COURSE CODE: **1152EE133**	COURSE TITLE: **ENERGY AUDITING AND MANAGEMENT**	L	T	P	C
		3	**0**	**0**	**3**

COURSE CATEGORY:

Program Elective

COURSE EDUCATIONAL OBJECTIVES:

The objectives of the course are to make the students,

- To make the student understand about the energy scenario and its importance.

COURSE OUTCOMES :

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
C01	Analyze about energy scenario nationwide and worldwide	K3
C02	Decide about energy management in more effective way.	K2
C03	Analyze about various energy related aspect of electrical system.	K3
C04	Carry out financial management.	K2
C05	Conduct studies related to operational aspects of compressed air system and refrigeration system.	K2

CORRELATION OF COs AND POs

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1											L	
CO2		H	H			M			M			
CO3	L	H			M			H			M	
CO4				H		L	H			H		
CO5		L			L			M				

COURSE CONTENT:

UNIT I	**ENERGY SCENARIO**	**9**

Energy scenario of growing economy, Energy pricing, Energy sector reforms, Energy and environment, Energy security, Energy conservation and its importance, Energy conservation Act-2001 and its features

UNIT II	**ENERGY MANAGEMENT AND AUDIT**	**9**

Energy audit- need, Types of energy audit, Energy management (audit) approach-understanding energy costs, Bench marking, Energy performance, Matching energy use to requirement, Maximizing system efficiencies, Optimizing the input energy requirements, Fuel and energy substitution, Energy audit instruments

Material and Energy Balance: Methods for preparing process flow, Material and energy balance diagrams.

UNIT III	**FINANCIAL MANAGEMENT**	**9**
Investment-need, Appraisal and criteria, Financial analysis techniques- Risk and sensitivity analysis, Financing options, Energy performance contracts and role of ESCOs.		
UNIT IV	**ELECTRICAL SYSTEM**	**9**
Electricity tariff, Load management and maximum demand control, T&D losses. Losses and efficiency in induction motors, Factors affecting motor performance and remedial solutions, energy efficient motors. Light source, Choice of lighting, Luminance requirements, and Energy conservation avenues		
UNIT V	**COMPRESSED AIR SYSTEM**	**9**
Types of air compressors, Compressor efficiency, Efficient compressor operation, Compressed air system components, Capacity assessment. HVAC and Refrigeration System: Vapour compression refrigeration cycle, Coefficient of performance, Capacity, performance and savings opportunities, Vapour absorption refrigeration system: Working principle, Saving potential, Fans, Blowers and pumps- Types, Performance evaluation, Flow control strategies and energy conservation opportunities.		
TOTAL: 45 PERIODS		

TEXT BOOKS:

1. Abbi, Y.P. and Jain, S., Handbook on Energy Audit and Environment Management, Teri Bookstore (2006).
2. Diwan, P., Energy Conservation, Pentagon Press (2008).

REFERENCE BOOKS:

1. Younger, W., Handbook of Energy Audits, CRC Press (2008).