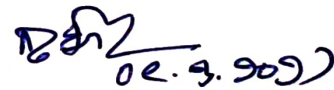


Discipline: Electrical Engg.	Semester: 5th	Name of the Teaching Faculty: NRUSINGH CHARAN BEHERA
Subject: Energy conservation & audit	No. of Days/per week class allotted:3	Semester from date: 01.07.2026 To Date: 05.11.2026 No.ofWeeks:15
Week	Class Day	Theory
1st	1st	Energy Conservation Basics • Energy Scenario: Primary and Secondary Energy, Energy demand and supply, National scenario. BEE and its Roles, MEDA and its Roles
	2nd	• Energy conservation and Energy audit; concepts and difference
	3rd	• Indian Electricity Act 2001; relevant clauses of energy conservation •
2nd	1st	• Star Labelling: Need and its benefits.
	2nd	Energy Conservation in Electrical Machines • Need for energy conservation in induction motor and transformer... • Minimizing the idle and redundant running of motor.
	3rd	• Energy conservation techniques in induction motor by: • Improving Power quality
3rd	1st	• Motor survey • Matching motor with loading
	2nd	• Operating in star mode. • Rewinding of motor. • Replacement by energy efficient motor
	3rd	• Periodic maintenance • Energy conservation techniques in Transformer.
4th	1st	• Loading sharing • Parallel operation • Isolating techniques. • Replacement by energy efficient transformers. Periodic maintenance..
	2nd	• Energy Conservation Equipment: Softstarters, Automatic star delta convertor, Variable Frequency Drives, Automatic p. f. controller (APFC), Intelligent p. f. controller (IPFC)
	3rd	• Energy efficient motor; significant features, advantages, applications and limitations.
	1st	• Energy efficient transformers, amorphous transformers;

5 th		epoxy Resin cast transformer / Dry type of transformer
	2 nd	Energy conservation in Electrical Installation systems
	3 rd	Aggregated Technical and commercial losses (ATC); Powersystem at state, regional, national and global level. Technical losses; causes and measures to reduce by regulators.
6 th	1 st	. a) Controlling I ² R losses. b) Optimizing distribution voltage c) Balancing phase currents d) Compensating reactive power flow Commercial losses:
	2 nd	pilferage, causes and remedies Energy conservation equipment: Maximum Demand Controller , kVAR Controller,
	3 rd	Automatic Power Factor controller (APFC) Energy Conservation in Lighting System a) Replacing Lamp sources. b) Using energy efficient luminaries.
7 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. Energy Conservation techniques in fans, Electronic
	3 rd	Energy conservation through Cogeneration and Tariff • Cogeneration and Tariff; concept, significance for energy conservation
8 th	1 st	• Co-generation • Types of cogeneration on basis of sequence of energy use (Topping cycle, Bottoming cycle
	2 nd	) • Types of cogeneration basis of technology (Steam turbine cogeneration, Gas turbine cogeneration, Reciprocating engine cogeneration).
	3 rd	• Factors governing the selection of cogeneration system. • Advantages of cogeneration.
9 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.
10 th	1 st	Energy Audit of Electrical System
	2 nd	• Energy audit (definition as per Energy Conservation Act)
	3 rd	• Energy audit instruments and their use.
	1 st	• Questionnaire for energy audit projects.
	2 nd	• Energy flow diagram (Sankey diagram)

11 th	3 rd	• Simple payback period, Energy Audit procedure (walk through audit and detailed audit).
12 th	1 st	• Energy Audit report format.
	2 nd	Question discussion
	3 rd	Question discussion
	1 st	Question discussion
13 th	2 nd	Question discussion
	3 rd	Question discussion
14 th	1 st	Question discussion
	2 nd	Question discussion
	3 rd	Question discussion
15 th	1 st	Question discussion
	2 nd	Question discussion
	3 rd	Question discussion


 Signature of the faculty
 (NRUSINGH CHARAN BEHERA)
 Sr. Lect., Electrical