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CH327 ENERGY ENGINEERING (ELECTIVE - I)

Course Description & Objectives:

The course programme focuses on understanding the sources of energy and their contributions to the energy and power needs of the nation and the world.

Course Outcomes:

The student will be able to

- 1. Understand the present and future energy demands of the energy resources,*
- 2. Know about various energy auditing and energy conservation methods.*
- 3. Obtain in detail knowledge about the stem distribution and utilization.*
- 4. Know about various renewable energy resources.*

UNIT I - Sources of Energy and Types of Fuels

Energy resources present and future, Energy demands with reference to India. Coal: - Origin, occurrence reserves, petrography, rank, classification, analysis, testing, storage, carbonization liquefaction, gasification.

UNIT II - Liquid Fuels: Petroleum

Origin, occurrence, Reserves, Composition, classification, fractionation, reforming cracking, petroleum products, specification for petroleum natural gas, coke oven gas, producer gas, water gas, LPG.

UNIT III - Energy Auditing

Short term, medium term, long term schemes, energy conversion energy index, energy cost, representation of energy consumption, Energy auditing.

UNIT IV - Steam Plant

Run time cycle, boiler plant, steam cost, steam distribution and utilization, combined heat and power cycles. Energy from biomass, gas purification solar energy, wind energy, energy storage, waste heat recovery.

UNIT V- Energy Conservation:

Energy conservation methods in process industries, practical applications and theoretical analysis.

TEXT BOOKS

1. O.P.Gupta, "Elements of Fuels, Furnaces & Refractories", 3rd ed., Khanna Publications, 1996
2. Sami Sarkar, "Combustion", 2nd ed., Orient Longman, 1998.

REFERENCE BOOKS

1. Conventional Energy Technology, Fuel and Chemical Energy, Tata Mc Graw Hill, 1987.
2. G.D.Rai, "Non – Convective Energy Sources", 4th ed., Khanna Publications, 1997.