

Course Title: Industrial Chemistry**Course Code: CH-830****Credit Hours: 3-0****Prerequisite: Nil****Course Objectives**

To introduce the student with the synthesis, production and industrial applications of polyurethane, a truly versatile material which exhibits a variety of properties typical of multi phase materials.

Course Outcomes

After having completed the course, students will have experience in the relevant industries. Further, visits of corresponding industries will give hand on experience to the students.

Course Contents

Petrochemicals: Polyurethanes Chemistry and Technology, Polysiloxanes systems in paint, adhesives and food industry, Polyester systems, Preparation and characterization of Nylon, Biodegradable plastics, Curing catalysts and their mechanisms, Micro phase segregation; Synthesis cross-linking versus segmented products, Chemical thermodynamics and stoichiometry, Property enhancement through Stoichiometry and Processing variables, Applications in Auto mobile components (Fenders and body parts), Binders for PBX and propellants, Adhesives and sealants, Role of bonding agents and surface chemistry, Reaction injection molding, Spray coating, costing and electroplating industry; Impact materials, Smart materials, Chemorheology (rheology + kinetics), Upholstry and leisure products with reference to soft and rigid foam chemistry and sports goods.

Solar Cells and its types, Flexible Solar Cells, Solar Fuel Cells, Batteries, Supercapacitors. Membranes (Gas and Liquid Separation), Iron, Steel and Alloys: Iron ores, constituents and their classification, manufacturing of iron and steel, types of iron and steel, metal extractions and production of Alloys. Analysis of effluent from industrial wastes. Recovery of chromium from tannery effluents. Preparation of Shaving creams. Chlorine in bleaching powder.

Recommended Books

1. L.N. Philips and B.B.V. Parker, Properties " " Polyurethanes, Chemistry, Technology, and , the Plastic Institute, London (1984).
2. "Scycher " ' s Handbook of Polyurethanes

3. The Polyurethanes " " Michael Scycher, Amazon & CRC (1999) David Randell & Steve Lee, Amazon & CRC (2000)
4. Frost, A. A., and Pearson, R. G., Reaction Mechanism, 2nd Edition John Wiley and sons, Inc. (1961)
5. Roger ' ' s Industrial Chemistry. Von Norstand Co. N. Y.
6. Chemical Process Industries by Shreve and Dum. McGraw Hill.
7. Vogel s Textbook of Qantitative chemical analysis 6th edition., J.Mendham, RC Denney, JD Barnes, MJK Thmas. The School of Chemical and Life Sciences University of Greenwich London.