

**COURSE OBJECTIVES:**

- To minimise energy costs / waste without affecting production & quality.
- To minimise environmental effects.

**UNIT I ENERGY SCENARIO 4**

General Aspects of Energy Conservation, Management and Audit - Fuels and Combustion: Introduction to Fuels, Properties of Fuel oil, Coal and Gas, Storage, handling and reparation of fuels, Principles of Combustion, Combustion of Oil, Coal, and Gas - Insulation: Insulation-types and application, Economic thickness of insulation, Heat savings and application criteria - Cogeneration: Definition, Need, Application, Advantages, Classification, Saving potentials, Industrial Case Studies

**UNIT II ELECTRICAL SYSTEM 3**

Electrical system: Electricity billing, Electrical load management and maximum demand control - Power factor improvement: Power factor improvement and its benefit, Selection and location of capacitors, Performance assessment of PF capacitors, Distribution and transformer losses.

**UNIT III ELECTRIC MOTORS AND COMPRESSED AIR SYSTEM 4**

Types, Losses in induction motors, Motor efficiency, Factors affecting motor performance, Rewinding and motor replacement issues, Energy saving opportunities with energy efficient motors. Compressed air system: Types of air compressors, Compressor efficiency, Efficient compressor operation, Compressed air system components, Capacity assessment, Leakage test, Factors affecting the performance and efficiency

**UNIT IV HVAC AND REFRIGERATION SYSTEM 2**

Vapor compression refrigeration cycle - Refrigerants, Coefficient of performance, Capacity - Factors affecting Refrigeration and Air conditioning system performance and savings opportunities - Vapor absorption refrigeration system: Working principle, Types and comparison with vapor compression system, Saving potential

**UNIT V COOLING TOWER AND LIGHTING SYSTEM 2**

Cooling Tower: Types and performance evaluation, Efficient system operation, Flow control strategies and energy saving opportunities, Assessment of cooling towers  
Lighting System: Light source, Choice of lighting, Luminance requirements, and Energy conservation avenues

**TOTAL: 15 HOURS**

**COURSE OUTCOME:**

**At the end of the course, students will be able to:**

- Acquaintance with conservation of energy and its management, energy planning, and energy economics
- Know-How of energy efficient machinery systems, energy losses and their management.

**REFERENCES:**

- R1. Dr. Clive Beggs, " Technical Literature published by Petroleum Conservation Research Association", Budseworth Heinemann, 2002.  
R2. Albert Treemann & Paul Mehta, " Handbook of Energy Engineering Website of Bureau of Energy Efficiency ", The Fiarmonth Press