

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
SYLLABUS OF B.E IV- SEMESTER
NON-CONVENTIONAL ENERGY SOURCES (Open Elective –II)

Instruction: 1Hrs /week	SEE Marks :40	Course Code :OE410EE
Credits :1	CIE Marks: 30	Duration of SEE : 2Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
To provide a survey of the most important renewable energy resources and the technologies for harnessing these resources within the framework of a broad range of simple to state-of-the-art energy systems.	After completion of the course, students will be able to: 1. Demonstrate the generation of electricity from various Non-Conventional sources of energy, have a working knowledge on types of fuel cells. 2. Estimate the solar energy, Utilization of it, Principles involved in solar energy collection and conversion of it to electricity generation. 3. Explore the concepts involved in wind energy conversion system by studying its components, types and performance. 4. Illustrate ocean energy and explain the operational methods of their utilization. 5. Acquire the knowledge on Geothermal energy.

UNIT-I:

Need for Non-conventional energy sources, Types of Non-Conventional energy sources
 Fuel cells: Definition-Design and Principle of operation with special reference to H₂O₂-Solid oxide electrolyte cells-Advantages and Disadvantages of fuel cells-Applications of Fuel cells.
 Solar Energy: Solar radiation and its measurements-Solar energy collectors: Flat Plate and Concentrating Collectors- solar pond -Applications of Solar energy.
 Biomass Energy: Definition-Biomass conversion technologies.

UNIT-II:

Wind Energy: Nature of wind-Basic components of Wind Energy Conversion System(WECS)-Wind energy collectors: Horizontal and vertical axis rotors- Advantages and Disadvantages of WECS - Applications of wind energy.
 Ocean Energy: Ocean thermal electric conversion (OTEC) methods: Open cycle and Closed cycle-Principles of tidal power generation-Advantages and limitations of tidal power generation.
 Geothermal Energy: Types of Geothermal resources- Applications of Geothermal Energy.

Suggested Reading:

1. G.D. Rai, Non-Conventional Energy Sources ,Khanna Publishers, New Delhi, 2011.
2. B H KHAN, Non-Conventional Energy Resources, McGraw Hill, 2nd Edition, 2009.
3. Ashok Desai V, Non-Conventional Energy, Wiley Eastern Ltd, 1990.
4. Mittal K.M, Non-Conventional Energy Systems, Wheeler Publishing Co. Ltd, 1997.
5. Ramesh R, Kurnar K.U, Renewable Energy Technologies, Narosa Publishing House, New Delhi, 1997.