

LESSON PLAN FOR ACADEMIC SESSION: 2026-27(Winter)

Discipline: Electrical Engineering	Semester : 5th	Name of the Teaching Faculty : Subhasmita Sahu (Guest Faculty, Electrical Engg.)
Subject : Energy Conservation & Audit	No. of days / week class allotted	Semester From : 1/07/2026 to 05/11/2026 Nos. of Weeks per semester : 15
Week	Class Day	Theory Topics
1ST	1st	Energy Conservation Basics • Energy Scenario: Primary and Secondary Energy, Energy demand and supply, National scenario.
	2nd	Continue.....
	3rd	Continue.....
2ND	1st	• Energy conservation and Energy audit; concepts and difference
	2nd	• Indian Electricity Act 2001; relevant clauses of energy conservation
	3rd	• BEE and its Roles, MEDA and its Roles
3RD	1st	• Star Labelling: Need and its benefits.
	2nd	Energy Conservation in Electrical Machines • Need for energy conservation in induction motor and transformer. • Energy conservation techniques in induction motor by: • Improving Power quality. • Motor survey
	3rd	• Matching motor with loading. • Minimizing the idle and redundant running of motor. • Operating in star mode. • Rewinding of motor.
4TH	1st	• Replacement by energy efficient motor • Periodic maintenance • Energy conservation techniques in Transformer. • Loading sharing
	2nd	• Parallel operation • Isolating techniques. • Replacement by energy efficient transformers. Periodic maintenance.
	3rd	• Energy Conservation Equipment: Soft starters, Automatic star delta convertor, Variable Frequency Drives, Automatic p. f. controller (APFC), Intelligent p. f. controller (IPFC)
5TH	1st	Continue.....
	2nd	Continue.....
	3rd	• Energy efficient motor; significant features, advantages, applications and limitations.
6TH	1st	• Energy efficient transformers, amorphous transformers; epoxy Resin cast transformer / Dry type of transformer.
	2nd	Continue.....
	3rd	Energy conservation in Electrical Installation systems Aggregated Technical and commercial losses (ATC);
7TH	1st	Power system at state, regional, national and global level.
	2nd	Technical losses; causes and measures to reduce by. a) Controlling I ² R losses. b) Optimizing distribution voltage
	3rd	c) Balancing phase currents d) Compensating reactive power flow Commercial losses: pilferage, causes and remedies

8 TH	1 st	Energy conservation equipment: Maximum Demand Controller , kVAR Controller
	2 nd	Automatic Power Factor controller(APFC)
	3 rd	Energy Conservation in Lighting System a) Replacing Lamp sources. b) Using energy efficient luminaries.
9 TH	1 st	c) Using light controlled gears. d) Installation of separate transformer / servo stabilizer for lighting.
	2 nd	e) Periodic survey and adequate maintenance programs.
	3 rd	Energy Conservation techniques in fans, Electronic regulators.
10 TH	1 st	Energy conservation through Cogeneration and Tariff • Co-generation and Tariff; concept, significance for energy conservation • Co-generation
	2 nd	• Types of cogeneration on basis of sequence of energy use (Topping cycle, Bottoming cycle)
	3 rd	• Types of cogeneration basis of technology (Steam turbine cogeneration, Gas turbine cogeneration, Reciprocating engine cogeneration).
11 TH	1 st	Continue.....
	2 nd	• Factors governing the selection of cogeneration system.
	3 rd	• Advantages of cogeneration.
12 th	1 st	• Tariff: Types of tariff structure: Special tariffs; Time-off-day tariff, Peak-off-day tariff,
	2 nd	• Power factor tariff, Maximum Demand tariff, Load factor tariff.
	3 rd	• Application of tariff system to reduce energy bill.
13 th	1 st	Energy Audit of Electrical System • Energy audit (definition as per Energy Conservation Act)
	2 nd	• Energy audit instruments and their use.
	3 rd	• Questionnaire for energy audit projects.
14 th	1 st	• Energy flow diagram (Sankey diagram)
	2 nd	• Simple payback period, Energy Audit procedure (walk through audit and detailed audit).
	3 rd	Continue.....
15 th	1 st	• Energy Audit report format.
	2 nd	Question discussion
	3 rd	Question discussion

S.S
17.7.26
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