

UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA



LESSON PLAN

SUBJECT-CHEMICAL PROCESS INDUSTRY-I

**PREPARED BY- SOVAN SAHOO
DEPARTMENT OF CHEMICAL
ENGINEERING**

	Topics covered
WEEK 1	Concept of Unit operation with examples
	Concept of Unit process with examples
	General principles applied in studying an industry
	Types of flow sheets
WEEK 2	Economics in Chemical process
	Choice of process technology
	Batch Process and examples
WEEK 3	Continuous process and examples
	Manufacturing process of Hydrogen from propane with a flow sheet
	Manufacturing of producer gas with flow-sheet
WEEK 4	Manufacturing of water gas with flow-sheet
	Manufacturing of Ammonia commercially
	Manufacturing of carbon dioxide
	Flow-sheet of manufacturing of Acetylene
WEEK 5	Process description of manufacturing of Acetylene
	Flow sheet of manufacturing of sulfuric acid by contact (DCDA) process
	Process description of manufacturing of sulfuric acid by contact (DCDA) process
	Flow sheet of manufacturing of Nitric acid by Ammonia Oxidation
WEEK 6	Process Description of manufacturing of Nitric acid by Ammonia Oxidation
	Flow sheet of manufacturing of Nitric acid by Ostwald's process
	Process Description of manufacturing of Nitric acid by Ostwald's process
	Revision and Quiz
WEEK 7	Chemical reaction and mechanism of manufacturing of soda ash by Solvay's process
	Flow sheet of manufacturing of soda ash by Solvay's process

	Process description of manufacturing of soda ash by Solvay's process
WEEK 8	Flow-sheet of manufacturing of caustic soda by electrolysis of brine
	Process description of manufacturing of caustic soda by electrolysis of brine
	Definition and types of electrolytic cells
WEEK 9	Advantages and disadvantages of electrolytic cells
	Manufacture of pulp by sulphate process
	Manufacture of pulp by sulphite process
WEEK 10	Manufacture of paper by wet process
	Recovery of chemicals from black liquor, by product utilization
	Different type of paper products
WEEK 11	Additives used in paper production and their application
	Different types of cement
	Constituents of cement and their characteristics, lime stone beneficiation
WEEK 12	Manufacture of portland cement by wet & dry process
	Additives used in cement industries, Factors affecting cement industry
	Importance of mini cement plant
	Methods of manufacturing cast iron
WEEK 13	Properties of cast iron
	Manufacturing of sponge iron with flow-sheet
	Manufacturing of wrought iron with flow-sheet
WEEK 14	Different methods of steel manufacturing
	Flow sheet for Manufacturing of alumina from bauxite by Bayer's process
	Process description of Manufacturing of alumina
	Extraction of aluminum from alumina by Hope's process
WEEK 15	Manufacturing of rare earth elements titanium and thorium and their application
	Manufacture of rare earth elements uranium & Zirconium and their application.
	Classification of fertilizers
	Manufacturing of urea with flow sheet
WEEK 16	Manufacturing of calcium ammonium nitrate with flow sheet
	Manufacturing of super phosphate with flow sheet
	Manufacturing of ammonium phosphate with flow sheet
	Manufacturing of nitrophosphate with flow sheet
WEEK 17	Manufacturing of sodium phosphate with flow sheet
	Mixed fertilizer
	Additives used in fertilizers
	Revision and Quiz

BOOKS FOR REFERENCE:

- Chemical Technology by C Dryden, Tata Mc Grawhill Publication
- Chemical Process Industries by N Shreeve, Tata Mc Grawhill Publication

	Prepared by	Approved by
Signature		
Name	SOVAN SAHOO	SOVAN SAHOO
Designation	Lecturer	HOD, Chemical.
SESSION	2023-24	

