

<b>ELO-412</b>	<b>Electrical Energy Conservation and Auditing</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	Total Contact Hours -45	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
	Applicable to which branch – EE				
	Prerequisite – Power Electronics. Power systems				
<b>Marks</b>					
Internal -40			External-60		
<b>Course Objective</b>					
<ul style="list-style-type: none"><li>● To understand the significance of energy management.</li><li>● To study the concept of energy conservation.</li><li>● To study various methods of energy audit.</li></ul>					
<b>Course Outcomes</b>					
CO1	Identify the demand supply gap of energy in Indian scenario				
CO2	Design the energy flow diagram of an industry and identify the energy wasted or a waste stream				
CO3	Implement appropriate energy conservation method to reduce the wastage of energy				
CO4	Evaluate the techno economic feasibility of the energy conservation technique				
CO5	Understand concept of energy audit of an industry/Organization.				

## **UNIT 1:**

### **Energy Scenario**

Commercial and Non-commercial energy, primary energy resources, commercial energy production, final energy consumption, energy needs of growing economy, long term energy scenario, energy pricing, energy sector reforms, energy and environment, energy security, energy conservation and its importance, restructuring of the energy supply sector, energy strategy for the future, air pollution, climate change. Energy Conservation Act-2001 and its features.

## **UNIT 2**

### **Basics of Energy Conservation**

Energy Conservation: Basic Principles, Energy conservation planning, Energy efficiency analysis of system, Energy conservation through controls, Predictive and preventive maintenance, Electric energy conservation in generation, transmission and distribution, Electric Energy conservation in building heating and lighting, Energy conservation in domestic gadgets and transport. Energy efficient motors, Electricity tariff, load management

and maximum demand control, power factor improvement, selection & location of capacitors.

### UNIT-3 Energy Management & Audit

Definition, Energy Audit: Energy Audit concepts, aims, Energy flow diagram, Strategy of Energy audit, elements, Measurements, Energy economic analysis, Evaluation of energy conserving opportunities, Energy Audit Reporting Format, BIS Specifications, Energy Audit of Building Systems. Material and Energy balance: Facility as an energy system, methods for preparing process flow, material and energy balance diagrams.

#### Text/Reference Books

- ❑ Guide books for National Certification Examination for Energy Manager / Energy Auditors Book-1, General Aspects (availableonline)
- ❑ Guide books for National Certification Examination for Energy Manager /Energy Auditors Book-3, Electrical Utilities (availableonline)
- ❑ S. C. Tripathy, “Utilization of Electrical Energy and Conservation”, McGraw Hill, 1991.
- ❑ Success stories of Energy Conservation by BEE, New Delhi([www.bee-india.org](http://www.bee-india.org))

Course to Program Outcome Relationship														
Course		CO/ PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO12
Electrical Energy Conserva tion and Auditing	ELO-412	CO1	3	2	1	1	2	0	0	0	0	0	0	0
		CO2	2	2	1	2	2	0	0	0	0	0	0	0
		CO3	2	3	2	1	2	0	0	0	0	0	0	0
		CO4	2	2	2	1	2	0	0	0	0	0	0	0
		CO5	3	2	2	1	2	0	0	0	0	0	0	0