



Code	Subject Title	Cr. Hrs	Semester
CHEM-309	Applied Chemistry	4	V
Year	Discipline		
3	Chemistry-I, II		

SYLLABUS OUTLINE:**1. Chemical Industrial Unit Operations:**

Brief introduction to Chemical Industry with reference to Pakistan, Elementary treatment of general unit operations commonly used in Industry such as heat transfer; Evaporation; size Reduction; Screening; Filtration and Distillation.

2. Industrial Inorganic Synthesis:

Raw materials; Chemical processes involved; flow sheet diagrams with all the important parameters concerned with the manufacturing of Sulphuric acid; Hydrochloric acid; caustic Soda; Washing soda; Applications of these chemicals in industry.

3. Cement Industries:

Cement raw materials used for cement manufacturing, dry process, wet process, semi wet process, special cement, chemistry involved in hydration of cement, setting of cement, setting time.

4. Water Softening and Scale Removing:

Water hardness; its measurement and removal; methods used for water softening including ion-exchange and reverse osmosis, distillation and precipitation. Types of boiler scales. Chemical and mechanical methods to eliminate the scaling.

RECOMMENDED BOOKS:

1. Industrial Organic Chemicals, by H.A.Witcoff and B.J.Reuben, John Wiley & Sons Inc. New York.
2. Water Supply and Sewerage, T.J.McGhee, McGraw Hill Book Co. New York.(1991)
3. Unit operations in Chemical Engineering, Chattopadhyay, Khanna Publishers, Delhi-6.(1993).
4. Chemical Process Design, Robin Smith, McGraw Hill Book Co. New York.(1995).
5. Hand Book of Industrial Chemicals, By SIRI Board of Consultants and Engineers,
6. Small Industries Research Institute, New Delhi (1995)
7. Small Medium and large Scale Industries, A.K. Sirivastawa, Small Industries Research Institute, New Delhi (1996).
8. The Chemistry of Cement, H.F.W. Taylor, Academic Press, London, 1964.
9. Shereve's Chemical Process Industries, 5th Ed.1975 by G.T.Austin McGraw Hill Book Co. New York.
10. Industrial chemistry, B. K. Sharma Krishna Prakashan Media (P) Ltd., Ed-15 (2006)