams and plot a graph ‘load’ against ‘deflection’ and from the graph find the young’s modulus of wood. Also find the max, fiber stress at Breaking point:[IS 1708- 1969; IS 883- 1970]
- 2.1.7 Conduct compression test on wood; and find the permissible compressive stress of wood allowing a factor of safety ‘2’
- 2.1.8 Conduct double shear test on steel and brass rods and calculate the respective shear stress Capacities[IS 5242 -1969]
- 2.1.9 Conduct loading tests on ;open coiled and closed coiled helical springs and plot graphs ‘load’ against, ‘deflection’ and calculate the modulus of rigidity of material of springs by using the graph
- 2.1.10 Conduct deflection test on steel and brass beams and calculate the young’s module of the two materials by drawing graphs “load” against ‘deflection’
- 2.1.1 Conduct water absorption test on clay brick and find the % water absorbed by it after 24 hours of dipping in water. Compare the value with IS specification [IS 3475- 1992- PART-2; IS 1077-1992]