

10 ME 42C POWER PLANT ENGINEERING (SI UNITS)

IV B.Tech II Semester

(with effect from the academic year 2013-2014)

*Lectures/week: 4 Hrs.
University Exam: 3 Hrs*

*Credits: 4
Sessional Marks: 40
End Examination Marks: 60*

UNIT-I

Steam Power Plants: Introduction, flow diagram of steam power plants.

Cycles: Reheat – Regeneration – Binary Vapour cycle.

Fuel Supply and Analysis: Coal types – Coal sampling – Proximate analysis – Ultimate analysis – Ash – fusion temperature – Grind ability – Coking and coking characteristics – weathering index – reporting of coal analysis – Fuel oil and its analysis – Gaseous fuels.

Fuel System: Mechanical stokers – Pulverized fuel fired furnace – Cyclone furnace – Oil fired system – Supply, handling, storage and preparation of fuels, Introduction to fluidized bed combustion.

UNIT-II

Steam Generators: Classification – Arrangement of heat absorbing surfaces – boiler drum – internal circulation principles – modern trends in boiler – design – boiler performance – boiler draught-furnace construction – steam generator rating – boiler regulation – superheaters – reheaters – economizer and air heaters – types – location – construction and arrangement.

Ash Handling: Dust emissions from boiler furnaces – flyash separators – hydraulic and pneumatic systems of ash handling.

Draft Systems: Draft systems- fan characteristics and selection – draft control – fan drives.

UNIT-III

Steam Turbines: Types and arrangement – Construction and Operation – Governing and Lubrication.

Condensers: Types – Surface condenser – Steam and Water flow arrangement – Construction and materials – Condenser auxiliaries – Steam jet air ejectors – Mechanical Vacuum pumps – Supply of condensing Water – Cooling towers – Circulating Water Pumps.

UNIT-IV

Feed Water System: Feed Water heating cycle – Heater types – heater construction and operation – deaerators – evaporators – condensate and boiler feed pumps.

Instruments and Control: Fuel measurement – flow recorders for feed water – air steam temperature and pressure recorders – draft indicators – drum level indicators – feed water control – combustion control.

UNIT-V

Nuclear Power Plants (brief treatment only): Nuclear physics – the atomic nature of matter – nuclear structure – radioactive decay – transmutation – nuclear fission – nuclear fusion.

Nuclear Reactor Engineering: Basic principles – types of reactors – properties of nuclear fuels – moderators – coolants – control and safety rods – structural materials – radiation hazards – shielding – radio active waste disposal.

TEXT BOOKS:

1. A Course in Power Plant Engineering : Arora S.C. & Domkundwar S.
2. Power Plant Engineering : Rajput R.K

REFERENCES:

1. Power Station Engineering and Economy : Skrotzki & Vopat
2. Steam Power Stations : Gaffert
3. Power Generating Systems : Editors of Power