Orissa School of Mining Engineering
Keonjhar

Department of Mechanical Engineering

Lesson Plan w.e.f 01.10.2021 – 18.01.2022

Subject: **REFRIGERATION AND AIR CONDITIONING (TH-5)**			
Discipline: **Mechanical Engineering**		Name of the Faculty: **Bibhabaree Samal**	
Course Code:	**TH-5**	Semester:	**5th**
Total Periods:	**60**	Examination:	**2021(Winter)**
Theory Periods:	4P/W	Class Test:	20
Maximum Marks:	**100**	End Semester Examination:	80

Week	Class Day	Theory Topics
1st	1st	Chapter 1-**Air refrigeration cycle**,Definition of refrigeration,unit of refrigeration
	2nd	COP,Refrigeration effect
	3rd	Open and closed air refrigeration cycle.Air refrigeration working on reversed Carnot cycle
	4th	COP of Bell Coleman cycle
2nd	1st	Numericals on COP calculation
	2nd	Q/A discussion,Assignment 1
	3rd	Chapter 2-**Vapour Compression Refrigeration System.** Mechanism of simple VC Refrigeration system,Types
	4th	Cycle with dry saturated vapour after compression with P-V and T-S diagram
3rd	1st	Cycle with wet vapour after compression with P-V and T-S diagram
	2nd	Cycle with super heated vapour after compression with P-V and T-S diagram
	3rd	Cycle with super heated vapour before compression with P-V and T-S diagram
	4th	Cycle with sub cooling of refrigerant with P-V and T-S diagram
4th	1st	Numericals
	2nd	Numericals
	3rd	Numericals
	4th	Numericals
5th	1st	Q/A discussion,Assignment 2
	2nd	Chapter 3-**Simple Vapour Absorption Refrigeration System mechanism**
	3rd	Practical VA refrigeration system
	4th	Advantages and disadvantages of VA system over VC system COP of ideal VA system
6th	1st	Numericals on COP calculation
	2nd	Q/A discussion,Assignment 3

	3rd	Chapter 4 -**Refrigeration Equipments** classifications of refrigerant Compressors, Important terms
	4th	Working of Reciprocating compressor
7th	1st	Working of Rotary compressor
	2nd	Working of centrifugal compressor,Hermatically and semi hermatically sealed compressor
	3rd	Air cooled condenser,water cooled condenser
	4th	Heat rejection ratio
8th	1st	Cooling tower,spray pond
	2nd	Working and constructional details of an evaporator
	3rd	Bare tube coil evaporator,finned evaporator,shell and tube evaporator
	4th	Q/A discussion,Assignment 4
9th	1st	Chapter 5-**Refrigerant Flow controls,Refrigerants** Functions of Expansion device,Capillary tube
	2nd	Automatic Expansion valve,Thermostatic Expansion valve
	3rd	Classification of refrigerants,designation of refrigerants
	4th	Desirable properties of an ideal refrigerant
10th	1st	Thermal and chemical properties of refrigerants
	2nd	Commonly used refrigerants R-11,R-12,R-22,R-134a,R-717 Substitute for CFC
	3rd	Application of refrigerant,cold storage,dairy refrigeration,ice plant,water cooler,frost free refrigerator
	4th	Q/A discussion,Assignment 5
11th	1st	Chapter 6-**Psychrometrics and Comfort air conditioning**. Psychrometric terms
	2nd	Adiabatic saturation of air by evaporation
	3rd	Psychrometric chart and use
	4th	Sensible heating and sensible cooling
12th	1st	Heating and Humidification
	2nd	Adiabatic cooling with humidification
	3rd	SHF,BPH
	4th	Adiabatic mixing
13th	1st	Numericals
	2nd	Numericals
	3rd	Numericals
	4th	Numericals
14th	1st	Effective temperature anf Comfort chart
	2nd	Chapter 7-**Air Conditioning System** Equipments used in air conditioning system,classification
	3rd	Winter air conditioning System
	4th	Summer air conditioning System
15th	1st	Numericals
	2nd	Numericals
	3rd	Revision
	4th	Revision