R. K. Institute of Engineering and Technology
Approved by AICTE, New Delhi and Affiliated to SCTE&VT,Odisha

ELECTRICAL ENGINEERING

SEMESTER : 5th (SEC-A)

FROM :01/07/2026 **TO** :05/11/2026

NAME OF THE FACULTY : Er. BAILOCHAN BALSAMANT

SUBJECT : ENERGY CONSERVATION AND AUDIT

TOTAL CLASS AVAILABLE IN SEMESTER: 45 nos

NO. OF PERIODS : 03/ WEEK

Class No.	Unit	Topic / Sub-topic	Teaching Method	Learning Outcome
1	I	Course Introduction, Energy Scenario: Primary & Secondary Energy	Lecture + PPT	Explain primary and secondary energy sources
2	I	Energy Demand & Supply, National Energy Scenario	Lecture	Describe India's energy scenario
3	I	Energy Conservation & Energy Audit: Concepts and Differences	Lecture + Discussion	Differentiate energy conservation and energy audit
4	I	Indian Electricity Act 2001: Energy Conservation Provisions	Lecture	Explain relevant legal provisions
5	I	BEE & MEDA: Roles and Responsibilities	Lecture	Describe the functions of BEE and MEDA
6	I	Star Labelling: Need, Benefits & Applications	Lecture + Case Study	Explain the significance of star labelling
7	I	Revision & Unit Test-I	Tutorial + Test	Assess Unit-I learning
8	II	Need for Energy Conservation in Induction Motors & Transformers	Lecture	Explain the importance of energy conservation
9	II	Improving Power Quality & Motor Survey	Lecture	Identify power quality improvement techniques
10	II	Motor Loading & Idle Running Reduction	Lecture + Numerical	Analyze motor loading conditions
11	II	Operating in Star Mode & Motor Rewinding	Lecture	Explain energy-saving practices
12	II	Energy-Efficient Motors: Features, Advantages & Applications	Lecture	Compare standard and energy-efficient motors
13	II	Transformer Energy Conservation: Load Sharing & Parallel Operation	Lecture	Explain transformer energy-saving techniques

Class No.	Unit	Topic / Sub-topic	Teaching Method	Learning Outcome
14	II	Isolation Techniques & Periodic Maintenance	Lecture	Apply maintenance strategies
15	II	Energy Conservation Equipment: Soft Starter & Automatic Star-Delta Converter	Lecture + Demonstration	Explain motor control devices
16	II	VFD, APFC & IPFC Controllers	Lecture + Demonstration	Describe advanced energy-saving equipment
17	II	Energy-Efficient Transformers, Amorphous & Dry-Type Transformers	Lecture	Explain modern transformer technologies
18	II	Revision & Unit Test-II	Tutorial + Test	Assess Unit-II learning
19	III	AT&C Losses and Power Systems	Lecture	Explain technical and commercial losses
20	III	Technical Losses: I^2R Loss Reduction	Lecture + Numerical	Calculate and reduce line losses
21	III	Optimizing Distribution Voltage & Balancing Phase Currents	Lecture	Explain voltage optimization techniques
22	III	Reactive Power Compensation	Lecture + Numerical	Explain reactive power compensation
23	III	Commercial Losses: Causes & Remedies	Lecture	Identify methods to reduce commercial losses
24	III	Maximum Demand Controller, kVAR Controller & APFC	Lecture	Explain demand management equipment
25	III	Energy Conservation in Lighting Systems	Lecture	Describe efficient lighting practices
26	III	Energy Conservation in Fans & Electronic Regulators	Lecture	Explain efficient fan operation
27	III	Revision & Unit Test-III	Tutorial + Test	Assess Unit-III learning
28	IV	Cogeneration: Concept & Significance	Lecture	Explain cogeneration systems
29	IV	Topping Cycle & Bottoming Cycle Cogeneration	Lecture	Compare cogeneration cycles
30	IV	Steam Turbine Cogeneration	Lecture	Explain steam turbine cogeneration
31	IV	Gas Turbine & Reciprocating Engine Cogeneration	Lecture	Describe different cogeneration technologies

Class No.	Unit	Topic / Sub-topic	Teaching Method	Learning Outcome
32	IV	Selection Factors & Advantages of Cogeneration	Lecture	Select appropriate cogeneration systems
33	IV	Electricity Tariff Structures	Lecture	Explain different tariff types
34	IV	Time-of-Day, Maximum Demand & Power Factor Tariffs	Lecture + Numerical	Calculate electricity bills
35	IV	Tariff Applications for Energy Cost Reduction	Case Study	Apply tariff analysis for cost savings
36	IV	Revision & Unit Test-IV	Test	Assess Unit-IV learning
37	V	Energy Audit: Definition & Types	Lecture	Explain energy audit concepts
38	V	Energy Audit Instruments & Their Applications	Demonstration	Identify audit instruments
39	V	Questionnaire & Data Collection for Energy Audit	Lecture	Prepare audit checklists
40	V	Sankey Diagram & Energy Flow Analysis	Lecture + Practical	Draw and interpret Sankey diagrams
41	V	Simple Payback Period & Energy Audit Procedure	Numerical	Calculate payback period
42	V	Walk-Through Audit, Detailed Audit & Audit Report Format	Lecture	Prepare energy audit reports
43	All Units	Case Studies on Industrial Energy Conservation	Discussion	Analyze real-life energy conservation practices
44	All Units	Overall Revision & Model Test	Written Test	Evaluate complete syllabus
45	All Units	Model Test Discussion & Doubt Clearing	Interactive Session	Strengthen concepts for examinations

Sign of Faculty

Sign of HOD
R.K.Institute of Engg.&Tech
Kantapada,Niali,Cuttack

Sign of Principal
R.K INSTITUTE OF ENGG & TECH
KANTAPADA,NIALI,CUTTACK