

Course Code	18ECO306T	Course Name	ENERGY CONSERVATION			Course Category	O	Open Elective										L	T	P	C																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Pre-requisite Courses		Nil	Co-requisite Courses		Nil	Progressive Courses		Nil	Program Learning Outcomes (PLO)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Course Offering Department		Electrical and Electronics Engineering			Data Book / Codes/Standards			Nil																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Course Learning Rationale (CLR):		The purpose of learning this course is to:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
CLR-1 :		Outline the concepts of world energy scenario in industries																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
CLR-2 :		Describe the basics of electrical system																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
CLR-3 :		Impart knowledge on various methods of improving energy efficiency in industries																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
CLR-4 :		Give an overview about the energy policies, energy planning and policy making in India																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
CLR-5 :		Provide an understanding of the basics of energy conservation method and energy auditing in industries																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
CLR-6 :		Create overall structure of energy conservation starting from environmental aspects to energy management systems																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Course Learning Outcomes (CLO):		At the end of this course, learners will be able to:					Learning																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
CLO-1 :		Gain Knowledge of world energy scenario					1		2		3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
CLO-2 :		Understand the concepts of electrical system					2		75		75		Expected Proficiency (%)		Expected Attainment (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
CLO-3 :		Assess the energy efficiency in industrial system					3		75		75		H		Problem Analysis		Design & Development		Analysis, Design, Research		Modern Tool Usage		Society & Culture		Environment & Sustainability		Ethics		Individual & Team Work		Communication		Project Mgt. & Finance		Life Long Learning		PSO - 1		PSO - 2		PSO - 3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
CLO-4 :		Analyse the energy policies, energy planning and policy making in india					3		75		75		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H		H	

SLO-2	Environmental aspects associated with energy conservation	Harmonics	Efficient system operation	key developments and changes in India's energy policies and planning in the context of energy efficiency and environmental concerns	Targeting: Defining monitoring & targeting
S-7	SLO-1	Electric Motors – Motor Efficiency Computation	Efficient system operation	regulatory frameworks and reforms across various energy sectors	elements of monitoring & targeting
	SLO-2	Methodology and Barriers	Validation of energy saving using application software	regulatory frameworks and reforms across various energy sectors	Data and information-analysis, techniques
S-8	SLO-1	Role of Energy Managers	Illumination – Lux, Lumens	Energy Policies success stories, failures	Energy consumption
	SLO-2	Needs of Energy Managers	Types of lighting, Efficacy	Energy saving potential of technology	Production, cumulative sum of differences (CUSUM).
S-9	SLO-1	Instruments for energy auditing	LED Lighting And types	Energy tariffs and Energy Instrument	Energy Management Information Systems (EMIS)
	SLO-2	Energy conservation	Scope Of Encon In Illumination	CASE STUDY for energy tariffs in industry	Energy Management Information Systems (EMIS)

Learning Resources	<p>1. Witte, L.C., P.S. Schmidt, D.R. Brown, Industrial Energy Management and Utilisation, Hemisphere Publ, Washington, 1988</p> <p>2. Callaghi, P.W. Design and Management for Energy Conservation, Pergamon Press, Oxford, 1981</p> <p>3. Energy Manager Training Manual (4 Volumes) available at www.energymanagertraining.com, a website administered by Bureau of Energy Efficiency (BEE), a statutory body under Ministry of Power, Government of India, 2004</p>	<p>4. R Loulou, P R Shukla and A Kanudia Energy and Environment Policies for a sustainable Future, Allied Publishers Ltd, New Delhi, 1997</p> <p>5. Handbook on Energy Efficiency, TERI, New Delhi, 2001</p> <p>6. https://www.edx.org/course/incorporating-renewable-energy-in-electricity-grids-2</p>
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Learning Assessment		Continuous Learning Assessment (50% weightage)						Final Examination (50% weightage)	
Level	Bloom's Level of Thinking	CLA – 1 (10%)		CLA – 2 (15%)		CLA – 3 (15%)		CLA – 4 (10%)#	
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	40 %	-	30 %	-	30 %	-	30 %	-
Level 2	Understand	40 %	-	40 %	-	40 %	-	40 %	-
Level 3	Apply	20 %	-	30 %	-	30 %	-	30 %	-
	Analyze								
	Evaluate								
	Create								
	Total	100 %		100 %		100 %		100 %	

CLA – 4 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.

Course Designers				Internal Experts
Experts from Industry				
1. Dr. P. Dharmalingam, Executive Director, EnsaverPvt Ltd, pdlingam@gmail.com				1. Mr. M. Sadees, SRMIST
2. Mr. N. Saravanan, Engineering Manager Electrical, L&T Ltd, n-saravanan@lntec.com				2. Dr. D. Sattianadan, SRMIST