



Course Title: Concepts of Energy, Ecology and Environment

Course Code: SAE606

Credit Units: 3

L	T	P	SW/ FW	TOTAL CREDIT UNITS
3	-	-	-	3

Course Objectives: To enhance the understanding of conventional and non-conventional energy sources and its relationship with the ecology and environment.

Pre-requisites: Basic Science

Course Contents/Syllabus:

	Weightage (%)
Module I Basics of Energy	20
<ul style="list-style-type: none">• Energy and Power• Different types of Energy• India's energy scenario• World energy scenario• Conventional energy resources: fossil fuel, coal, petroleum, natural gas, nuclear power	
Module II Alternative Energy Sources	15
<ul style="list-style-type: none">• Alternative Fuels: Ethanol, Methanol, Biodiesel, CNG, LPG• Renewable energy: solar, hydro, wind, biomass, ocean, tidal, wave and geothermal• Hydrogen as an alternative future source of Energy.• Global environment issues: greenhouse gas emission, global warming, green energy solutions.	
Module III Ecosystem	20
<ul style="list-style-type: none">• Definition, concepts, structure• Realm of ecology• Energy balance to earth	

<ul style="list-style-type: none"> • Matter and nutrient recycling in ecosystems • Worldviews and environmentally sustainable economic growth 	
Module IV Environmental Pollution and their effects	25
<ul style="list-style-type: none"> • Environmental Pollution and their effects • Air pollution - primary, secondary, chemical and photochemical reactions • Effects of CO, NO, CH and particulates • NO - NO₂ – O₃ Photochemical Reaction Sequence • Acid rain • Ozone depletion • Water pollution: RO, Ultrafiltration • Biological oxygen Demand • Analysis and management, heavy metals- and nuclear pollutions; industrial pollution from paper, pharmacy, distillery, tannery, fertilizer, food processing and small scale industries 	
Module V Environmental Protection and Ethics	20
<ul style="list-style-type: none"> • Environmental Protection- Role of Government • Initiatives by Non-governmental Organizations (NGO) • Environmental Education. Ethics and moral values • Objectives of ethics, Professional and Non-professional ethics • Sustainable Development of the ecology and environment • Codes of ethics and their limitations 	

Student Learning Outcomes:

- To demonstrate knowledge of new and renewable energy and their relationship with ecology & environment.
- To describe conventional and non-conventional energy scenario with respect to environment.
- To analyze Synergy between energy and environment, global environment issues.
- To explain the Environmental Pollution and their effects on environment
- To apply awareness regarding environmental protection and application of renewable energy.

Pedagogy for Course Delivery:

The class will be taught using theory and case based method. In addition to assigning the case studies, the course instructor will spend considerable time in understanding the concept of innovation through the eyes of the consumer. The instructor will cover the ways to think innovatively liberally using thinking techniques

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)
100	NA

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	Class Test	Assignment	Viva	Attendance	
Weightage (%)	15	5	5	5	70

Text & References:

1. Gilbert M. Masters and Wendell P. ELA – Introduction to Environmental Engineering And Science
2. W. Cunningham – Principles of Environmental Science, TMH
3. P. Venugoplan Rao – Principles of Environmental Science and Engineering, PHI.
4. Meenakshi – Environmental Science and Engineering, Prentice Hall India.
5. Martin – Ethics in Engineering, TMH