Course code	Course Name	L-T-P Credits	Year of Introduction
CH304	INORGANIC CHEMICAL TECHNOLOGY	3-0-0-3	2016

Prerequisite : Nil

Course Objectives

- To impart knowledge of various process engineering technologies and process flow sheeting methods
- To develop an understanding of the about unit process and unit operations in various industries.
- To enable the students to select the best process for a product among the alternative methods available in the process industry.

Syllabus

Introduction to chemical technology, Industrial gases and industrial acids, Fertilizers-ammonia manufacture, manufacture of nitrogenous fertilizers, phosphatic fertlizers, compounded and complex fertilizers, marine chemicals, electro thermal products, oil fats and waxes, soaps and detergents.

Expected Outcome

The student will be able to

i. identify unit operation and unit process that are employed in process plants
ii. develop process flow diagrams for manufacturing process.
iii. solve the engineering problems that may occur during various stages of production in process industries.

Text Books:

1. Austin G. T., Shreve's Chemical Process Industries 3/e, McGraw Hill, 1984.
2. Dryden C. E., Outline of Chemical Technology, 2/e, East West Publishers, 1997.
3. Shukla S. D. and G. N. Pandey, "A Text Book of Chemical Technology. Vikas Publishing House, 1986.

References:

1. Chemtech Vol. I – IV, Chemical Engineering Education Development Centre, Indian Institute of Technology, Madras, 1979.
2. Kirk-Othmer Encyclopaedia of Chemical Technology, John Wiley and Sons
3. Ullmann's Encyclopaedia of Industrial Chemistry, John Wiley and Sons

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	Introduction to Chemical Technology, Sectors of Chemical Industry, Overview of Indian Chemical Industry. Industrial gases: Manufacture, properties and uses of hydrogen, oxygen, nitrogen, carbon dioxide Industrial acids: Hydrochloric acid manufacture by synthesis process. Manufacture of sulphur and sulphuric acid by DCDA process. phosphorus and phosphoric acid: wet process phosphoric acid, electric furnace phosphorus and phosphoric acid	8	15%

II	Manufacture of sodium chloride, sodium sulphate, sodium silicate, by products of salt industry Soda ash: Manufacture by Solvay process Chlorine and caustic soda: Manufacture by electrolytic process - Diaphragm cells, membrane cells, mercury cell, baking soda	6	15%
FIRST INTERNAL EXAM			
III	Glasses: Types, raw materials and methods of manufacture. Ceramics: Types, raw materials, processing methods - drying and firing of ceramic wares.	6	15%
IV	Surface coating industries: pigments, paints, varnishes, lacquers. Refractories: classification, manufacture and testing of refractories	6	15%
SECOND INTERNAL EXAM			
V	Fertilizers: Ammonia manufacture, manufacture of urea by once through process and total recycle process Phosphatic fertilizers - super phosphates. Manufacture of nitrogenous fertilizers - ammonium chloride, ammonium sulphate and urea Compound and complex fertilizers:- MAP and DAP, urea ammonium phosphate, NPK fertilizers.	9	20%
VI	Electrothermal products: Manufacture, properties and uses of graphite, fused alumina, silicon carbide, carbon disulphide. Cement: portland cement, constituents, types, raw materials and manufacturing processes.	7	20%
END SEMESTER EXAM			

Question Paper Pattern

Maximum Marks: 100 Exam Duration: 3 Hours

Part A: There shall be **Three questions** uniformly covering Modules 1 and 2, each carrying 15 marks, of which the student has to answer any **Two questions**. At the most 4 subdivisions can be there in each main question with a total of 15 marks for all the subdivisions put together. (2 x15= 30 Marks)

Part B: There shall be **Three questions** uniformly covering Modules 3 and 4, each carrying 15 marks, of which the student has to answer any **Two questions**. At the most 4 subdivisions can be there in each main question with a total of 15 marks for all the subdivisions put together. (2 x15= 30 Marks)

Part C: There shall be **Three questions** uniformly covering Modules 5 and 6, each carrying 20 marks, of which the student has to answer any **Two questions**. At the most 4 subdivisions can be there in each main question with a total of 20 marks for all the subdivisions put together. (2 x20= 40 Marks)