Course Plan and Evaluation

1. Course Code	**: ME110**
2. Course Title	**: Elements of Mechanical Engineering**
3. L.T.P	**: 2 -0-0**
4. Credits	**: 2**
5. Prerequisite	**: Nil**
6. Teaching department	**: Mechanical Engineering Department**

Course Objectives:

Understanding the basics of IC engines, refrigeration and air-conditioning, turbines, manufacturing processes (casting, machining), welding, soldering and brazing etc., different types of drives.

Course Outcomes:

Graduates will be able to

- Demonstrate basic knowledge in mathematics, science and engineering.
- Demonstrate the ability to develop a mechanical system or a process with desired specifications and requirements.
- Ability to identify, formulate and solve mechanical engineering problems.
- Confidence to apply engineering solutions in global and societal contexts.
- Ability to employ effective project management skills to develop a project plan.

Course Contents

Module – 1: Mechanics
Introduction to Mechanical Engineering, Emerging Trends and Its role,
Mechanics: Statics and dynamics, Moments, Stress-strain diagram, tension, compression, bending. **03**

Module – 2: Mechanical drives
Introduction to different drives, Belt drive, Chain drive, Gear drive, Gear trains. **03**

Module – 3: Prime movers and compressors **6 (3+2+1)**
Sources of Energy, power generation systems.
Heat Engines – Classifications, I.C engines – Components – Terminology, working of Two & Four stroke: diesel and petrol engine with PV diagram, Comparison between petrol & diesel; two & four stroke engines,

Turbines: Introduction to turbines, Types of turbines, steam turbines, classification, working, Compounding of steam turbines, Gas Turbines, Jet Propulsion, Jet Engines, Water Turbines.

Compressors: types, working principle, Calculation of work requirement for reciprocating compressor.

Module 4: Refrigeration: **04**
Introduction to Refrigeration, Terminology,Working principle – refrigeration cycles, Vapour compression and vapour absorption systems, COP, Properties of Refrigerant.

Module – 5: Manufacturing

Casting- Types and Methods, Steps in making sand castings, Cope and drag, Gating system, Patterns, Core making, Casting defects, Advantages and disadvantages of casting, Introduction to machine tool; Lathe: Functions of different parts, Operations: Turning, Taper turning (compound rest), boring, thread cutting, knurling, facing, drilling; Drilling machine and operations; Welding, Brazing, Soldering,

Reference books:

1. Elements of Mechanical Engineering – K. R. Gopalkrishna
2. An introduction to Mechanical Engineering – J. Wickert
3. Elements of Mechanical Engineering – Roy and Choudhary
4. Elements of Mechanical Engineering – A A Kale and Karad
5. Elements of Mechanical Engineering – V.K. Manglik
6. Basic and applied thermodynamics- PK Nag

Evaluation:

- Test, Quizzes, Assignments – 30%,
- Mid semester exam – 20%,
- End Semester Exam – 50%