Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NPED505	Carbon Capture, Utilization and Sequestration	3	0	0	3

Course Objective

- The need for carbon capture and sequestration, different methods, application in Hydrocarbon industry
- Modeling and implementation CO2 sequestration project

Learning Outcomes

- Student will learn the in-depth mechanism of possible CO_2 sequestration methods
- Different aspect of CO_2 sequestration implementation in EOR projects

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1.	Introduction: scope, objectives and necessity of CCUS.	4	Why to go for CCUS and how to do?
2	The contribution of fossil fuels emission to climate change and global warming. Concept of carbon credit and carbon footprint.	5	Student shall understand how fossil fuels are responsible for climate change and its extent depending on the types of gas emission. They also shall gain the idea about carbon credit and its benefit.
3.	Carbon capture techniques: CO_2 emission, scrubbing of CO_2, CO_2 re-cycling.	5	Students should learn about the processes emitting CO_2 and should be able to identify the suitable technology for remedy.
4.	CO_2 sequestration: underground storage,potential for geologic storage, and applications in oil and gas industry.	6	What are available options for geological carbon storage and how the technology could be used for enhancing the hydrocarbon recovery simultaneously at the time of sequestration
5.	CO_2 flooding projects and methane recovery projects.	7	Learning about the mechanism of CO_2 injection for recovery the stored methane in Coalbed and oil from conventional reservoirs
6.	Strategy for implementing CCUS technologies.	5	Understanding about the policies taken by various industries and countries.
7.	Modeling of cost and performance of CCUS plants.	5	Cash flow performance involved in CCUS plant
8.	Role and function of IPCC.	5	Understanding about policies, Acts, rules and regulations of IPCC
	Total Lecture hours	**42**	

Reference Books:

1. Introduction to Carbon Capture and Sequestration, Berend Smit, Imperial college press, 2014
2. Carbon Capture and Storage, Stephen A. Rackley, Elsevier,2017