Course Type	Course Code	Name of Course	L	T	P	Credit
DC10	PEC303	Natural Gas Engineering	3	0	0	9

Course Objective
The objective of the course is to provide the basic knowledge of natural gas and its utilization
Learning Outcomes
Upon successful completion of this course, students will have the exposure of the natural gas processing, handling and utilization.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	**Introduction:** Composition of Natural Gas, Utilization of Natural Gas, Natural Gas Industry, Natural Gas Reserves, Types of Natural Gas Resources, Future of the Natural Gas Industry.	5	This will help students to learn about formation, composition and utilization of natural gas.
2	**Properties of Natural Gas:** Physical properties of natural gas and hydrocarbon liquids associated with natural gas. Reservoir aspects of natural gas. Calorific value of gas and measurement.	6	This unit will help students to learn the different properties of natural gas.
3	**Gas Compression:** Heat and Mass Transfer Principles and Applications in Natural Gas Engineering, Use of Mollier Diagrams.	6	This unit will help student to learn the importance of compression in gas industry. This unit give detailed idea of reciprocating and centrifugal compression processes.
4	**Gas Flow Measurement:** Process control and instrumentation in natural gas processing plants.	5	This unit will help students to get the exposure of different flow measurement devices. And also its utilization in gas industry.
5	**Natural Gas Processing:** Field separation and oil absorption process, Refrigeration and low temperature processing, Liquefaction Process, Dehydration of Natural Gas, Sweetening of Natural gas and sulphur recovery. Processing for LPG, CNG, system, Conversion of gas to liquid. Custody transfer- principles and measurements.	5	This unit will help students to understand different natural gas processing processes.
6	**Gas Gathering, Transport and Storage:** Gas Gathering System. Steady Flow in Simple Pipeline System, Steady State and non Steady State Flow in Pipelines, Solution for Transient Flow. Transmission of Natural Gas, Specifications. Underground Storage and Conservation of Natural Gas. LPG, NGL & LNG storage.	5	This unit will help students to get the natural gas flow concept in pipeline. Also this unit deals with understanding the natural gas underground storage and converting the natural gas in different valuable products.
7	LNG: Production and Utilization.	5	This unit will help students to learn the production of LNG using different processes.
8	Issue and Challenges to Enhance Supply of Natural Gas	5	This unit will help student to learn the issues and challenges faced by industry while enhancing the supply of natural gas.
	Total contact hours	**42**	

Text Books:

- Gas Production Engineering : Sanjay Kumar
- Natural Gas Production Engineering : Mohan Kelkar
- Handbook of Natural Gas Engineering : Doland L. Katz

Reference Books:

- Practical Natural Gas Engineering : R. V. Smith
- Natural Gas : E. N. Tiratsoo
- Fundamentals of Gas Reservoir Engineering : Jacques Hogoort