KSSEM

CO-PO Mapping

Course: ENERGY & ENVIRONMENT			
Type: Core		**Course Code: 18ME751**	
No of Hours			
Theory (Lecture Class)	Practical/Field Work/Allied Activities	Total hours/Week	Total teaching hours
3	0	3	40
Marks			
Internal Assessment	Examination	Total	Credits
40	60	100	3

Aim/Objective of the Course:

The objective of this course is to:

1. Understand energy scenario, energy sources and their utilization
2. Learn about methods of energy storage, energy management and economic analysis
3. Impart awareness about environment and eco system.
4. Understand the modes & impact of environmental pollution along with social issues and acts.

Course Learning Outcomes
After completing the course, the students will be able to

CO1	Understand the basic concepts of energy, sources of energy, its distribution, world energy production & distribution and key energy trends in India.	Understanding (K2)
CO2	Understand the role of environment, eco system and need for environmental awareness.	Understanding (K2)
CO3	Interpret the various types of environment pollution and their effects on human beings	Understanding (K2)
CO4	Discuss the social issues of the environment with associated acts.	Understanding (K2)
CO5	Interpret different energy storage systems, energy management, perform energy audit and economic analysis	Applying (K3)

Syllabus Content

Module 1 Energy and power, forms of energy, primary energy sources, energy flows, world energy production and consumption, Key energy trends in India: Demand, Electricity, Access to modern energy, Energy production and trade, Factors affecting India's energy development: Economy and demographics Policy and institutional framework, Energy prices and affordability, Social and environmental aspects, Investment.	**CO1** **8 hrs** PO1-3 PO7-3 PO12-2

LO: At the end of this session the student will be able to, 1. Explain the concept of energy 2. Understand sources of energy, its distribution, world energy production and key energy trends in India.	PSO1-2 PSO2-1
Module 3: **Environment:** Introduction, Multidisciplinary nature of environmental studies- Definition, scope and importance, Need for public awareness. **Ecosystem:** Concept, Energy flow, Structure and function of an ecosystem. Food chains, food webs and ecological pyramids, Forest ecosystem, Grassland ecosystem, Desert ecosystem and Aquatic ecosystems, Ecological succession. LO: At the end of this session the student will be able to, 1.Understand the importance of environment 2.Explain Different types of Ecosystems	**CO2** **8 hrs** PO1-3 PO7-3 PO8-2 PO12-2 PSO1-2 PSO2-1
Module 4: **Environmental Pollution:** Definition, Cause, effects and control measures of - Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution and Nuclear hazards , Solid waste Management, Disaster management Role of an individual in prevention of Pollution, Pollution case studies. LO: At the end of this session the student will be able to, 1. Understand causes, effects and control measures of pollutions. 2. Demonstrate solid waste management	**CO3** **8 hrs** PO1-3 PO7-3 PO9-2 PO12-2 PSO1-2 PSO2-1
Module 5: **Social Issues and the Environment:** Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. Wasteland reclamation, Consumerism and waste products, Environment Protection Act, Air (Prevention and Control of Pollution LO: At the end of this session the student will be able to, 1. Understand Social Issues and the Environment Climate change, global warming, acid rain, ozone layer depletion 2.Demonstrate Environment Protection Act, Air (Prevention and Control of Pollution)	**CO4** **8 hrs** PO1-3 PO7-3 PO12-2 PSO1-2 PSO2-1
Module 2: **Energy storage systems:** Thermal energy storage methods, Energy saving, Thermal energy storage systems **Energy Management:** Principles of Energy Management, Energy demand estimation, Energy pricing **Energy Audit:** Purpose, Methodology with respect to process Industries, Characteristic method employed in Certain Energy Intensive Industries **Economic Analysis:** Scope, Characterization of an Investment Project LO: At the end of this session the student will be able to, 1. Understand functions of Energy storage system & Energy management. 2. Perform the energy Audit & Economic analysis	**CO5** **8 hrs** PO1-3 PO2-2 PO7-3 PO12-2 PSO1-2 PSO2-1

Text Books

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	Textbook for Environmental Studies for Undergraduate Courses of all Branches of Higher Education		University grant commission and Bharathi Vidyapeeth Institute of environment education and Research,Pune	
2	Energy Management Audit &	Barun Kumar De	Vrinda Publication	2nd Edition 2010

REFERENCE BOOKS:

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	Energy Management Hand book,	Turner, W. C., Doty, S. and Truner, W. C	Fairmont Press,	7th edition 2009.
2	Energy Management,	Murphy, W. R	Elsevier,	2007.
3	Energy Management Principles	Smith, C. B	Pergamum	2007
4	Environment pollution control Engineering	C S Rao	New Age International	reprint 2015, 2nd edition
5	Environmental studies	Benny Joseph	Tata McGraw Hill	2nd edition 2008

Useful Websites :

https://www.scimagojr.com › journalsearch
https://onlinelibrary.wiley.com › journal

Useful Journals :

- International Journal of Energy and Environment (IJEE)
- International Journal of Energy and Environmental Engineering (IJEEE)

Teaching and Learning Methods

1. Lecture class: 40 hours
2. Practical classes: 0 hours

Assessment

Type of test/examination: Written examination

Continuous Internal Evaluation(CIE) : 40 marks (30 marks -Average of three tests + 10 marks Assignments)

Semester End Exam (SEE): 100 marks (students have to answer all main questions) which will be reduced to 60 Marks.

Test duration: 1 :30 hours

Examination duration: 3 hours

CO to PO Mapping

PO1: Science and engineering Knowledge **PO2:** Problem Analysis **PO3:** Design & Development **PO4:**Investigations of Complex Problems **PO5:** Modern Tool Usage **PO6:** Engineer & Society	**PO7:**Environment and Society **PO8:**Ethics **PO9:**Individual& Team Work **PO10:** Communication **PO11:**ProjectMngmt& Finance **PO12:**Lifelong Learning

PSO1: Ability to apply concept of mechanical engineering to design a system, a component or a process/system to address a real-world challenge

PSO2: Ability to develop effective communication, team work, entrepreneurial and computational skills

O	PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
8ME 751	K-level														
CO1	K2	3	-	-	-	-	-	3	-	-	-	-	2	3	1
CO2	K2	3	-	-	-	-	-	3	-	-	-	-	2	3	1
CO3	K2	3	-	-	-	-	-	3	-	2	-	-	2	3	1
CO4	K2	3	-	-	-	-	-	3	2	2	-	-	2	3	1
CO5	K3	3	2	0	0	0	0	3	2	-	-	-	2	3	1

Course In charge 19/9/23

Head of the Department

Principal