

## CH304 CHEMICAL TECHNOLOGY-I

L	T	P	Cr
3	0	0	3.0

**Introduction to Chemical Engineering:** Unit operations and unit processes, functions of a chemical engineer in chemical and bio-chemical process industries. Study of the following chemical industries/processes involving process details, production trends, material and energy balances, flow sheets, engineering problems pertaining to materials of construction, waste regeneration/recycling, environmental and energy conservation measures.

**Industrial and Fuel Gases:** Oxygen, nitrogen, hydrogen, carbon dioxide, natural gas, LPG, producer gas, water gas, carbureted water gas, coke oven gas, synthesis gas.

**Nitrogen Industries:** Ammonia, nitric acid, ammonium sulphate, ammonium nitrate, urea, calcium ammonium nitrate.

**Phosphorus Industries:** Phosphorus, phosphoric acid, phosphatic fertilizers.

**Mixed Fertilizer:** N.P.K. fertilizers, diammonium hydrogen phosphate.

**Chlor-Alkali Industries:** Brine electrolysis, manufacture of caustic soda and chlorine in mercury cells, diaphragm cells, membrane cells, hydrochloric acid. Soda ash.

**Sulphur Industries:** Sulphur dioxide, sulphuric acid, oleum.

**Ceramic Industries:** Portland cement, Other Cement, Lime, Gypsum.

**Glass Industries:** Methods of manufacture of glass and special glasses.

**Explosives, Propellants, and Toxic Chemical Agents:** Types and characteristics of explosives, industrial explosives, propellants, rockets and Missiles, propellants for rockets.

**Metallurgical Industries:** Iron and steel.

### **Cryogenics in chemical industries**

#### **Course Learning Outcomes (CLO)**

The students will be able to:

1. understand the processes involved in the manufacturing of various inorganic chemicals.
2. prepare the process flow diagrams.
3. analyze important process parameters and engineering problems during production.

#### **Text Books**

1. Rao, M.G. and Sittig, M., *Dryden's Outlines of Chemical Technology-for the 21<sup>st</sup> century*, Affiliated East West Press (1998) 3<sup>rd</sup> ed.
2. Austin, G.T., *Shreve's Chemical Process Industries*, McGraw Hill (1998) 5<sup>th</sup> ed.

### **Reference Book**

1. Faith, W.L., Keyes, D.B. and Clark, R.L, *Industrial Chemicals*, John Wiley (1980) 4<sup>th</sup> ed.

### **Evaluation Scheme:**

<b>S. No.</b>	<b>Evaluation Elements</b>	<b>Weightage (%)</b>
1	MST	30
2	EST	50
3	Sessional (may include assignments/ quizzes)	20