

Subject: Chemical Process Industries

CHE-115 1 ST Semester Pre-req.	Chemical Process Industries	3CH	
		Theory (3)	
	Nil	Category	Foundation Course
Course Contents as per PEC Guidelines 2023-2024			
<u>Retained Contents:</u> 1. Acid Industries: Manufacture. history. properties and uses or acetic acid, formic acid, benzoic acid, phthalic acid and oxalic acid. 2. Sugar and Fermentation Industries: introduction, culture development, inoculums preparation. nutrients for microorganisms, toxic effects on culture, Manufacture, properties and uses of Industrial alcohol, absolute alcohol, butyl alcohol, glycerol, ethylene glycol and propylene glycol. 3. Fertilizer Industry: Ammonia and Urea 4. Pulp and Paper Industry: 5. Cement Industry: <u>New Contents</u> 1. Industrial sodium Compound: Manufacture, properties and uses industrial sodium compounds like sodium thiosulfate, sodium bromide, sodium sulfate and sodium sulfite etc. 2. Halogens and chlorinated Compounds: introduction, manufacture properties and uses of fluorine. bromine, iodine, chlorine, methyl chloride, dichloromethane, chloroform and carbon tetrachloride. 3. Electro-thermal Industries: Introduction, classification. and advantages of electric furnace. Manufacture of silicon carbide, calcium carbide, graphite, and carbon electrodes.			
Weekly plan/ Reference Books			
1	Acid Industries: Manufacture. history. properties and uses or acetic acid, formic acid, benzoic acid, phthalic acid and oxalic acid.		
2-3	Sugar and Fermentation Industries: introduction, culture development, inoculums preparation. nutrients for microorganism, toxic effects on culture, Manufacture, properties and uses of Industrial alcohol, absolute alcohol, butyl alcohol, glycerol, ethylene glycol and propylene glycol.		
4	Fertilizer Industry: Ammonia and Urea		
5	Pulp and Paper Industry:		
6	Cement Industry:		
7-8	Industrial sodium Compound: Manufacture, properties and uses industrial sodium compounds like sodium thiosulfate, sodium bromide, sodium sulfate		

	and sodium sulfite etc.
9-10	Halogens and chlorinated Compounds: introduction, manufacture properties and uses of fluorine. bromine, iodine, chlorine, methyl chloride, dichloromethane, chloroform and carbon tetrachloride.
11-12	Electro-thermal Industries: Introduction, classification. and advantages of electric furnace. Manufacture of silicon carbide, calcium carbide, graphite, and carbon electrodes
13	Heavy Chemicals: Sulfuric Acid, Nitric Acid Water conditioning Soap and Detergents; Leather processing and tanning
14	Refractories; Types, properties, manufacture and major uses Industrial gases; Carbon dioxide, Hydrogen, Nitrogen
15-16	Chemical and fuels from Biomass Food processing industry; food processing techniques, food by products.
17	Revision
18	End Semester Exam

TEXT AND REFERENCE BOOKS:

- Austin George T. "Shreve's Chemical Processes Industries" 6th Ed. 1997, McGraw-Hill International Edition.
- Haidari Iqbal "Chemical Industry in Pakistan", 1992. Industrial Research Service Karachi, Pakistan.
- Pandey G. N. "A Textbook of Chemical Technology" 2nd Ed. Vol-I & II. 2000. Vikas Publishing House (Pvt) Limited
- Riegels Handbook of Industrial Chemistry, James A. Kent 2000, Springer/Van Nostrand/Reinhold.
- Kirk Othmer "Encyclopedia of Chemical Technology" 1999, Inter Science Publishers.
- Jacob A. Moulin, Michiel Makkee, Annelies E. van Diepen, "Chemical Process Technology, 2nd Edition, 2013, Wiley.
- Anne E. Marteel-Parrish and Martin A. Abraham, "Green Chemistry and Engineering: A pathway to Sustainability", 2014, Wiley.
- Bailey's Industrial Oil and Fat Products, 6 Volume Set, 6th Edition. Fereidoon Shahidi (Editor), 2005, John Wiley & Sons, Inc. Chopy & Hicks, "Handbook of Chemical Engineering Calculations", 2nd Ed. 1994 McGraw-Hill Professional Publishing.