

CHE-211: Chemical Process Technology

Credit Hours: 3-0

Pre-requisites: None

Course Objectives

- To familiarize students with conversion of raw materials into finished products on industrial scale using conventional and green technology.
- Development of Chemical Process Industry in Pakistan

Course Contents

- i. Basic Industries: Silicate and allied products, Glass
- ii. Ceramics and Cement; Phosphorus
- iii. Heavy Chemicals: Sulfuric Acid, Nitric Acid
- iv. Sodium carbonate and sodium hydroxide
- v. Water conditioning
- vi. Soap and Detergents; Leather processing and tanning
- vii. Refractories; Types, properties, manufacture and major uses
- viii. Gas and oil processing
- ix. Synthesis Gas production from coal and biomass
- x. Reforming of natural gas for synthesis gas production
- xi. Brief treatment of Oil refining
- xii. Fertilizers; Urea, Potassium Nitrate, Super phosphate, Di-ammonium Phosphate
- xiii. Industrial gases; Carbon dioxide, Hydrogen, Nitrogen
- xiv. Chemical and fuels from Biomass
- xv. Pulp and paper; Pulp manufacture, Comparison
- xvi. Description of different methods available; Paper making
- xvii. Sugar and Agro based industry. Biomass processing
- xviii. Fermentation Industries: Industrial alcohol and industrial solvents
- xix. Food processing industry; food processing techniques, food by products.
- xx. Plastic industry; Plastics, Types and their properties, Polymerization, Manufacture of plastics, Uses; synthetic fibers; Paints and Varnishes
- xxi. Synthetic fuels via Fischer-Tropsch reaction

Course Outcomes

After taking this course, student should have knowledge how to produce finished products on industrial scale using conventional and green technology.

Recommended Books

- Austin, G. T. (1997). Shreve's Chemical Processes Industries (6th ed.). McGraw Hill International.
- Groggins, P. H. (2005). Unit Processes in Organic Synthesis (4th ed.). Tata McGraw Hill Book Company, Inc.
- Pandey, G. N. (2000). A Textbook of Chemical Technology (2nd ed., Vol-I & II). Vikas Publishing House (Pvt) Limited.
- Kent, J. A. (2000). Riegel's Handbook of Industrial Chemistry. Springer/Van Norstrand/Rein Hold.
- Kirk-Othmer. (1999). Encyclopedia of Chemical Technology. Inter Science Publishers.
- Haidari, I. (1992). Chemical Industry in Pakistan. Industrial Research Service Karachi, Pakistan.