

OUTLINES OF CHEMICAL PROCESS INDUSTRIES**Course Code: 22CH1108****L T P C**
3 0 0 3**Course Outcomes:** At the end of the course the student shall be able to**CO1:**explain the manufacturing process of Soda ash, Chlorine and Fertilizers. (L2)**CO2:**explain the manufacturing of various inorganic chemicals using a neat process flow diagram. (L2)**CO3:**illustrate the manufacturing of various organic chemicals and polymers using a neat process flow diagram. (L3)**CO4:**illustrate the production and refining of petroleum. (L3)**CO5:**explain the basics of antibiotics, hormones, vitamins, steroid hormones and manufacturing process of paper. (L2)**UNIT-I****10 Lectures**

Chlor-alkali Industries: Soda ash, caustic soda and chlorine

Nitrogen industries: synthetic ammonia, urea, nitric acid (ammonium nitrate), ammonium chloride, ammonium phosphate and complex fertilizers

Learning outcomes: After the completion of the Unit I, the student will be able to

1. illustrate the manufacturing of synthetic ammonia, urea, nitric acid, ammonium nitrate, ammonium chloride, ammonium phosphate and complex fertilizers.(L2)
2. explain the process of manufacture of ammonium nitrate, ammonium chloride, ammonium phosphate and complex fertilizers.(L2)
3. explain the manufacture of Soda ash, caustic soda and chlorine. (L2)

UNIT-II**10 Lectures**

Sulphur and sulphuric acid, manufacture of sulphuric acid, phosphoric acid.

Cement manufacture, special cements, miscellaneous calcium compounds, magnesium compounds.

Learning outcomes: After the completion of the Unit II, the student will be able to

1. explain the manufacture of Sulphuric acid and phosphoric acid.(L3)
2. illustrate the manufacture of cement.(L2)
3. explain the manufacture of calcium and magnesium compounds (L2)

UNIT-III**10 Lectures**

Manufacture of phenols, formaldehyde, vinyl chloride and vinyl acetate, manufacture of phenol-formaldehyde resin and polyvinyl chloride polymer, SBR, manufacture of Nylon 66.

Learning outcomes: After the completion of the Unit III, the student will be able to

1. describe the manufacturing process of phenols, formaldehyde, vinyl chloride and vinyl acetate. (L2)
2. explain the manufacture of phenol formaldehyde resin, polyvinyl chloride polymer. (L3)
3. explain the manufacture of SBR and Nylon 66. (L3)

UNIT-I V**10 Lectures**

Oils: Definition, constitution, extraction and expression of vegetable oils, refining and hydrogenation of oils.

Soaps and detergents: Definitions, continuous process for the production of fatty acids, glycerin and soap, production of detergents

Petroleum: Origin, classification, composition of crude oil, production of crude oil, distillation of crude petroleum, refining-methods, uses of products.

Learning outcomes: After the completion of the Unit IV, the student will be able to

1. explain the extraction, refining and hydrogenation of oils.(L3)
2. discuss the process of manufacture of soaps and detergents. (L2)
3. illustrate the production and refining of petroleum.(L2)

UNIT-V**10 Lectures**

Pulp and paper industry: methods of pulping, production of sulphate and sulphite pulp, production of paper –wet process

Pharmaceutical Industries: Introduction to Antibiotics, Hormones, and Vitamins, Biologicals, Steroid hormones.

Learning outcomes: After the completion of the Unit V, the student will be able to

1. classify methods of pulping.(L4)
2. describe the production of paper by wet process(L2)
3. explain the basics of antibiotics, Hormones, Vitamins, Steroid hormones.(L3)

Text Books:

1. Austin. G.T., *Shreve's Chemical Process Industries*, Mc.Graw-Hill.5th edition.1985.
2. Gopal Rao M. and Sittig M., *Dryden's Outlines of Chemical Technology*, 3rd edition, East-West Press Pvt Ltd., New Delhi, 2000.

References:

1. B.K. Sharma, *Industrial Chemistry*, GOEL publishing house, 2000.
2. K.H.Dav & F.S. Berner and S.C. Bhatia, *Handbook of industrial chemistry Vol I & II*, CBS Publishers
Chemical Technology: G.N. Panday, Vol 1& Vol II.