

<b>COURSE CODE:</b> <b>1154EE110</b>	<b>COURSE TITLE: ENERGY CONSERVATION AND MANAGEMENT</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>							
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>							
<b>COURSE CATEGORY:</b>												
University Elective												
<b>PREAMBLE :</b>												
This course gives a brief introduction about electrical energy conservation and mitigation												
<b>PREREQUISITE COURSES:</b>												
Basic Electrical Engineering												
<b>RELATED COURSES:</b>												
Utilization of electrical Energy, Power plant engineering												
<b>COURSE EDUCATIONAL OBJECTIVES:</b>												
The objectives of the course are to make the students,												
<ul style="list-style-type: none"> <li>• To understand the basics about energy engineering and management</li> <li>• To get knowledge about EB and efficient way to use electrical energy</li> <li>• Basics about thermal engineering and equipment related to thermal engineering</li> <li>• Quantity of electrical energy utilized by different components</li> </ul>												
<b>COURSE OUTCOMES :</b>												
Upon the successful completion of the course, students will be able to:												
<b>CO Nos.</b>	<b>Course Outcomes</b>				<b>Knowledge Level (Based on revised Bloom's Taxonomy)</b>							
CO1	Introduction about energy consumption, energy management, energy auditing.				K2							
CO2	Energy consumption and capacity of different electrical equipment's				K2							
CO3	Thermal stability and analysis of electrical equipment's				K2							
CO4	Energy conservation in major electrical devices				K2							
CO5	Economical oriented energy management systems				K2							
<b>CORRELATION OF COs AND POs</b>												
<b>Cos</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
CO1			M					L	M			L
CO2	L		M	M				L	M			
CO3			M	L				L	M			
CO4				L				L			M	
CO5	M			H				L	M			

<b>COURSE CONTENT:</b>		
<b>UNIT I</b>	<b>INTRODUCTION</b>	<b>9</b>
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.		
<b>UNIT II</b>	<b>ELECTRICAL SYSTEMS</b>	<b>9</b>
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		
<b>UNIT III</b>	<b>THERMAL SYSTEMS</b>	<b>9</b>
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		
<b>UNIT IV</b>	<b>ENERGY CONSERVATION IN MAJOR UTILITIES</b>	<b>9</b>
Pumps, Fans, Blowers, Compressed Air Systems, Refrigeration and Air Conditioning Systems – Cooling Towers – D.G.		
<b>UNIT V</b>	<b>ECONOMICS</b>	<b>9</b>
Energy Economics – Discount Rate, Payback Period, Internal Rate of Return, Net Present Value, Life Cycle Costing –ESCO concept		
<b>TOTAL: 45 PERIODS</b>		
<b>TEXT BOOKS:</b>		
1. Energy Manager Training Manual (4 Volumes) available at <a href="http://www.energymanagertraining.com">www.energymanagertraining.com</a> , a website administered by Bureau of Energy Efficiency (BEE), a statutory body under Ministry of Power, Government of India, 2004.		
<b>REFERENCE BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. Witte. L.C., P.S. Schmidt, D.R. Brown, "Industrial Energy Management and Utilisation" Hemisphere Publ, Washington, 1988.</li> <li>2. Callaghn, P.W. "Design and Management for Energy Conservation", Pergamon Press, Oxford, 1981.</li> <li>3. Dryden. I.G.C., "The Efficient Use of Energy" Butterworths, London, 1982</li> <li>4. Turner. W.C., "Energy Management Hand book", Wiley, New York, 1982.</li> <li>5. Murphy. W.R. and G. Mc KAY, "Energy Management", Butterworths, London 1987.</li> </ol>		