

## BASIC MECHANICAL ENGINEERING

Theory L/T (Hours per week): 3/0, Credit: 3

### **MODULE-1**

#### **Thermodynamics: (9 classes)**

Systems, Properties, Process, State, Cycle, Internal energy, Enthalpy, Zeroth Law, First law and Second Law of Thermodynamics, Basic Concept of Entropy, Properties of ideal gas., Properties of pure substances, Steam formation, Types of Steam, Enthalpy, Specific volume, Internal energy and dryness fraction of steam, use of Steam tables. Related numerical.

### **MODULE-2: ( 11 classes)**

#### **Application of Thermodynamics:**

Air compressors, Steam Power Plant, Refrigerators and Heat pump, I.C. Engines (Brief Description of different components of above mentioned systems and working principles with Schematic diagram only)

#### **Introduction to Fluid Mechanics and Heat transfer:**

Fluid properties, Pascal's law, Buoyancy, Bernoulli's theorem, pipe flow, hydraulic turbines and pumps. Different modes of heat transfer, heat exchangers (basics).

### **MODULE-3(8 classes)**

#### **Production processes**

Turning, Casting, Welding and forming (Drawing, Forging, Extrusion) (working principles with Schematic diagram only)

#### **Engineering materials:**

Classification of Engineering materials. Mechanical properties of Steel, Aluminum and Plastics.

### **MODULE-4 (8 classes)**

#### **Fasteners and Power transmission devices:**

Nut, Bolt, Screw, Rivets, Belt, Rope, Gear drives. Coupling, clutch, brakes. (Basics, applications, advantages and limitations only).

#### **Mechanical Measurements:**

Temperature, pressure, velocity, flow, strain, force, torque measurements. (Working principle only).

### **Text books**

1. Basic Mechanical Engineering by Pravin Kumar, Pearson
2. Basic Mechanical Engineering by A R Israni, P K Shah, BS Publications
3. Text book of Elements of Mechanical Engineering, S T Murthy, Universities press

### **Reference books**

1. Basic Mechanical Engineering by .D. Mishra, P.K Parida, S.S. Sahoo, India Tech Publishing company
2. Engineering Thermodynamics by P. Chattopadhaya, Oxford University Press
3. Basic and applied Thermodynamics by P. K. Nag, Tata McGraw Hill
4. Elements of Mechanical Engineering by J K Kittur and G D Gokak, Willey
5. Basic Mechanical Engineering by Basant Agrawal, C M Agrawal, Willey