

Year (Semester)	Course Title	Course Code	L-T-P-Credits
3rd Year (5 th Semester)	Energy Conversion Technologies	EET B1 901	3-0-0-3
Evaluation Policy	Mid-Term	Internal Assessment	End-Term
	26 Marks	24 Marks	50 Marks

Pre-requisites: None.

Course Outcomes: At the end of the course, the student will be able to:

CO No.	Course Outcome	Bloom's Taxonomy Level
CO1	Identify and classify various non-conventional energy resources and describe their significance in modern energy systems.	3
CO2	Understand the working and components of solar thermal systems. Analyse solar photovoltaic (PV) systems, their characteristics, MPPT and applications.	4
CO3	Understand wind energy systems, turbine types, performance characteristics.	5
CO4	Understand the role and components of other alternate sources. Evaluate energy storage methods and their importance in renewable energy applications.	4

Detailed Syllabus:

Module No.	Contents	Hours
Module 1	Classification of Energy Resources, Importance of Alternate Source of Energy, Present Status and Growth of Energy Sector, Various Aspects of Energy Conservation.	06
Module 2	Solar Energy Basics: Sun, Earth Radiation Spectrums, Measurements of Solar Radiation, Solar Radiation Data, Solar Geometry. Solar Thermal Systems: Classification. Solar Water Heater, Solar Refrigeration and air-conditioning systems, Solar Cookers, Solar Pond Electric power plant. Solar Photovoltaic (PV) systems: Construction and Working of Solar Cell, Characteristics, Equivalent Circuit, MPPT.	12
Module 3	Wind Energy: Origin of winds, nature of winds, wind turbine siting, major applications, estimation of wind energy, wind speed characteristics, Wind Turbines and their classification, Wind Generators, Wind Energy Conversion Systems.	9
Module 4	Other alternate sources of energy (Small Hydro resources, biomass, ocean energy, geothermal energy): Introduction, Classification, Essential Components and Principles.	8
Module 5	Emerging Technologies: Fuel Cell and Hydrogen Energy, Super-Capacitors, Superconducting Magnetic Energy Storage (SMES), Applications.	7

Books Recommended:

1. B.H. Khan, Non-Conventional Energy Sources, McGraw Hill
2. J. Twidell and T. Weir, Renewable Energy Resources, Taylor and Francis Group
3. G.N. Tiwari, M.K. Ghosal, Renewable Energy Resources: Basic Principles and Application, Narosa Publishing House
4. R.K. Singal, Non-Conventional Energy Resources, Dhanpat Rai
5. S. Rao, B.B. Pariekar, Energy Technology, Khanna Publications