

## CH358: PETROCHEMICAL TECHNOLOGY

CREDITS = 6 (L = 4, T=0, P = 2)

1. **ORIGIN, OCCURRENCE AND CHARACTERIZATION:** Origin of petroleum crude oil. Evaluation of crude oil, evaluation and characterization of crude oil: TBP and other distillation tests. Petroleum products, their properties, specification and testing, different properties like flash point, fire point, smoke point, aniline point, carbon residue, kinematic viscosity, pour point, freezing point etc. 8 Hours
2. **REFINERY OPERATIONS:** Use of crude book data. Petroleum refinery distillation, pre-fractionation and atmospheric distillation of crude. Process design for atmospheric distillation. Stabilization of naphtha. Vacuum distillation of RCO. Reforming of naphtha. Other secondary processes like Vis-breaking, Furfural/Phenol/NMP extraction, Solvent dewaxing, propane deasphalting. Delayed coking process. FCC unit. Hydrotreatment processes in refining: hydro-desulfurisation, hydrofinishing, Hydrocracking. Production of lube oil base stock. Refinery equipment: furnaces, distillation columns, reactors, pumps, compressors and piping. Environmental impact of refineries. 16 Hours
3. **SURVEY OF PETROCHEMICAL INDUSTRY;** Availability of different feed stocks; Production, purification and separation of feed stocks; Chemicals from methane; Production and utilization of synthesis gas, oxo reactions, etc.; Production of and chemicals from acetylene; Naphtha cracking; Chemicals from C<sub>2</sub>, C<sub>3</sub>, C<sub>4</sub> and higher carbon compounds; Catalytic reforming of naphtha and isolation of aromatics; Chemicals from aromatics; Synthetic fibres, detergents, rubbers and plastics; Petroleum coke; 12 Hours
4. **DESIGN:** Elements of design of steam reformer, naphtha cracker, catalytic reformer, etc. 4 Hours

### REFERENCE BOOKS:

Title: Petrochemical Technology  
Author: I D Mal  
Publisher: Macmillan

Title: Modern Petroleum Refining Processes  
Author: B K B Rao  
Publisher: Oxford and IBH

Title: Petroleum Refinery Engineering  
Author: Nelson, W L  
Publisher: McGraw Hill Inc.

## **LIST OF EXPERIMENTS**

1. To determine Flash point and Fire point of liquid petroleum products.
2. Determination of Cloud point and Pour point of heavy petroleum product.
3. To Determine the Aniline point of the supplied oil samples using aniline point apparatus and to find out the diesel index number of the diesel.
4. To Determine the Softening point of a given sample of asphaltic bitumen.
5. To Determine the Smoke point of the given sample of kerosene.
6. To find out the Carbon residue of supplied sample of fuel oil using Conradson carbon apparatus.
7. To Determine the distillation characteristics of a given motor fuel by ASTM Distillation.
8. To Determine the Surface tension of a given liquid at ambient temperature.
9. To Determine the viscosity of a given sample using Oswald viscometer.