(EE515) ENERGY CONVERSION SYSTEMS

(ELECTIVE - II)

Objective of the course:

The student learns the prevailing nonconventional energy systems and the ways of harnessing them. The development of these energy systems will find an answer to meet future needs.

UNIT - I

Photo voltaic power generation ,spectral distribution of energy in solar radiation, solar cell configurations, voltage developed by solar cell, photo current and load current, practical solar cell performance, commercial photo voltaic systems

UNIT - II

Test specifications for pv systems, applications of super conducting materials in electrical equipment systems Principles of MHD power generation, ideal MHD generator performance, practical MHD generator, MHD technology Wind Energy conversion: Power from wind, properties of air and wind, types of wind Turbines,

UNIT - III

Operating characteristics Tides and tidal power stations, modes of operation, tidal project examples, turbines and generators for tidal power generation. Wave energy conversion: properties of waves and power content, vertex motion of Waves, device applications. Types of ocean thermal energy conversion systems Application of OTEC systems examples

UNIT - IV

Miscellaneous energy conversion systems: coal gasification and liquefaction, biomass conversion, geothermal energy, thermo electric energy conversion, principles of EMF generation, description of fuel cells Co-generation and energy storage, combined cycle co-generation, energy storage. Global energy position and environmental effects: energy units, global energy position

UNIT - V

Types of fuel cells, H2-O2 Fuel cells, Application of fuel cells – Batteries, Description of batteries, Battery application for large power Environmental effects of energy conversion systems, pollution from coal and preventive measures steam stations and pollution, pollution free energy systems

REFERENCE BOOKS:

1. Rakosh das Begamudre, “Energy conversion systems” New age international publishers, New Delhi - 2000.

2. John Twidell and Tony Weir, “Renewable Energy Resources” 2nd ed., Fspon & Co