20PEB303					Petroleum Refinery Engineering					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
2	0	0	2	2	25	50	25	--	--	100

COURSE OBJECTIVES

- To provide the concept of petroleum refining and explain the different methods of petrochemical reactions and their applications
- To provide the importance of various refining processes and their applications
- To explain the significance petrochemicals productions

UNIT 1 **7 Hrs.**

Types of crudes, crude composition Characteristics and classification–Crude oil properties. IS 1448: Standard –Testing of Petroleum crude–Products: Specifications and their Significance.

UNIT 2 **6 Hrs.**

Pre-treatment of crude for Refining–Dehydration and desalting–Atmospheric distillation, Vacuum distillation of residue products–Treatment techniques for vacuum distillates with different processes like solvent extraction –DE asphalting, dewaxing, hydro fining, catalytic dewaxing and clay contact process– Production of lubricating oils. Hydro cracking, principles, process requirements, product yields and qualities and reside-cracking –Hydrotreating –Sulphur removal, hydro finishing.

UNIT 3 **6 Hrs.**

Thermal cracking – Processes, operating parameters, feed stock selection and product yields, Advantages –Types and functions of secondary processing – Visbreaking – Processes, operating parameters and advantages–Coking –Operating parameters and advantages. Fluid catalytic cracking –processes, operating parameters, feed stock selection and product yields –Advantages.

UNIT 4 **7 Hrs.**

Principle, Processes, Operating Parameter and advantages of Reforming – Isomerisation – Alkylation – Polymerization. Asphalt manufacture, Air blowing technology, Bitumen Types and their properties, Acid gas removal and sulphur removal techniques.

Max. 30 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 - Introductory information about origin, exploration and production of petroleum crude and understand their properties with the help of standard testing protocols.

CO2- Recognize various primary crude processing techniques like distillation, de-asphalting, hydrocracking, hydrotreating, and their supporting processes.

CO3- Recognize various secondary thermal cracking, catalytic cracking and reforming and coking and their supporting processes.

CO4- Understanding the process technologies for reforming, isomerization, alkylation and polymerization unit process.

CO5- To understand and evaluate various residue processing schemes.

CO6- To apply the finishing processes to petroleum products for meeting the market specifications in view of fuel quality and environmental regulations.

TEXT/REFERENCE BOOKS

1. Dr. B.K. Bhaskara Rao, Modern Petroleum Refining Processes (5th Edition)
2. Dr. B.K. Bhaskara Rao, A Text Book on Petrochemicals.
3. Marshall Sitting, Dryden's Outlines of Chemical Technology

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100 **Exam Duration: 3 Hrs**

Part A/Question: <Short Notes, Problems, Numerical> <5-7 > Marks (each)

Part B/Question: <Justification, Criticism, Long answers, Interpretation > <8-10> Marks (each)