

22PCM311T					Petrochemical Processes III					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hours/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	0	0	3	3	25	50	25	--	--	100

## COURSE OBJECTIVES

- To have a clear idea of the Aromatic Industry, its structure and constitution.
- To understand the feedstock requirements for production of primary aromatics and aromatic derivatives
- To study the processes to produce primary aromatics with emphasis on engineering aspects.
- To learn processes for the production of various commercially important petrochemicals.
- To learn the processes for production of aromatic derivatives and monomers.
- To understand the unique aspects of commercial monomers and their polymerization.

### Unit I : The Structure and feedstocks of Aromatic Industry

9 Hr.

Petroleum feedstocks for aromatics production; their origin and availability. The nature of aromatic production complexes; refineries, olefin production facilities, coal based processes. Aromatic content in feedstocks. Strategies for aromatic separations.

### Unit II : Aromatic production and purification.

12 Hr.

Aromatics from pyrolysis gasoline, its composition and purification, Aromatics from reformates, reforming processes and catalysts, product profiles and separation of aromatics. Separation of xylenes, xylene isomerization, Parex process for p xylene production. Separation of ethylbenzene from xylenes. Styrene production technologies.

### Unit III : Aromatic derivatives and other petrochemicals.

10 Hr.

Synthesis of phenol and acetone, phthalic anhydride, maleic anhydride, butanediols, dimethyl terephthalic, substituted benzenes, cyclohexane, hexamethylene diamine, Vinyl monomers; vinyl acetate, ethylene dichloride, acrylonitrile. Napthalene and its derivatives

### Unit IV : Monomer production processes and Polymers

8 Hr.

Terephthalic acid and polyethylene terephthalate, caprolactam and nylon 6, vinyl chloride and PVC, Polystyrene synthesis, diisocyanates, polyols and synthesis of polyurethanes.

Max. 39 Hr.

## COURSE OUTCOMES

On completion of the course, student will be able to

**CO1:** Comprehend the structure of aromatic production facilities

**CO2:** Evaluate the effect of feedstocks on aromatic production.

**CO3:** Analyse the effect of various parameters on aromatic production.

**CO4:** Study the synthesis of various commercial petrochemicals.

**CO5:** Study some commercial monomer production processes

**CO6:** Familiar with the current developments in various aromatic production technologies.

**TEXT/REFERENCE BOOKS**

1. Moulijn, J. A., Makkee, M and Van Diepen, A. E. Chemical Process Technology, Second Edition, Wiley, 2013.
2. Chauvel, A and Lefebvre, G. Petrochemical Processes II, Technip, Paris, 1989
3. Meyers, R A. Handbook of Petrochemical Production Processes, McGraw-Hill, 2005.
4. Asua, J, M. Polymer Reaction Engineering, Blackwell Publishing, 2013.

**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 Hr.**

50 Marks

50 Marks