ENERGY CONSERVATION AND AUDIT
(Elective-II)

Course Code: 13ME2316 **L P C**
4 0 3

Course Outcomes:

At the end of the course, the student will be able to

CO1. Explain the principles of energy conservation and methodology of energy auditing.

CO2. Determine energy efficiency in thermal utilities such as boilers, compressors, refrigeration systemsand cooling towers

CO3. Discuss concepts of total energy and its application and role of instrumentation in energy conservation

CO4. Propose potential areas for electrical energy conservation

CO5. Distinguish the importance of energy management, energy economics and life cycle costing.

UNIT-I

Introduction – Energy scenario, principles, and imperatives of energy conservation, energy consumption pattern, resource availability, role of energy managers in industries.

Energy auditing, methodology with respect to process industries, characteristic method employed in energy intensive industries.

UNIT-II

Energy efficiency in thermal utilities –boilers, steam systems, furnaces, insulation, refractory, cogeneration, waste heat recovery.

Energy efficiency in compressed air system, refrigeration systems, fans, blowers, pumps and pumping system, cooling towers.

UNIT-III

Concept of total energy, advantages and limitations, total energy system and application, various possible schemes.

Role of instrumentation in energy conservation, prime movers used in total energy systems, potential and economics of total energy systems.

UNIT-IV

Potential areas for electrical conservation in various industries, energy management opportunities in electrical heating, lighting system and electric motors and variable speed drives.

UNIT-V

Importance of energy management, energy economics, discount rate, internal rate of return and life cycle costing.

TEXT BOOKS:

1. Goswami and Kreith, "*Energy Conversion"*, CRC Press, 2007.

2. Umesh Rathod, "Energy management", S.K. Kataria & Sons,

REFERENCES:

1. Y.P. Abbi, "Energy audit, thermal power, combined cycle and cogeneration plants", Teri Publishers, 2012.

2. W.C. Turner., "*Energy management hand book"*, CRC Press Publications.