

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK  
DEPARTMENT OF MECHANICAL ENGINEERING



LESSON PLAN

SUBJECT: REFRIGERATION AND AIR CONDITIONING(TH-5)  
FACULTY: MRS SUNITA SAMAL

ACCADEMIC SESSION: 2024-25(W)  
SEMESTER: 5<sup>TH</sup>  
SEC: B

H O D (Mech.Engg.)

  
Sd/-

**BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK**  
**DEPARTMENT OF MECHANICAL ENGINEERING**  
**LESSON PLAN**

DISCIPLINE: MECHANICAL ENGINEERING		SEMESTER: 5 <sup>TH</sup> (B)		NAME OF THE TEACHING FACULTY: MRS SUNITA SAMAL	
SUBJECT : REFRIGERATION AND AIR CONDITIONING(TH-5)		NO. OF DAYS/ PER WEEK CLASS ALLOTTED: 04 PERIODS PER WEEK (Mon-1 period , Tues-1 period, Thu-1 period, Fri-1 period)		SEMESTER FROM DATE: 01-07-2024 TO DATE: 08-11-2024 NO. OF WEEKS: 19WEEKS	
WEEK	CLASS DAY	NO OF PERIODS AVAILABLE	THEORY TOPICS		
1 <sup>ST</sup> (4)	01/07/24	1	<b>INTRODUCTION ON REFRIGERATION AND AIR CONDITIONING</b>		
	02/07/24	1			
	04/07/24	1			
	05/07/24	1			
2 <sup>ND</sup> (4)	08/07/24	1	<b>1.0 AIR REFRIGERATION CYCLE.</b> 1.1 Definition of refrigeration and unit of refrigeration 1.2 Definition of COP, Refrigerating effect (R.E ) 1.3 Principle of working of open and closed air system of refrigeration. 1.3 Principle of working of open and closed air system of refrigeration. 1.3 Calculation of COP of Bell-Coleman cycle and numerical on it. <b>2.0 SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM</b> 2.1 schematic diagram of simple vapors compression refrigeration system' 2.1 schematic diagram of simple vapors compression refrigeration system' 2.2.1 Cycle with dry saturated vapors after compression. 2.2.2 Cycle with wet vapors after compression.. 2.2.3 Cycle with superheated vapors after compression. 2.2.4 Cycle with superheated vapors before compression.		
	09/07/24	1			
	11/07/24	1			
	12/07/24	1			
	15/07/24	1			
	16/07/24	1			
	18/07/24	1			
	19/07/24	1			
3 <sup>RD</sup> (4)					

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4 <sup>TH</sup> (4)	22/07/24	1	2.2.5 Cycle with sub cooling of refrigerant
	23/07/24	1	2.2.6 Representation of above cycle on temperature entropy and pressure enthalpy diagram
	25/07/24	1	2.2.7 Numerical on above (determination of COP, mass flow)
	26/07/24	1	2.2.7 Numerical on above (determination of COP, mass flow)
5 <sup>TH</sup> (4)	29/07/24	1	2.2.7 Numerical on above (determination of COP, mass flow)
	30/07/24	1	<b>3.0 VAPOUR ABSORPTION REFRIGERATION SYSTEM</b>
	01/08/24	1	3.1 Simple vapour absorption refrigeration system
	02/08/24	1	3.2 Practical vapour absorption refrigeration system
	05/08/24	1	3.3 COP of an ideal vapour absorption refrigeration system .
	06/08/24	1	3.4 Numerical on COP
6 <sup>TH</sup> (4)	08/08/24	1	<b>CLASS TEST-1</b>
	09/08/24	1	<b>4.0 REFRIGERATION EQUIPMENTS</b>
			<b>4.1 REFRIGERANT COMPRESSORS</b>
			4.1.1 Principle of working and constructional details of reciprocating and rotary compressors.
7 <sup>TH</sup> (3)	12/08/24	1	4.1.1 Principle of working and constructional details of reciprocating and rotary compressors.
	13/08/24	1	4.1.2 Centrifugal compressor only theory
	16/08/24	1	4.1.3 Important terms.
			4.1.4 Hermetically and semi hermetically sealed compressor.
8 <sup>TH</sup> (3)	20/08/24	1	<b>4.2 CONDENSERS</b>
	22/08/24	1	4.2.1 Principle of working and constructional details of air cooled and water cooled condenser
			4.2.2 Heat rejection ratio.
			4.2.3 Cooling tower and spray pond.
	23/08/24	1	<b>4.3 EVAPORATORS</b>
			1.6.1 Principle of working and constructional details of an evaporator.

