

21PCM107T					Introduction to Petroleum and Petrochemical Engineering					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hours/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
2	0	0	2	2	25	50	25	--	--	100

COURSE OBJECTIVES

- Demonstrate the unique characteristics of various rocks
- It will help in physical understanding of the petroleum engineering problems and phenomena
- Develop skill to identify petroleum potential of an area
- To introduce the concepts that will enable the transition from science to petrochemical engineering
- Understand and significant role of petrochemical engineers in everyday life and the importance of petrochemical engineering in consideration of environmental and safety aspects in process industries
- To learn the basic knowledge of common unit operations and unit process in major petrochemical industries

UNIT I OIL & GAS EXPLORATION METHODS

7 Hrs.

Nature of Petroleum- composition & properties; Overview of Petroleum geology & basic rock properties: Source, migration and accumulation of petroleum, Seal and trap; Overview of Petro physical properties of rock and fluid; Overview of drilling operation: Rig Components, Drill String, Casing policy, Drilling fluid and Cementing.

UNIT II RESERVOIR DRIVES & OIL RECOVERY

7 Hrs.

Fundamentals of reservoir engineering; classification of reservoir flow systems; Darcy's law of fluid flow; Pressure distribution and pressure gradient for linear, radial, compressible, steady state flow; Average permeability calculations for beds in series and beds in parallel for linear and radial reservoir geometry; Brief study of fluid flow through porous media. Production system of crude oil from reservoir to storage and refining; Concept of oil production, gathering, treatment & storage and transportation.

UNIT III INTRODUCTION TO PETROCHEMICAL ENGINEERING

7 Hrs.

History and Overview of petrochemical industry, Role of Petrochemical Engineer. Major companies in India & abroad. Prospects & Future. Composition of crude oil, Physical properties of oil. Petroleum Materials – Native Materials, Manufactured Materials, Derived Materials.

UNIT IV ROLE OF PETROCHEMICAL ENGINEERS

7 Hrs.

Introduction, petrochemical engineering in everyday life, Lab scale to plant scale, Versatility of a Chemical/Petrochemical Engineer, Role of petrochemical Engineers in Petroleum refinery, Chemical, Petrochemical, Nanotechnology, Energy and environment. Introduction & Basic concepts of analysis of processes, unit operations, basic laws, units and dimensions. Batch Processing, Transition from batch to continuous processing, Case study: Any chemical industry, Role of basic sciences in petrochemical Engineering (Introduction).

Max. 28 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1: Understand petroleum system and storage in rocks

CO2: Apply the knowledge for efficient exploration and exploitation of petroleum

CO3: Analyse the behaviour of crude oil from reservoir to storage and in refinery system

CO4: Demonstrate the role of petrochemical engineers in everyday life and the importance of petrochemical engineering

CO5: Describe various unit operations and unit processes in petrochemical industries

CO6: Analyse the role of petrochemical engineers in environmental and safety aspects in process industries

TEXT/REFERENCE BOOKS

1. Telford, W M, Geldart, L.P., Sheriff, R.E. and Keys, D.E., Applied Geophysics, Oxford and IBH Publishing Co Pvt Ltd.
2. Mukherjee P.K.: A Text Book of Geology
3. B.P. Tissot and D.H. Welte: Petroleum formation and occurrence: a new approach to oil and gas exploration.
4. James G. Speight "The Chemistry and Technology of Petroleum", 4th edition, CD&W Inc. Laramie, Wyoming 2007.
5. Uttam Ray Chaudhuri "Fundamentals of Petroleum and Petrochemical Engineering", CRC Press, 2011.
6. B.K Bhaskar Rao "A textbook on Petrochemicals", 2/e, publishers-Delhi 1998.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Part A: 10 Questions each carrying 5 marks

Part B: 5 Questions each carrying 10 marks

Exam Duration: 3 Hrs.

50 Marks

50 Marks