PETROLEUM REFINING AND PETROCHEMICALS

Course Code: 13CH1130

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Course Educational Objectives:

Refining operations constitute the major applications of chemical engineering This course

- ✤ Introduces the student to the scenario of petroleum refining.
- ✤ Operations involved in petroleum refining.

Course Outcomes:

After completion of the course the student would be able to

- ✤ Understand the importance of cracking.
- ✤ Understand the difference between thermal and catalytic cracking.
- ✤ Understand the reforming process.

UNIT-I (12 Lectures)

Origin, formation and composition of petroleum: Origin and formation of petroleum, Reserves and deposits of world, Indian Petroleum Industry.

Petroleum processing data: Evaluation of petroleum, thermal properties of petroleum fractions, important products, properties and test methods.

UNIT-II (12 Lectures)

Fractionation of petroleum: Dehydration and desalting of crudes, heating of crude pipe still heaters, distillation of petroleum, blending of gasoline.

Treatment techniques: fraction-impurities, treatment of gasoline, treatment of kerosene, treatment of lubes.

UNIT-III (12 Lectures)

Thermal and catalytic processes: Cracking, catalytic cracking, catalytic reforming, Naphtha cracking, coking, Hydrogenation processes, Alkylation processes, Isomerization process.

UNIT-IV (12 Lectures)

Petrochemical Industry – Feed stocks

Chemicals from methane: Introduction, production of Methanol, Formaldehyde, Ethylene glycol, PTFE, Methylamines.

UNIT-V (12 Lectures)

Chemicals from Ethane-Ethylene-Acetylene: Oxidation of ethane, production of Ethylene, Manufacture of Vinyl Chloride monomer, vinyl Acetate manufacture, Ethanol from Ethylene, Acetylene manufacture, Acetaldehyde from Acetylene.

TEXT BOOKS:

1. Nelson. W.L. "*Petroleum refining Engineering*", 4 Edition, Mc Graw Hill, New York, 1969.
2. Rao, B.K.B. "*Modern Petroleum Refining Processes*", 4 Edition, Oxford and IBH Publishing, 2002.

REFERENCES:

1. Goldstine. R.F. "*The Petroleum Chemicals Industry*", Taylor and Francis, London, 1967.
2. Gruese. W.S.and Stevens, D.R. "*Chemical Technology of Petroleum*", McGraw Hill, 1980.
3 Chauvel. A. and Lefevrev, "*Petro Chemicals*", Volume 1 and 2, Gulf Publishing company 1989.