UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA

LESSON PLAN

SESSION-2025-26

SEMESTER-FIFTH

SUBJECT: REFRIGERATION AND AIR CONDITIONING (THEORY- 05)

DEPARTMENT OF

MECHANICAL ENGINEERING

Discipline: Mechanical Engineering	Semester: 5th	Name of the Teaching Faculty: Er SISIR KUMAR DALAI, Sr. Lect. Mech.
Subject: Refrigeration and Air Conditioning (Th-5)	No of Days/Week Class Allotted: 04	Semester starts From Date: 14.07.2025 to Date: 15.11.2025 No of Week: 15
Week	**Class/Day**	**Theory/Practical Topics**
1st	1st	Air Refrigeration Cycle. Definition of refrigeration and unit of refrigeration
	2nd	Definition of COP, Refrigerating effect (R.E)
	3rd	Principle of working of open and closed air system of refrigeration.
	4th	*Calculation of COP of Bell-Coleman cycle and numerical on it*
2nd	1st	*Calculation of COP of Bell-Coleman cycle and numerical on it*
	2nd	Simple Vapour Compression Refrigeration System, schematic diagram of simple vapors
	3rd	Cycle with dry saturated vapors after compression.
	4th	Cycle with wet vapors after compression
3rd	1st	Cycle with superheated vapors after compression
	2nd	Cycle with superheated vapors before compression
	3rd	Cycle with sub cooling of refrigerant
	4th	Representation of above cycle on temperature entropy and pressure enthalpy
4th	1st	Representation of above cycle on temperature entropy and pressure enthalpy
	2nd	*Numerical on above (determination of COP,mass flow*
	3rd	*Numerical on above (determination of COP,mass flow*
	4th	Vapour Absorption Refrigeration System, Simple vapor absorption refrigeration system
5th	1st	Practical vapor absorption refrigeration system
	2nd	Practical vapor absorption refrigeration system
	3rd	COP of an ideal vapor absorption refrigeration system
	4th	COP of an ideal vapor absorption refrigeration system
6th	1st	*Numerical on COP*
	2nd	*Numerical on COP*
	3rd	Types of evaporator.
	4th	Refrigeration Equipments, Principle of working and constructional details of reciprocating and rotary
7th	1st	Centrifugal compressor only theory
	2nd	Important terms. Hermetically and semi hermetically sealed compressor.
	3rd	Condensers, Principle of working and constructional details of air cooled and water cooled condenser
	4th	Heat rejection ratio, Cooling tower and spray pond.

8th	1st	Evaporators, Principle of working and constructional details of an evaporator.
	2nd	Bare tube coil evaporator, finned evaporator, shell and tube evaporator
	3rd	Expansion Valves, Capillary tube
	4th	Automatic expansion valve, Thermostatic expansion valve
9th	1st	Refrigerants, Classification of refrigerants
	2nd	Desirable properties of an ideal refrigerant.
	3rd	Designation of refrigerant.
	4th	Thermodynamic Properties of Refrigerants.
10th	1st	Chemical properties of refrigerants.
	2nd	commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717, Substitute for CFC
	3rd	Applications of refrigeration, cold storage, dairy refrigeration
	4th	ice plant, water cooler
11th	1st	frost free refrigerator
	2nd	Psychometric terms, Adiabatic saturation of air by evaporation of w
	3rd	Psychometric chart and uses
	4th	Sensible heating and Cooling
12th	1st	Cooling and Dehumidification
	2nd	Heating and Humidification
	3rd	Adiabatic cooling with humidification
	4th	Total heating of a cooling process
13th	1st	SHF, BPF
	2nd	Adiabatic mixing
	3rd	*Problems on above*
	4th	Effective temperature and Comfort chart
14th	1st	Air Conditioning Systems
	2nd	Factors affecting comfort air conditioning. .
	3rd	Equipment used in an air-conditioning.
	4th	Classification of air-conditioning system
15th	1st	Winter Air Conditioning System
	2nd	Summer Air-conditioning system.
	3rd	*Numerical on above.*
	4th	*Numerical on above.*

11.07.2025

Er. Sisir Kumar Dalai

Sr. Lect. Mechanical.