Course Type	Course Code	Name of Course		Т	Р	Credit
DE	NCYD515	Advances in Nonconventional Energy Systems		0	0	3

Course Objective

This course will impart

- Electrochemical techniques related to conversion and storage energy.
- Fundamental understanding of the Chemical, Electrochemical and Photochemical processes in Energy generation, storage and Utilization

Learning Outcomes

After studying this course, students should be able to:

- Understand the basic electrochemical techniques used in energy conversion and storage systems.
- Advantage and disadvantages in the Industrial methods for generation of Fuels.
- Use concepts towards the mimicking systems in artificial photosynthesis.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome				
1	Electrochemical Techniques and their application to Real Systems, Electrochemical Cells: Batteries, Supercapacitors.	15L	This unit will be helpful in learning basic electrochemical techniques used in energy conversion.				
2	Fuels through industrial reforming, Fischer-Tropsch process, and Water-gas shift reactions, Multi electronic reservoirs for Electrochemical energy storage.	13L	The students will learn regarding the Advantage and disadvantages in the Industrial methods for generation of Fuels.				
3	Recent advances in Fuel Cells, Synthesis, Characterization and Application Energy Materials: Electrochemical, photochemical and chemical methods for HER and OER catalysis,	14L	This unit imparts the concepts towards the mimicking systems in artificial photosynthesis				
TOTAL		42					

Text Books:

1. Electrochemical and Electrocatalytic Reactions of Carbon Dioxide; Edited by: B.P. Sullivan, K. Krist and H.E. Guard; ISBN: 978-0-444-88316-2.

Reference Books:

- Energy Production and Storage: Inorganic Chemical Strategies for a Warming World (Inorganic Chemical Strategies for a Warming World), edited by Robert H. Crabtree ISBN: 978-0-470-74986-9, Wiley Publications.
- 2. Molecular Water Oxidation Catalysis, edited by Antoni Llobet ISBN: 978-1-118-41337-1, Wiley Publications.