GANAPATI INSTITUTE OF ENGINERING & TECHNOLOGY(Polytechnic),JAGATPUR,CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING.
LESSON PLAN-2025 WINTER

Discipline : MECHANICAL ENGG	**Semester : 5th**	**Name of the Teaching Faculty: PRAVAT KUMAR SWAIN**
Subject: R&AC(TH-5)	**No. of days/per week class allotted: 04**	**Semester From date: 14.07.2025** To Date: **15.11.2025** No. of Weeks: **15**
Week	**Class Day**	**Theory Topics**
1ST	1ST	1.**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	2.**SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM** • schematic diagram of simple vapors compression refrigeration system
	3RD	• Types • 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 enthalpydiagram
4TH	1ST	• Numerical on above (determination of COP, mass flow)
	2ND	• Numerical on above (determination of COP, mass flow)
	3RD	• Discussion of probable question
	4TH	3.**VAPOUR ABSORPTION REFRIGERATION SYSTEM** • Simple vapor absorption refrigeration system
5TH	1ST	• Practical vapor absorption refrigeration system
	2ND	• COP of an ideal vapor absorption refrigeration system
	3RD	• Numerical on COP.
	4TH	• Numerical on COP.
	1ST	• Numerical on COP.
	2ND	• CLASS TEST

6TH	3RD	**4. REFRIGERATION EQUIPMENTS** REFRIGERANT COMPRESSORS • Principle of working and constructional details of reciprocating and rotary compressors
	4TH	• Centrifugal compressor only theory Important terms
7TH	1ST	• Hermetically and semi hermetically sealed compressor.
	2ND	**CONDENSERS** • Principle of working and constructional details of air cooled and water cooled condenser
	3RD	• Heat rejection ratio. • Cooling tower and spray pond.
	4TH	**EVAPORATORS** • Principle of working and constructional details of an evaporator.
8TH	1ST	• Types of evaporator.
	2ND	• Bare tube coil evaporator, finned evaporator, shell and tube evaporator.
	3RD	**5. REFRIGERANT FLOW CONTROLS, REFRIGERANTS & APPLICATION OF RFRIGERANTS** • Expansion valves • Capillary tube • Automatic expansion valve • Thermostatic expansion valve
	4TH	**REFRIGERANTS** • Classification of refrigerants
9TH	1ST	• Desirable properties of an ideal refrigerant. Designation of refrigerant.
	2ND	• Thermodynamic Properties of Refrigerants. Chemical properties of refrigerants.
	3RD	• commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717
	4TH	• Substitute for CFC
10TH	1ST	• Applications of refrigeration cold storage
	2ND	• dairy refrigeration
	3RD	• ice plant • water cooler
	4TH	• frost free refrigerator
11TH	1ST	**6. PSYCHOMETRICS &COMFORT AIR CONDITIONING SYSTEMS** • Psychometric terms
	2ND	• Adiabatic saturation of air by evaporation of water Psychometric chart and uses.

	3RD	• Psychometric processes Sensible heating and Cooling
	4TH	• Cooling and Dehumidification Heating and Humidification
12TH	1ST	• Adiabatic cooling with humidification • Total heating of a cooling process
	2ND	• SHF, BPF,
	3RD	• Adiabatic mixing • Problems on above.
	4TH	• Effective temperature and Comfort chart
13TH	1ST	• Problems on above.
	2ND	• Discussion of probable question
	3RD	• CLASS TEST
	4TH	7.**AIR CONDITIONING SYSTEMS** • Factors affecting comfort air conditioning. . • Equipment used in an air-conditioning
14TH	1ST	• Classification of air-conditioning system
	2ND	• Winter Air Conditioning System
	3RD	• Summer air-conditioning system.
	4TH	• Numerical on above
15TH	1ST	• Numerical on above
	2ND	• Numerical on above
	3RD	• Discussion of probable question
	4TH	• CLASS TEST

Learning Resouces:

01. REFRIGERATION AND AIRCONDITIONING BY C.P ARRORA,TMH
02. REFRIGERATIONANDAIRCONDITIONINGBYR.S.KHURMI&J.K.GOPTA,S.CHAND
03. REFRIGERATION AND AIRCONDITIONING BY P.L BALLANY, KHANNAPUBLISHER
04. REFRIGERATION AND AIRCONDITIONINGBY DOMKUNDRA ANDARORA, DHANPAT RAYAND SON

Prepared By

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