

UTKALMANIGOPABANDHUINSTITUTE OF ENGINEERING, ROURKELA



DEPARTMENT OF CHEMICAL ENGINEERING

LESSON PLAN

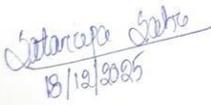
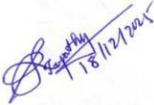
SUBJECT	PLANT UTILITIES
SUBJECT CODE	CHEPE202
SEMESTER	4TH
SESSION	2025-2026 Semester (22.12.2025-18.04.2026)
NAME OF FACULTY	SATARUPASAHU

WEEK	TOPIC TO BE COVERED
WEEK 1	Sources and storage of water in industry
	Quality parameters like Hardness (Hard & Soft water)
	Degree of hardness
WEEK 2	Turbidity, Suspended solids, Alkalinity
	Requisites of Industrial Water and its uses
	Methods of water treatment: Screening, Coagulation
WEEK 3	Sedimentation, Filtration, Sterilisation
	Softening (Lime Soda process)
	Softening (Reverse osmosis)
WEEK 4	Softening (Zeolite)
	Demineralisation (Ion Exchange Process)
	Water for boiler use
WEEK 5	Properties of Steam (Enthalpy, Wet steam)
	Defination (Saturated steam, Superheated steam, Specific volume of steam)
	Properties of Steam (Saturated steam, Superheated steam, Specific volume of steam)
WEEK 6	Types of steam (HP steam, MP steam, LP steam)
	Properties and applications (HP steam, MP steam, LP steam)
	Steam distribution
WEEK 7	Condensate utilization
	Components associated with a boiler
	Accessories associated with a boiler
WEEK 8	Comparison between Water Tube Boiler and Fire Tube Boiler;
	Boiler operation troubleshooting
	Working principle of refrigeration
WEEK 9	Refrigeration Cycle components
	Compressor, Condenser
	Expansion device
WEEK 10	Evaporator
	Different types of Refrigerants (Primary and Secondary)
	Selection of refrigerants

WEEK11	Definition and applications of utility air
	Utility air (Compressed air, Blower air)
	Fan air, Instrumental air
WEEK12	Classification of compressors
	Industrial applications of compressors
	Importance of vacuum pump;
WEEK13	Properties and uses of inert gases in industry;
	Drying unit and regeneration of drying unit
	Types of Fuel used in Chemical Process Industries
WEEK14	Power Generation using Natural Gas
	Power Generation using Liquid Petroleum Fuels
	Power Generation using Coal and Coke
WEEK15	Internal Combustion Engine
	Petrol and Diesel Engine
	Waste Disposal

BOOKS FOR REFERENCE:

1. V.Raghavan, "Materials Science and Engineering - A First Course", Prentice Hall of India Pvt. Ltd.
2. R. Balasubramaniam, "Callister's Materials Science and Engineering", Wiley

	Prepared by	Approved by
Signature	 18/12/2025	 18/12/2025
Name	Satarupa Sahu	ERRAJESH TRIPATHY
Designation	Lecturer STAGE-I	HOD, Chemical.
SESSION	2025-2026 (Semester from Date: 22.12.2025 to Date: 18.04.2026)	