EEE20	**ENERGY CONSERVATION AND MANAGEMENT**	**3**	**0**	**0**	**3**

Prerequisite Nil

Course Objectives

1. To understand the concepts of energy conservation.
2. To learn the components in electrical system
3. To Explain the thermal components used in electrical system.
4. To know the energy conservation in major utilities.
5. To analyze the economics of energy conservation.

Course Outcomes

On successful completion of the course, the student will be able to:

1. Evaluate the concepts of energy conservation.(1,2)
2. Explain the components in electrical system.(4)
3. Explain the thermal components used in electrical system.(4)
4. Demonstrate the energy conservation in major utilities.(4)
5. Analyze the economics of energy conservation.(6,7)

Note: Numbers given in the parenthesis refer to Graduate Attributes required by (NBA).

UNIT I INTRODUCTION **9**

Energy – Power – Past & Present scenario of World; National Energy consumption Data – Environmental aspects associated with energy utilization –Energy Auditing: Need, Types, Methodology and Barriers. Role of Energy Managers. Instruments for energy auditing.

UNIT II ELECTRICAL SYSTEMS **9**

Components of EB billing – HT and LT supply, Transformers, Cable Sizing, Concept of Capacitors, Power Factor Improvement, Harmonics, Electric Motors – Motor Efficiency Computation, Energy Efficient Motors, Illumination – Lux, Lumens, Types of lighting, Efficacy, LED Lighting and scope of Encon in Illumination.

UNIT III THERMAL SYSTEMS **9**

Stoichiometry, Boilers, Furnaces and Thermic Fluid Heaters – Efficiency computation and encon measures. Steam: Distribution &U sage: Steam Traps, Condensate Recovery, Flash Steam Utilization, Insulators & Refractories

UNIT IV ENERGY CONSERVATION IN MAJOR UTILITIES **9**

Pumps, Fans, Blowers, Compressed Air Systems, Refrigeration and Air Conditioning Systems – Cooling Towers – D.G. sets

UNIT V ECONOMICS **9**

Energy Economics – Discount Rate, Payback Period, Internal Rate of Return, Net Present Value, Life Cycle Costing –ESCO concept.

Text Books

1. Energy Manager Training Manual (4 Volumes) available at www.energymanager training.com, a website administered by Bureau of Energy Efficiency (BEE), a statutory body under Ministry of Power, Government of India, 2004.

References

1. Witte. L.C., P.S. Schmidt, D.R. Brown, “Industrial Energy Management and Utilisation” Hemisphere Publ, Washington, 1988.
2. Callaghn, P.W. “Design and Management for Energy Conservation”, Pergamon Press, Oxford, 1981.
3. Dryden. I.G.C., “The Efficient Use of Energy” Butterworths, London, 1982
4. Turner. W.C., “Energy Management Hand book”, Wiley, New York, 1982.
5. Murphy. W.R. and G. Mc KAY, “Energy Management”, Butterworths, London 1987.