

UEE522:ENERGY AUDITING AND MANAGEMENT

L	T	P	Cr
3	1	0	3.5

Course Objective: To make the student understand about the energy scenario and its importance.

Energy Scenario: Energy scenario of growing economy, Energy pricing, Energy sector reforms, Energy and environment, Energy security, Energy conservation and its importance, Energy conservation Act-2001 and its features.

Energy Management and Audit: Energy audit- need, Types of energy audit, Energy management (audit) approach-understanding energy costs, Bench marking, Energy performance, Matching energy use to requirement, Maximizing system efficiencies, Optimizing the input energy requirements, Fuel and energy substitution, Energy audit instruments

Material and Energy Balance: Methods for preparing process flow, Material and energy balance diagrams.

Financial Management: Investment-need, Appraisal and criteria, Financial analysis techniques- Risk and sensitivity analysis, Financing options, Energy performance contracts and role of ESCOs.

Electrical System: Electricity tariff, Load management and maximum demand control, T&D losses. Losses and efficiency in induction motors, Factors affecting motor performance and remedial solutions, energy efficient motors. Light source, Choice of lighting, Luminance requirements, and Energy conservation avenues

Compressed Air System: Types of air compressors, Compressor efficiency, Efficient compressor operation, Compressed air system components, Capacity assessment.

HVAC and Refrigeration System: Vapor compression refrigeration cycle, Coefficient of performance, Capacity, performance and savings opportunities, Vapor absorption refrigeration system: Working principle, Saving potential, Fans, Blowers and pumps- Types, Performance evaluation, Flow control strategies and energy conservation opportunities.

Course Learning Outcomes (CLO):

After the completion of the course the students will be able to:

1. Analyze about energy scenario nationwide and worldwide
2. Decide about energy management in more effective way.
3. Analyze about various energy related aspect of electrical system.
4. Carry out financial management.
5. Conduct studies related to operational aspects of compressed air system and refrigeration system.

Text Books:

1. *Abbi, Y.P. and Jain, S., Handbook on Energy Audit and Environment Management, Teri Bookstore (2006).*
2. *Diwan, P., Energy Conservation, Pentagon Press (2008).*

Reference Books:

1. *Younger, W., Handbook of Energy Audits, CRC Press (2008).*

Evaluation Scheme:

Sr. No.	Evaluation Elements	Weightage (%)
1	MST	30
2	EST	45
3	Sessionals (May include Assignments/Projects/Tutorials/Quizes/Lab Evaluations)	25