

UCH403 CHEMICAL TECHNOLOGY-II

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Prerequisite(s): None

Study of the following chemical industries/processes involving process details, production trends, material and energy balances, flow sheets, engineering problems pertaining to materials of construction, regeneration/recycling, environmental and energy conservation measures.

Petroleum and Petrochemical Industries: Origin and composition of petroleum, classification of petroleum, Manufacture of petroleum products and their uses and properties. Petroleum refining, physical and chemical conversion products, lubricating oils, petrochemical precursors, methane, olefines, acetylenes and aromatics.

Coal and Coal Chemicals: Types of coal, destructive distillation of coal, distillation of coal tar, chemicals from coal.

Pulp and Paper Industries: Cellulose derivatives, pulp, paper and boards. Types of raw material for pulping, various pulping methods, recovery of chemicals from black liquor. Manufacture of paper, quality improvement of paper.

Sugar and Starch Industries: Raw and refined sugar, byproducts of sugar industries, Starch and starch derivatives.

Oils and Fats: Types of oil, different fatty acids, extraction of oil from seeds, oil purification, hydrogenation of oil.

Soaps and Detergents: Types of soaps, soap manufacture, recovery and purification. Types of detergents, their cleansing action.

Surface Coating Industries: Paints, Pigments, Varnishes, Industrial coatings.

Food Industries: Food processing, Food additives and preservatives, food processing equipments.

Fermentation and Enzyme Industries: Production of industrial alcohol, acetic acid, citric acid and lactic acid. Introduction to enzymes and their applications.

Polymers: Monomers, Thermoplastic and Thermosetting materials (such as polyethylene, polypropylene, polyvinyl chloride, polystyrene) and PF resins; Epoxy and polyesters - Natural rubber; Synthetic rubber such as SBR, NBR, CR - Fundamental methods of processing of synthetic Rubbers.

Synthetic Fibre and Film Industries: Viscose rayon, cuprammonium and cellulose acetate, nylons, polyesters, acrylics.

Pharmaceutical Industries: Introduction to pharmaceutical products - Synthesis and recovery,

Text Books

1. Rao, M.G. and, Sittig, M., *Dryden's Outlines of Chemical Technology for the 21st century*, Affiliated East West (1998) 3rd ed.
2. Austin, G.T., *Shreve's Chemical Process Industries*, McGraw Hill (1998) 5th ed.
3. Groggins, P.H., *Unit Processes in Organic Synthesis*, Tata McGraw Hill (2003) 5th ed.

Reference Book

1. Faith, W.L., Clark, R.L. and Keyes, D.B., *Industrial Chemicals*, John Wiley (1980) 4th ed.
2. Garry, James H., Handwerk, G. E. and Kaiser, M.J., *Petroleum Refining Technology and Economics*, Taylor & Francis (2007).