|  |  |  |
| --- | --- | --- |
| Course No | Course Name | L-T-P-Credits |
| **EE 216** | **Power Plant Engineering** | **3-0-0: 3** |
|  Prerequisite: nil Co requisite: nil |
| **Course Objectives**:1. To understand different types of power plant, its functions, their flow lines and related issues.2. To analyse, solve energy and economic related issues in power sectors. |
|  **SYLLABUS** |
| **Module** | **Contents** | **Hours** |
| I | **Power Plants – Coal:**Rankine cycle – improvisations, Layout of modern coal power plant, Super Critical Boilers, FBC Boilers, Turbines, Condensers, Steam & Heat rate, Subsystems of thermal power plants – Fuel and ash handling, Draught system, Feed water treatment, Binary Cycles and Cogeneration systems. | 09 |
| II | **Power Plants – Diesel, Gas and Combined Cycle:**Otto, Diesel, Dual & Brayton Cycle – Analysis & Optimisation, Components of Diesel and Gas Turbine power plants, Combined Cycle Plants, Integrated Gasifier based Combined Cycle systems. | 07 |
| III | **Power Plants – Nuclear:**Basics of Nuclear Engineering, Layout and subsystems of Nuclear Power Plants, Working of Nuclear Reactors: Boiling Water Reactor (BWR), Pressurized Water Reactor (PWR), CANada Deuterium- Uranium reactor (CANDU), Breeder, Gas Cooled and Liquid Metal Cooled Reactors, Safety measures for Nuclear Power plants. | 08 |
| IV | **Power Plants – Renewable Sources :** Hydro Electric Power Plants – Classification, Typical Layout and associated components including Turbines, Principle, Construction and working of Wind, Tidal, Solar Photo Voltaic (SPV), Solar Thermal, Geo Thermal, Biogas and Fuel Cell power systems. | 07 |
| V | **Economic and Environmental Issues:**Power tariff types, Load distribution parameters, Load curve, Comparison of site selection criteria, relative merits & demerits, Capital & Operating Cost of different power plants, Pollution control technologies including Waste Disposal Options for Coal and Nuclear Power Plants. | 05 |

**Essential Readings:**

1. P. K. Nag, “Power Plant Engineering”, Tata McGraw – Hill Ltd., Third Edition, 2008.
2. Black and Veatch, “Power Plant Engineering”, Springer, 1996.

**Supplementary Readings:**

1. M. M. El-Wakil, “Power Plant Technology”, Tata McGraw – Hill Ltd., 2010.
2. Thomas C. Elliott, Kao Chen and Robert C. Swanekamp, “Standard Handbook of Power Plant Engineering”, McGraw – Hill, Second Edition, 1998.
3. Godfrey Boyle, “Renewable Energy”, Open University and Oxford University Press, 2004.