7th Semester	RME7D001	Power Plant Engineering	L-T-P 3-0-0	3 Credits

Module I: **(10 hours)**

1. INTRODUCTION

Different sources (Conventional and non-conventional) of energy and the principle of power generation only, Types of power plant and site selection, overall view of a steam power plant.

2. STEAM GENERATOR

Fossil fuel steam generators, classification, circulation in water tube boilers, Modern high pressure water tube boilers (both sub critical and super critical), Boiler mounting and accessories, Combustion equipment: air supply systems (Natural and Mechanical Draught Systems). Pulverized coal burning systems and Basics of Fluidized bed combustion, Feed water treatment (Necessity & general consideration only). Boiler performance calculations.

Module II: **(8 hours)**

3. FLOW THROUGH NOZZLES

Types of nozzles and their area of application & related calculation, critical pressure & chocked flow, super saturated flow. Effect of friction and nozzle efficiency

4. STEAM TURBINES

Turbine types, Variation of Pressure and Velocity in different types of turbines, Simple impulse Turbines, Flow through turbine blades and velocity diagram, Pressure - compounded impulse turbines and Velocity compounded impulse turbines. Turbine power and related calculations.

Module III: **(10 hours)**

5. REACTION TURBINES

Reaction turbines Flow through blades and velocity diagram, degrees of reaction, Parsons turbine, power and related calculations, Blade height calculations, Losses in steam turbines, Reheat factor & condition line, Governing of turbines.

6. STEAM CONDENSER & CIRCULATING WATER SYSTEMS

Types, Surface condenser, Performance calculation, Air removal methods, Vacuum & vacuum efficiency. Cooling towers. (types, principle of operation and performance)

Module IV: **(8 hours)**

7. NUCLEAR POWER PLANT

Introduction, Nuclear fuels, Nuclear fission, Reactor components, & materials and classification,, Boiling Water Reactor (BWR), Pressurized water Reactor (PWR),CANDU Reactor, Gas cooled Reactors, Liquid metal fast breeder Reactor. Heavy water Reactors .Waste disposal and Safety of Nuclear power plant

8. ECONOMICS OF POWER PLANT

Basic definitions, cost of electrical energy (Fixed cost and operating cost), Types of tariff, Types of loads (typical load curves), Economic Load sharing

Books:

1. Power plant Engineering ; - By P.K. Nag (2nd edition) TMH
2. Power Plant Engineering by Arora and Domkundwar, Dhanpat Rai publications
3. Power Plant Engineering by Yadav
4. Power Plant Engineering by Rajput
5. Power plant Technology : By E.I. Wakil TMH
6. Power Plant Engineering by C.Elanchezhian, Sarvanakumar, Vijayramnath, IK International Publishing House Pvt Ltd.