

GOPAL KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY JEYPORE

GOURAHARI VIHAR, RANIPUT, JEYPORE KORAPUT

Discipline: ELECTRICAL ENGINEERING

Semester: 5TH

Name of the Teaching Faculty: HRUDAYA KUMAR PANIGRAHI

Subject: ELECTRICAL ENERGY CONSERVATION & AUDITING

No. of Classes per Week: 03

Semester From: February To: April

No. of Weeks: 15

Week	Class Day	Theory / Practical Topics
1st	1st	Introduction to Energy Conservation and Energy Scenario in India
	2nd	Importance of Energy Management and Energy Auditing
	3rd	Energy Consumption Patterns and Energy Conservation Act 2001
2nd	1st	Types of Energy Audits – Preliminary and Detailed
	2nd	Audit Methodology and Phases of Energy Audit
	3rd	Instrumentation for Energy Audit and Applications
3rd	1st	Preparation of Energy Audit Reports
	2nd	Energy Management Principles and Efficiency Improvement
	3rd	Energy Planning, Monitoring and Targeting
4th	1st	Cost Benefit Analysis and Life Cycle Costing
	2nd	Energy Performance Index and Benchmarking
	3rd	Electrical Load Management Techniques
5th	1st	Demand Side Management and Tariff Management
	2nd	Power Factor Improvement and Capacitor Sizing
	3rd	Load Shifting and Peak Demand Control
6th	1st	Lighting Systems: Efficacy and Control
	2nd	Energy Efficient Lamps: LED, CFL and HPSV
	3rd	Design of Lighting Schemes and Lux Level Standards
7th	1st	Electric Motors: Efficiency and Load Matching
	2nd	Motor Losses and Efficiency Classes
	3rd	Variable Speed Drives and Motor Maintenance
8th	1st	HVAC Systems and Control Strategies
	2nd	Boilers, Furnaces and Waste Heat Recovery
	3rd	Energy Saving in Fans, Blowers and Pumps
9th	1st	Compressed Air and Refrigeration Systems
	2nd	Power Quality Issues and their Impact
	3rd	Harmonics, Voltage Flicker and Mitigation Techniques
10th	1st	Industrial Energy Audit Case Study
	2nd	Cogeneration and CHP Systems
	3rd	Renewable Energy Technologies Overview
11th	1st	Solar, Wind and Biomass Energy Integration
	2nd	Microgrid and Smart Grid Concepts
	3rd	Tutorial on Lighting and Motor Audit Problems
12th	1st	Group Quiz and Mock Test Discussion
	2nd	Industrial Case Study and Audit Checklist Preparation
	3rd	DSM and Load Management Tutorials
13th	1st	Viva Preparation and Efficiency Calculation Problems
	2nd	Project Guidance on Local Energy Audit
	3rd	Renewable Energy Integration Estimation
14th	1st	Practical Energy Conservation in Campus
	2nd	Model Paper Solving and Error Analysis

	3rd	Policy Review and Energy Rules Discussion
15th	1st	Final Class Test
	2nd	Feedback, CO Mapping and Improvement Suggestions
	3rd	End Semester Exam Tips and Course Closure

Learning Resources:

Textbooks:

1. Guide Books for National Certification Examination for Energy Managers and Energy Auditors, Bureau of Energy Efficiency (BEE), Govt. of India.
2. Amit K. Tyagi, *Handbook on Energy Audits and Management*, TERI.
3. Pradeep Chaturvedi, *Energy Management: Technologies for Energy Efficiency and Sustainability*, TERI Press.
4. S. C. Tripathy, *Electric Energy Utilization and Conservation*, McGraw Hill.
5. W. R. Murphy and G. McKay, *Energy Management*, Butterworth-Heinemann.