Course code	Course Name	L-T-P-Credits	Year of Introduction
CH461	PETROLEUM REFINERY ENGINEERING	3-0-0-3	2016

Prerequisite : Nil

Course Objectives

- To study the origin and formation of Petroleum , the principles and process of petroleum refinery operation, and the transportation & storage of Petroleum
- To know testing methods of petroleum products.

Syllabus

Origin and formation of Petroleum, Drilling operations, Evaluation and Characterization of crude. Transportation & Storage of Petroleum, pre-treatment of Crude, Atmospheric distillation &Vacuum distillation of crude, Arrangement of tower, Cracking, Reforming, Isomerisation, Alkylation, Polymerization. Treatment techniques for Petroleum products, Lube oil treatment. Analysis of petroleum products. .

Expected Outcome

The students will be able to

i. understand the basic concepts of Primary and Secondary petroleum processing
ii. evaluate and characterize of crude oil.
iii. Know about the storage and transportation of Petroleum products

Text books:

1. Baskara Rao B.K, Modern Petroleum Refinery Process, Oxford& IBM
2. Dr.Ram Prasad, Petroleum Refining Technology, Khanna Publishers

References:

1. Austin G.T, Shreves Chemical Process Industries, McGraw Hill
2. Dr.Kochu Baby Manjooran S, Modern Petroleum Chemistry, Kannatheri Publication, Cochin
3. Gopala Rao M & Sitting M, Drydens Outline of Chemical Technology, Affiliated East West Press
4. I D Mall, Petrochemical Process technology, Macmillan
5. Nelson W.L, Petroleum Refinery Engineering, McGraw Hill

Course Plan

Module	Contents	Hours	Sem. Exam Marks
I	Origin and formation of petroleum. Exploration, Drilling and Secondary recovery methods of crude. Storage and transportation of crude and products. Status of Petroleum industry in India. Composition of crude-Evaluation of oil stock.	7	15%
II	Petroleum processing-Dehydration and desalting of crude-Furnace-Distillation of crude- Arrangement of tower, Atmospheric and Vacuum distillation unit.	7	15%
	FIRST INTERNAL EXAMINATION		
III	Thermal Conversion process. Thermal cracking-Mechanism of Thermal cracking - Visbreaking-Coking – Delayed coking, Fluid coking and Flexi coking.	6	15%

IV	Catalytic conversion process-Catalytic cracking-Types of Catalyst-Types of reaction-Mechanism of Catalytic cracking. Catalytic reforming-Reforming reaction-Catalyst-Process description. Process description and application of Hydro cracking, Polymerization, Alkylation, Isomerisation	8	15%
SECOND INTERNAL EXAMINATION			
V	Treatment techniques. Production and treatment of L.P.G. Treatment of Kerosene- Edeleanu process. Treatment of Lube-Sulphuric acid treatment, Clay treatment, Phenol extraction. Dewaxing methods. Hydrotreating Process.	8	20%
VI	Properties, test methods and uses of Refinery products such as L.P.G, Gasoline, Jet fuel, Kerosene, Diesel fuel, Lubricating oil, Waxes, Bitumen and Carbon Black.	6	20%
END SEMESTEREXAMINATION			

Question Paper Pattern:

Maximum Marks: 100 Exam Duration: 3 Hours

Part A: There shall be **Three questions** uniformly covering Modules 1 and 2, each carrying 15 marks, of which the student has to answer any **Two questions**. At the most 4 subdivisions can be there in one main question with a total of 15 marks for all the subdivisions put together.
(2 x15= 30 Marks)

Part B: There shall be **Three questions** uniformly covering Modules 3 and 4, each carrying 15 marks, of which the student has to answer any **Two questions**. At the most 4 subdivisions can be there in one main question with a total of 15 marks for all the subdivisions put together.
(2 x15= 30 Marks)

Part C: There shall be **Three questions** uniformly covering Modules 5 and 6, each carrying 20 marks, of which the student has to answer any **Two questions**. At the most 4 subdivisions can be there in one main question with a total of 20 marks for all the subdivisions put together.
(2 x20= 40 Marks)