

5 th Semester	REL5D002	Electrical Energy Conservation and Auditing	L-T-P 3-0-0	3 Credits
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Electrical Energy Conservation and Auditing

Module I:

(12 Hours)

Electrical energy conservation: Energy economics- discount rate, payback period, internal rate of return, net present value, and life cycle cost. Energy generation, energy distribution, energy usage by processes, technical and economic evaluation, understanding energy costs, classification of energy conservation measures, plant energy performance, benchmarking and energy performance, matching energy usage to requirement, maximizing energy system efficiency, optimizing the input energy requirements, fuel and energy substitution, and energy balancing.

EB billing- HT and LT supply, transformers, electric motors- motor efficiency computation, energy efficient motors, pumps, fans, blowers, compressed air systems, refrigeration and air conditioning systems, cooling towers, electric heaters (space and liquid), DG-sets, illuminating devices, power factor improvement, and harmonics.

Module II:

(12 Hours)

Electrical energy audit: Energy consumption pattern and scenario of any region; Energy auditing: Need, types, methodology and approaches; Preliminary energy audit methodology (initial site visit and preparation required for detailed auditing, detailed energy audit activities, information and data collection, process flow diagram and process steps); Procedure and techniques: Data gathering, evaluation of saving opportunities, and energy audit reporting; and Energy audit instruments.

Module III:

(06 Hours)

Illumination: Illumination, luminous flux, lumen, luminous intensity, candela power, brightness, glare, types of lighting (incandescent, CFL, and LED), requirements of lux for various purposes, determine the method of lighting, select the lighting equipments, and calculate the lighting parameters.

Books:

- [1] Callaghn, P. W.” Design and Management for Energy Conservation”, Pergamon Press, Oxford, 1981.
- [2] Dryden. I. G. C.,” The Efficient Use of Energy”, Butterworths, London, 1982.
- [3] Energy Economics -A. V. Desai (Wiley Eastern).
- [4] Handbook of Energy Efficiency - CRC Press
- [5] Energy Technology, OP Gupta, Khanna Book Publishing
- [6] Handbook of Energy Audits Albert Thumann, William J. Younger, Terry Niehus, 2009.
- [7] Handbook on Energy Audit and Environment Management, Y P Abbi and Shashank Jain, TERI, 2006.