CH225	CHEMICAL TECHNOLOGY	L	T	P	C	Int	Ext
		3	-	-	3.0	30	70

Semester IV [Second Year]

COURSE OBJECTIVES:

1. To impart the knowledge of Unit operations unit processes involved in manufacture of widely employed inorganic chemicals like Chlor-alkalis, cements, Glasses and industrial gases
2. To provide the knowledge of Unit operations unit processes involved in manufacture of Fertilizers like Ammonia, Urea, Nitric acid, Phosphoric acid and superphosphates
3. To impart the knowledge of Unit operations unit processes involved in manufacture of organic chemicals like Rubbers, fibres, plastics and soaps
4. To impart the knowledge of Unit operations unit processes involved in manufacture of organic chemicals like Papers, Sugars, Fermentation products and Petroleum refining

COURSE OUTCOMES:

After successful completion of the course, the students are able to

1. Demonstrate chemical technologies used in the manufacturing of Chlor-alkalis & Cements, Glasses and Industrial gases
2. Interpret manufacturing process for Nitrogen, phosphorous fertilizers, Sulphuric acid and Hydrochloric acid
3. Describe organic chemical technologies involved in Industrial Processes such as phenol-formaldehyde, Styrene - Butadiene Rubber polymerizations, Synthetic fibres, oils, soaps and detergents manufacture
4. Interpret the manufacturing operations and processes for the production of natural products (sugar, pulp and paper, Fermentation industry) and Petroleum refining

UNIT I [CO:1] **(12)**

Introduction: Objectives, unit processes and unit operations. General Fundamentals.

Alkali Industries: Soda ash, Caustic soda and Chlorine.

Cement: Raw materials, types, manufacture.

Glass: Raw materials, manufacture.Industrial gases: Nitrogen, Hydrogen and Oxygen.

UNIT II [CO:2] **(12)**

Nitrogen industries: Synthetic Ammonia, Urea, Nitric acid. **Phosphate Industries:** Phosphoric Acid, Calcium phosphate and Super phosphate

Sulfur and sulfuric acid: Manufacture of Sulfur and Sulfuric acid.**Hydrochloric acid:** Manufacture of Hydrochloric acid.

UNIT III [CO:3] **(12)**

Synthetic Fibres: Classification, manufacture of Nylon 6,6, Polyester Fibre, Viscose rayon Fibre.**Plastic industry:** Classification of plastics, Manufacture of phenols (From Cumene, Toluene), Formaldehyde, Manufacture of phenol-formaldehyde resin.

Rubbers: Classification, Natural Rubber, monomers of Synthetic Rubber, manufacture of SBR.**Oils, soaps and detergents:** Definitions, Hydrogenation of oils, continuous process for the production of Fatty acids and Soap, production of Detergents.

UNIT IV [CO:4] **(12)**

Petroleum Refining: Constituents of petroleum, Products of Refining, petroleum refining process-Cracking, Reforming. **Pulp and paper industry:** Methods of pulping, production of Sulphate and Sulphite pulp, production of Paperâ€“wet process.

Sugar and starch industry: Manufacture of Cane sugar, production of starch from maize. Fermentation industry: Manufacture of Alcohol from molasses, manufacture of Penicillin.

LEARNING RESOURCES:

TEXT BOOK(s):

1. Drydens Outlines of Chemical Technology for 21st Century by M.Gopal Rao and M.Sittig,3rd edition, East West Press(2010).
2. Shreveâ€™s Chemical Process Industries byG.T. Austin, McGraw Hill, 5th edition (1984)

REFERENCE BOOK(s):

1. A Text Book of Chemical Technology (Volume I&II), G.N.Panday, Vikas Publishers
2. Chemical Process Technology by Jacob A.Moulijin, MIchielMakkee and Annelies Van Diepen, John Wiley & Sons(2001)

WEB RESOURCES:

https://nptel.ac.in/courses/103103220