

GOVERNMENT POLYTECHNIC, MALKANGIRI
DEPARTMENT OF MECHANICAL ENGINEERING

Discipline:- MECHANICAL ENGG.	Semester:- 5TH	Name of Teaching Faculty:- Sri SAURAV RANJAN PRADHAN, WORKSHOP SUPERINTENDENT	
SUB:-Th.5- Refrigeration and air- conditioning	No of Days /per week class allotted:-04	Semester From Date:-15.09.22 To Date:-21.01.23 No of Weeks-15	
PRE-REQUISITE	Basic knowledge about Thermal Engg.		
COURSE OUTCOMES	<p>CO1:- Explain the working of open and closed air system of air refrigeration system.</p> <p>CO2:- Describe working and construction of compressor, condenser, evaporator, expansion valve used for air conditioning and refrigeration .</p> <p>CO3:- Explain vapour compression refrigeration system.</p> <p>CO4:- Explain vapour absorption refrigeration system.</p> <p>CO5:- Compare different refrigerants properties.</p> <p>CO6:-Describe equipment for air conditioning.</p> <p>CO7:-Explain the cooling load for the given requirement.</p>		
WEEK	CLASS DAY	THEORY TOPICS	DELIVERY METHOD
1ST	1st	AIR REFRIGERATION CYCLE:- Definition of refrigeration and unit of refrigeration	Whiteboard
	2nd	Definition of COP, Refrigerating effect (R.E)	Whiteboard
	3rd	Principle of working of open and closed air system of refrigeration.	Whiteboard
	4th	Calculation of COP of Bell-Coleman cycle and numerical on it	PPT
2ND	1st	Chapter-1 :- Discussion & Assignment Questions	Whiteboard
	2nd	SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM: - Simple vapors compression refrigeration system, types	Whiteboard
	3rd	Cycle with dry saturated vapors after compression.	PPT
	4th	Related prolems	Whiteboard
3RD	1st	Cycle with wet vapors after compression.	PPT
	2nd	Related prolems	Whiteboard
	3rd	Cycle with superheated vapors after compression.	PPT
	4th	Related prolems	Whiteboard
	1st	Cycle with superheated vapors before compression, Related prolems	PPT

4TH	2nd	Cycle with sub cooling of refrigerant, Related problems	Whiteboard
	3rd	Chapter-2 :- Discussion & Assignment Questions	Whiteboard
	4th	VAPOUR ABSORPTION REFRIGERATION SYSTEM:- Simple vapor absorption refrigeration system	Whiteboard
5TH	1st	Simple vapor absorption refrigeration system	Whiteboard
	2nd	Practical vapor absorption refrigeration system	Whiteboard
	3rd	Practical vapor absorption refrigeration system	Lecture notes
	4th	COP of an ideal vapor absorption refrigeration system	Whiteboard
6TH	1st	Numerical on COP	Whiteboard
	2nd	Chapter-3 :- Discussion & Assignment Questions	Whiteboard
	3rd	REFRIGERANT COMPRESSORS:- Principle of working and constructional details of reciprocating and rotary compressors	Whiteboard
	4th	Centrifugal compressor, Important terms	PPT
7TH	1st	Hermetically and semi hermetically sealed compressor	Lecture notes
	2nd	CONDENSERS:- Principle of working and constructional details of air cooled and water cooled condenser	Whiteboard
	3rd	Heat rejection ratio, cooling tower and spray pond	Lecture notes
	4th	EVAPORATORS:- Principle of working and constructional details of an evaporator, types of evaporator	Whiteboard
8TH	1st	Bare tube coil evaporator, finned evaporator, shell and tube evaporator	Whiteboard
	2nd	Chapter-4 :- Discussion & Assignment Questions	Whiteboard
	3rd	EXPANSION VALVES:- Capillary tube, Automatic expansion valve, Thermostatic expansion valve	Lecture notes
	4th	REFRIGERANTS:- Classification of refrigerants	Whiteboard
9TH	1st	Desirable properties of an ideal refrigerant.	Whiteboard
	2nd	Designation of refrigerant.	Whiteboard
	3rd	Thermodynamic Properties of Refrigerants.	Whiteboard
	4th	Chemical properties of refrigerants.	Whiteboard
10TH	1st	commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717	Whiteboard
	2nd	Substitute for CFC	Whiteboard
	3rd	APPLICATIONS OF REFRIGERATION:- cold storage, dairy refrigeration, ice plant, water cooler, frost free refrigerator	PPT
	4th	Chapter- 5 :- Discussion & Assignment Questions	Whiteboard
11TH	1st	PSYCHOMETRICS & COMFORT AIR CONDITIONING SYSTEMS, Psychometric terms	Whiteboard
	2nd	Adiabatic saturation of air by evaporation of water	Whiteboard

	3rd	Psychometric chart and uses.	PPT
	4th	Sensible heating and Cooling, Cooling and Dehumidification	PPT
12TH	1st	Heating and Humidification, Adiabatic cooling with humidification	PPT
	2nd	Total heating of a cooling process, SHF, BPF,	Whiteboard
	3rd	Related prolems	Whiteboard
	4th	Related prolems	Whiteboard
13TH	1st	Effective temperature and Comfort chart	Whiteboard
	2nd	Chapter-6 :- Discussion & Assignment Questions	Whiteboard
	3rd	AIR CONDITIONING SYSTEMS ,factors affecting comfort air conditioning	Whiteboard
	4th	Equipment used in an air-conditioning	Whiteboard
1TH	1st	Classification of air-conditioning system	PPT
	2nd	Winter Air Conditioning System	Whiteboard
	3rd	Winter Air Conditioning System	Lecture notes
	4th	Summer air-conditioning system	Whiteboard
15TH	1st	Summer air-conditioning system	Lecture notes
	2nd	Related prolems	Whiteboard
	3rd	Related prolems	Whiteboard
	4th	Chapter- 7 :- Discussion & Assignment Questions	Whiteboard

LEARNING RESOURCES-

- 01:- REFRIGERATION AND AIR CONDITIONING, C.P ARRORA
02:-REFRIGERATION AND AIR CONDITIONING, R.S.KHURMI &J.K.GOPTA
03:- REFRIGERATION AND AIR CONDITIONING, P.L BALLANY
04:- REFRIGERATION AND AIR CONDITIONING, DOMKUNDRA AND ARORA

WEBSITE RESOURCES-

- 01:- www.youtube.com

Sign. of Faculty concerned

Sign. of HOD

Sign. of Academic Co-ordinator

PRINCIPAL
Govt. Polytechnic, Malkangiri