

Discipline: Electrical Engg.	Semester: 3rd	Name of the Teaching Faculty: UMESH CHANDRA SETHI
Subject: Energy Conservation and Audit (EC&A)	No. of Days/Per week class allotted: 03	Semester From Date: 20.07.2026 To Date:5.11.2026 No. of Weeks: 17 Weeks
Week	Class Day	Theory/ Practical Topics
1 st (20/07/2026-25/07/2026)	1st	Unit 1 (Energy Conservation Basics) Energy Scenario: Primary and Secondary Energy
	2nd	Energy demand and supply, National scenario.
	3rd	Energy conservation and Energy audit; concepts and difference
2 nd (26/07/2026-01/08/2026)	1st	Indian Electricity Act 2001; relevant clauses of energy conservation
	2nd	BEE and its Roles
	3rd	MEDA and its Roles
3 rd (02/08/2026-08/08/2026)	1st	Star Labelling: Need and its benefits.
	2nd	Unit 2 (Energy Conservation in Electrical Machines) Need for energy conservation in induction motor and transformer
	3rd	Energy conservation techniques in induction motor by: Improving Power quality, Motor survey
4 th (09/08/2026-15/08/2026)	1st	Matching motor with loading, Minimizing the idle and redundant running of motor.
	2nd	Operating in star mode, Rewinding of motor, Replacement by energy efficient motor
	3rd	Periodic maintenance, Energy conservation techniques in Transformer, Loading sharing
5 th (16/08/2026-22/08/2026)	1st	CLASS TEST
	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)
6 th (23/08/2026-29/08/2026)	1st	Energy efficient motor; significant features, advantages, applications and limitations.
	2nd	Energy efficient transformers, amorphous transformers; epoxy Resin cast transformer / Dry type of transformer.

	3rd	Unit 3 (Energy conservation in Electrical Installation systems) Aggregated Technical and commercial losses (ATC)
7 th (30/08/2026-05/09/2026)	1st	1st INTERNAL ASSESSMENT
	2nd	Power system at state, regional, national and global level.
8 th (06/09/2026-12/09/2026)	1st	Technical losses; causes and measures to reduce by:a) Controlling I ² R losses.
	2nd	b) Optimizing distribution voltage c) Balancing phase currents
	3rd	d) Compensating reactive power flow
9 th (13/09/2026-19/09/2026)	1st	Commercial losses: pilferage, causes and remedies Energy conservation equipment: Maximum Energy Demand Controller, KVAR Controller, Automatic Power Factor controller (APFC)
10 th (20/09/2026-26/09/2026)	1st	Energy Conservation in Lighting System a) Replacing Lamp sources.
	2nd	b) Using energy efficient luminaries. c) Using light controlled gears.
	3rd	d) Installation of separate transformer/servo stabilizer for lighting
11 th (27/09/2026-03/10/2026)	1st	e) Periodic survey and adequate maintenance programs. Energy Conservation techniques in fans, Electronic regulators.
	2nd	Unit 4 (Energy conservation through Cogeneration and Tariff) Co-generation and Tariff; concept, significance for energy conservation : Co-generation
12 th (04/10/2026-10/10/2026)	1st	Types of cogeneration on basis of sequence of energy use (Topping cycle, Bottoming cycle)
	2nd	2nd INTERNAL ASSESSMENT
	3rd	Types of cogeneration basis of technology (Steam turbine cogeneration)
13 th (11/10/2026-17/10/2026)	1st	Gas turbine cogeneration, Reciprocating engine cogeneration
	2nd	Factors governing the selection of cogeneration system. Advantages of cogeneration.
	3rd	Tariff: Types of tariff structure: Special tariffs; Time-of-day tariff, Peak-off-day

		tariff
14 th (18/10/2026-24/10/2026)	1st	Power factor tariff, Maximum Demand tariff, Load factor tariff.
15 th (25/10/2026-31/10/2026)	1st	Application of tariff system to reduce energy bill
	2nd	Unit 5 (Energy Audit of Electrical System) Energy audit (definition as per Energy Conservation Act)
	3rd	Energy audit instruments and their use.
16 th (01/11/2026-05/11/2026)	1st	Questionnaire for energy audit projects.
	2nd	Energy flow diagram (Sankey diagram)
	3rd	Simple payback period
17 th	1st	Energy Audit procedure (walk through audit and detailed audit) Energy Audit procedure (walk through audit and detailed audit)
	2nd	Energy Audit report format.
	3rd	Energy Audit report format.

HOD

ELECTRICAL

UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY
RAYAGADA
DEPARTMENT OF ELECTRICAL ENGINEERING



LESSON PLAN

SEMESTER-5TH

SESSION- WINTER (2026)

SUBJECT: ENERGY CONSERVATION AND AUDIT

NAME OF FACULTY: SRI UMESH CHANDRA SETHI