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9 <sup>TH</sup> (3)	27/08/24	1	1.6.2 Types of evaporator.
	29/08/24	1	1.6.3 Bare tube coil evaporator, finned evaporator, shell and tube evaporator..
10 <sup>TH</sup> (4)	30/08/24	1	1.6.3 Bare tube coil evaporator, finned evaporator, shell and tube evaporator. 4.2.2 Pressure regulation valves
	02/09/24	1	<b>5.0 REFRIGERANT FLOW CONTROLS, REFRIGERANTS &amp; APPLICATION OF REFRIGERANTS</b>
			<b>5.1 EXPANSION VALVES</b>
			5.1.1 Capillary tube
			5.1.2 Automatic expansion valve
11 <sup>TH</sup> (4)	03/09/24	1	5.1.3 Thermostatic expansion valve
	05/09/24	1	<b>5.2 REFRIGERANTS</b>
	06/09/24	1	5.2.1 Classification of refrigerants
	09/09/24	1	5.2.2 Desirable properties of an ideal refrigerant.
			5.2.3 Designation of refrigerant.
			<b>INTERNAL ASSESSMENT-1</b>
			5.2.4 Thermodynamic Properties of Refrigerants.
12 <sup>TH</sup> (4)	12/09/24	1	5.2.5 Chemical properties of refrigerants.
	13/09/24	1	5.2.6 commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717
	17/09/24	1	5.2.7 Substitute for CFC 4.5
	19/09/24	1	5.3 Applications of refrigeration
13 <sup>TH</sup> (4)			5.3.1 cold storage
			5.3.2 dairy refrigeration
	20/09/24	1	5.3.3 ice plant
	23/09/24	1	5.3.4 water cooler
			5.3.5 frost free refrigerator
			<b>6.0 PSYCHOMETRICS &amp; COMFORT AIR CONDITIONING SYSTEMS</b>
	24/09/24	1	6.1 Psychometric terms 6.2 Adiabatic saturation of air by evaporation of water

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	26/09/24	1	6.3 Psychometric chart and uses.
	27/09/24	1	6.4 Psychometric processes 6.4.1 Sensible heating and Cooling
	30/9/24	1	6.4.2 Cooling and Dehumidification 6.4.3 Heating and Humidification
14 <sup>TH</sup> (4)	01/10/24	1	6.4.4 Adiabatic cooling with humidification 6.4.5 Total heating of a cooling process
	03/10/24		6.4.6 SHF, BPF, 6.4.7 Adiabatic mixing
	04/10/24	1	6.4.8 Problems on above.
			<b>PUSA VACATION</b>
15 <sup>TH</sup>	14/10/24	1	6.5 Effective temperature and Comfort chart
	15/10/24	1	<b>7.0 AIR CONDITIONING SYSTEMS</b>
	17/10/24	1	7.1 Factors affecting comfort air conditioning. 7.2 Equipment used in air-conditioning.
	18/10/24	1	7.3 Classification of air-conditioning system 7.4 Winter Air Conditioning System
16 <sup>TH</sup> (4)	21/10/24	1	7.5 Summer air-conditioning system.
	22/10/24	1	7.6 Numerical on above
	24/10/24	1	7.6 Numerical on above
	25/10/24	1	7.6 Numerical on above
17 <sup>TH</sup> (4)	28/10/24	1	DOUBT CLEARING CLASS
	29/10/24	1	DOUBT CLEARING CLASS
	01/11/24	1	DOUBT CLEARING CLASS
	04/11/24	1	<b>CLASS TEST-II</b>
18 <sup>TH</sup> (3)	05/11/24	1	Revision
	07/11/24	1	Previous year question discussion
	08/11/24	1	Previous year question discussion
19 <sup>TH</sup> (4)			

