

ELEMENTS OF MECHANICAL ENGINEERING

Course Code: 13ME1101

L	T	P	C
4	0	0	3

Course Outcomes:

At the end of the course student will be able to

- CO 1** Recognize types of wood and wood working tools
- CO 2** Identify the types of patterns and moulding methods
- CO 3** Name different power plants and describe their function.
- CO 4** Classify I.C. Engines, identify the parts of engine, and determine the efficiency of petrol and diesel engines.
- CO 5** Explain terminology, classification of air conditioning systems and determine COP of refrigeration.

UNIT-I

(12 Lectures)

WOOD AND WOOD WORKING:

Structure of wood – grain in wood – seasoning of wood – carpentry tools – marking and measuring tools – cutting tools and planes – striking and holding tools – carpentry procedures: marking, sawing, planing, chiseling, boring, grooving – wood working machines.

FOUNDRY:

Introduction - pattern materials, types, pattern making tools. core prints, core boxes, moulding tools and equipments, moulding sands, sand additives, properties of moulding sand. functions of runner, riser and gates, preparation of sand moulds. outline of sand casting.

UNIT-II

(12 Lectures)

BENCH WORK AND FITTING:

Introduction - vices, hammers, chisels, files, hacksaw, marking tools and accessories, drilling operations, tapping.

SMITHY AND FORGING:

Introduction to black-smithy - operations - types of forging - hand tools and appliances - smith forging operations.

sheet metal working: Introduction - metals used in sheet metal work.

sheet metal hand tools - sheet metal operations.

Lathe: Major components and basic operations.

UNIT-III**(12 Lectures)****POWER PLANTS:**

Layout of steam, hydel, nuclear, diesel and gas turbine power plants – major components and their functions.

Power transmission: Types of drives – belt drives – flat and v belts– spur and helical gears– gear trains – simple and compound.

UNIT-IV**(12 Lectures)****I.C.ENGINES:**

Introduction, classification of I.C. engines, I.C. engine-parts and terminology, four stroke cycle engines –petrol and diesel, two stroke cycle engines – petrol and diesel, comparison between four stroke and two stroke cycle engines, comparison between petrol engine and diesel engine.

UNIT-V**(12 Lectures)****REFRIGERATION AND AIR CONDITIONING:**

Refrigeration – unit of refrigeration and C.O.P. – principle of vapour compression systems – types of refrigerants.

Air conditioning – terminology – classification – summer air conditioning for hot and dry weather – winter room air conditioner.

TEXT BOOKS:

1. K.VenuGopal and V.PrabhuRaja, “*Basic Mechanical Engineering*,” 10th Edition, Anuradha Agencies, 2011.
2. S.K.Hajra Choudary and A.K. Hajra Choudary, “*Elements of Workshop Technology*”, Vol1: Manufacturing Processes,2007.

REFERENCES:

1. Basant Agarwal and C.M. Agarwal, “*Basic Mechanical Engineering*,” 3rd Edition, Wiley India, 2011.
2. R.K. Rajput, “*Basic Mechanical Engineering*,” 3rd Edition, University Science Press, 2012

