

KIIT POLYTECHNIC
Department of Mechanical Engineering

LESSON PLAN

Session	::	Winter – 2022
Course Type	::	Theory
Semester/Branch	::	5 th Semester, Mechanical Engineering
Subject (with code)	::	REFRIGERATION AND AIR CONDITIONING (Th.5)
Contact hours/week	::	4
Name of Faculty	::	Durga Sankar Panda

SL. NO	CLAS S ID	COURSE CONTENT	MODE OF DELIVERY	EXHIBIT/ REFERENCE
1	1	Concept of refrigeration and unit of refrigeration.	Lecture (Model)	1. Study Material 2. Refrigeration and air conditioning by C. P. Arora (Book)
2	2	Definition of COP, Refrigerating effect (R.E)	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by C. P. Arora (Book)
3	3	Principle of working of open and closed air system of refrigeration.	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by C. P. Arora (Book)
4	4	Calculation of COP of Bell-Coleman cycle and Problem Solving.	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)
5	5	Schematic diagram of simple vapors compression refrigeration system	Hybrid	https://www.youtube.com/watch?v=gPOO7FUHw88
6	6	Cycle with dry saturated vapors after compression	Hybrid	https://www.youtube.com/watch?v=sM0Pld_CpTc
7	7	Cycle with wet vapors after compression.	Hybrid	https://www.youtube.com/watch?v=cWopMScKEt8
8	8	Cycle with superheated vapors after compression.	Flipped class	
9	9	Cycle with superheated vapors before compression	Hybrid	https://www.youtube.com/watch?v=3XYSU4SKbLU
10	10	Cycle with sub cooling of refrigerant	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)

11	11	Representation of above cycle on temperature entropy and pressure enthalpy diagram. Problem solving (determination of COP, mass flow)	Lecture (Elaboration)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)
12	12	Class Test/Assignment		
13	13	Working principle of Simple vapor absorption refrigeration system	Video Content	https://www.youtube.com/watch?v=Ghp-O1bMMuU
14	14	Working principle of Practical vapor absorption refrigeration system	Hybrid	https://www.youtube.com/watch?v=Ghp-O1bMMuU
15	15	COP of an ideal vapor absorption refrigeration system Problem solving on COP	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by C. P. Arrora (Book)
16	16	Refrigerant compressors, Working Principle of working and constructional details of reciprocating and rotary compressors.	Lecture (Model)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)
17	17	Centrifugal compressor, Hermetically and semi hermetically sealed compressor.	Video Content	https://www.youtube.com/watch?v=tOvMfwlY-To
18	18	Principle of working and constructional details of air cooled and water cooled condenser. Heat rejection ratio. Cooling tower and spray pond	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)
19	19	Class Test/Assignment		
20	20	Principle of working and constructional details of an evaporator.	Lecture (Model)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)
21	21	Types of evaporator. Bare tube coil evaporator. Finned evaporator, shell and tube evaporator.	Prompt and Clue	
22	22	Function of expansion valves Working of Capillary tube	Video Content	https://www.youtube.com/watch?v=N41dAkYkmY4
23	23	Working principle of Automatic expansion valve	Video Content	https://www.youtube.com/watch?v=N41dAkYkmY4
24	24	Working principle of Thermostatic expansion valve	Hybrid	https://www.youtube.com/watch?v=wSxxakDnH9M
25	25	Classification of refrigerants	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by C. P. Arrora (Book)
26	26	Desirable properties of an ideal refrigerant.	Lecture (Elaboration)	1. Study Material 2. Refrigeration and air conditioning by C. P. Arrora (Book)

27	27	Designation of refrigerant.	Video Content	https://www.youtube.com/watch?v=6_ePn_LkIQM
28	28	Thermodynamic Properties of Refrigerants.	Video Content	https://www.youtube.com/watch?v=6_ePn_LkIQM
29	29	Chemical properties of refrigerants.	Video Content	
30	30	Commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)
31	31	Applications of refrigeration		
32	32	Class Test/Assignment		
33	33	Working details of cold storage	Field Visit	
34	34	Substitute for CFC	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by C. P. Arrora (Book)
35	35	Ice plant and dairy refrigeration	Flipped class	
36	36	Working principle of water cooler	Demonstration	1. Study Material 2. Refrigeration and air conditioning by C. P. Arrora (Book)
37	37	Discussion about frost free refrigerator.	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by C. P. Arrora (Book)
38	38	Psychrometric terms	Guest Lecture	
39	39	Adiabatic saturation of air by evaporation of water.	Lecture (Elaboration)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)
40	40	Class Test/Assignment		
41	41	Psychrometric chart and uses. Psychrometric processes	Video Content	https://www.youtube.com/watch?v=_U1PBYkuSVk
42	42	Sensible heating and Cooling	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)
43	43	Cooling and Dehumidification Heating and Humidification	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)
44	44	Adiabatic cooling with humidification, Total heating of a cooling process SHF, BPF,		
45	45	Adiabatic mixing, Problem solving.	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)

46	46	Effective temperature and Comfort chart. Factors affecting comfort air conditioning. Equipment used in an air-conditioning.	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)
47	47	Classification of air-conditioning system, Winter Air Conditioning System	Problem Based Learning	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)
48	48	Summer air-conditioning system. Numerical on above	Lecture (Explanation)	1. Study Material 2. Refrigeration and air conditioning by R.S.Khurmi & J. K. Gupta (Book)

Signature of Concern Teacher