GOVERNMENT POLYTECHNIC, NABARANGPUR

DEPARTMENT OF MECHANICAL ENGINEERING

Discipline: **MECHANICAL ENGG**	Semester: **5TH**	Name of the Teaching Faculty: Er. Mithun Kumar Keshari
Subject: **REFRIGERATION AND AIR CONDITIONING**	No. of days/per week class allotted: 04	Semester From date: 21.08.2024 To Date: 08.11.2024 No. of Weeks: 12

COURSE OUTCOMES

CO1. Explain the working of open & closed air system of air refrigeration system
CO2. Describe the working and construction of compressor, Condenser, evaporator, expansion valve used for air conditioning and refrigeration.
CO3. Explain Vapor Compression refrigeration system.
CO4. Explain Vapor Absorption refrigeration system.
CO5. Compare different refrigerants properties.
CO6. Describe equipment for air conditioning.
CO7. Explain the cooling load for the given requirement.

WEEK	CLASS DAY	THEORY TOPIC
1ST	1	**1. AIR REFRIGERATION CYCLE** Definition of refrigeration and unit of refrigeration
	2	Definition of COP, Refrigerating effect (R.E)
	3	Principle of working of open and closed air system of refrigeration.
	4	Calculation of COP of Bell-Coleman cycle Numerical on it
2ND	1	**2. SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM**
	2	Schematic diagram of simple vapors compression refrigeration system
	3	Types Cycle with dry saturated vapors after compression
	4	Cycle with wet vapors after compression
3RD	1	Cycle with superheated vapors before compression
	2	Cycle with sub cooling of refrigerant
	3	Representation of above cycle on temperature entropy and pressure enthalpy diagram
	4	Numerical on above (determination of COP, mass flow)
4TH	1	**3.VAPOUR ABSORPTION REFRIGERATION SYSTEM**
	2	Simple vapor absorption refrigeration system
	3	Simple vapor absorption refrigeration system
	4	Practical vapor absorption refrigeration system,
5TH	1	Numerical on COP
	2	**4. REFRIGERATION EQUIPMENTS** REFRIGERANT COMPRESSORS Principle of working and constructional details of reciprocating and rotary compressors
	3	Centrifugal compressor only theory Important terms.

	4	Hermetically and semi hermetically sealed compressor.
6TH	1	CONDENSERS Principle of working and constructional details of air cooled and water cooled condenser
	2	Heat rejection ratio Cooling tower and spray pond
	3	EVAPORATORS Principle of working and constructional details of an evaporator
	4	Types of evaporator Bare tube coil evaporator, finned evaporator, shell and tube evaporator
7TH	1	**5.REFRIGERANT FLOW CONTROLS, REFRIGERANTS & APPLICATION OF REFRIGERANTS** EXPANSION VALVES Capillary tube
	2	Automatic expansion valve Thermostatic expansion valve
	3	REFRIGERANTS Classification of refrigerants
	4	Desirable properties of an ideal refrigerant Designation of refrigerant
8TH	1	Thermodynamic Properties of Refrigerants Chemical properties of refrigerants
	2	Commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717 Applications of refrigeration Cold storage
	3	Dairy refrigeration Ice plant Water cooler Frost free refrigerator
	4	**6.PSYCHOMETRICS &COMFORT AIR CONDITIONING SYSTEMS** Psychometric terms
9TH	1	Adiabatic saturation of air by evaporation of water
	2	Psychometric chart and uses Psychometric processes
	3	.Sensible heating and Cooling Cooling and Dehumidification Heating and Humidification
	4	Adiabatic cooling with humidification
10TH	1	Total heating of a cooling process
	2	SHF, BPF Adiabatic mixing
	3	Problems on above
	4	Effective temperature and Comfort chart
11TH	1	**7. AIR CONDITIONING SYSTEMS** Introduction
	2	Factors affecting comfort air conditioning
	3	Equipment used in an air-conditioning
	4	Classification of air-conditioning system

12TH	1	Winter Air Conditioning System
	2	Summer air-conditioning system
	3	Numerical on above
	4	REVISION Class

LEARNING RESOURCES:

01. C.P Arrora Refrigeration And Air Conditioning Tmh
02. R.S.Khurmi &J.K.Gopta Refrigeration And Air Conditioning S.Chand
03. P.L Ballany Refrigeration And Air Conditioning Khanna Publisher
04. Domkundra And Arora Refrigeration And Air Conditioning Dhanpat Ray And Sons

21/08/2024

Sign. Of Faculty concerned

21/08/24

Academic coordinator

21/08/2024

Sign. Of HOD I/C

21.08.24

Principal, GP NABARANGPUR