

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN CHEMICAL ENGINEERING

SEMESTER: V

Subject Name: **Petroleum Refining and Petrochemical Technology**

Sr. No.	Course Content
1.	Introduction: 1.1 Occurance & history of Petroleum. 1.2 Crude Petroleum oil reserves in India. 1.3 Refineries development in India. 1.4 Various refineries located in India. 1.5 Composition of Petroleum. 1.6 Classification of Petroleum
2.	Fractionation of Petroleum: 2.1 Refinery products. 2.2 Dehydration & Desalting of crude oil. 2.3 Brief idea & sketches of pipe still heater. 2.4 Straight run distillation of crude oil. 2.5 Physical properties of petroleum products and its measurements : 2.5.1 Petrol 2.5.2 Diesel 2.5.3 Kerosene 2.5.4 Lubricant oil 2.5.5 Grease 2.6 Types of Refineries 2.7 Refineries processes. 2.7.1 Physical changes. 2.7.2 Chemical changes.
3.	Chemical Processes in Refinery: 3.1 Cracking. 3.1.1 Purpose of cracking. 3.1.2 Effect of temp. & Process on cracking. 3.1.3 Difference between thermal cracking & catalytic cracking. 3.1.4 Catalytic cracking by fluidised bed. 3.2 Reforming. 3.2.1 Purpose of Reforming. 3.2.2 Difference between thermal reforming. & catalytic reforming. 3.2.3 Reforming by platinum catalyst method.
4.	Treatment Techniques: 4.1 Purpose of sulphur removal. 4.2 List various of sulphur removal. 4.3 Sulfur removal by doctor's sweetening method & catalytic desulfurization method. 4.4 Treatment of kerosene by liquid SO ₂ extraction process. 4.5 Solvent extraction processes. 4.5.1 Furtural extraction method 4.5.2 Phenol extraction method 4.5.3 Difference between both the method 4.6 Duo sol (Selecto) extraction process.

5.	Dewaxing: 5.1 Purpose of dewaxing. 5.2 Dewaxing without solvent. 5.3 Dewaxing with solvent. 5.3.1 Ketone dewaxing & propane dewaxing process
6.	Petrochemicals: 6.1 Development of petrochemical industry in Gujarat & in India. 6.2 Manufacturing of C1 compounds. 6.2.1 Methanol 6.2.2 Formaldehyde 6.3 Manufacturing of C2 compounds. 6.3.1 Ethylene dichloride. 6.3.2 Vinyl chloride. 6.3.3 Ethylene Oxide. 6.4 Manufacturing of C3 compounds. 6.4.1 Polypropylene. 6.4.2 Propylene oxide. 6.5 Chemicals from aromatics. 6.6 Phenol by benzene sulfonate process

Laboratories Experiences:

1. Determination of flash point by Penskey Martin method.
2. Determination of fire point by Penskey Martin method.
3. Aniline point measurement of petroleum product.
4. Determination of penetration number of petroleum product.
5. Carbon residue by Ram's bottom method.
6. Carbon residue by Conradson method.
7. Carbon residue by Conradson method.
8. Measurement of smoke point.
9. Measurement of cloud point.
10. Measurement of pour point.
11. Measurement of initial & final boiling point of any petroleum product.
12. Measurement of Viscosity by Red wood viscometer.

Reference Books:

1. Modern Petroleum Refining Processes, By B.K.Bhaskar Rao.
2. Outlines of chemical Technology, By Dryden.
3. A Text on Petrochemicals, By B.K.Bhaskar Rao.
4. Industrial Chemicals, By Faith, Keyes and Clark.