NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: Th-5 (RAFRIGERATION AND AIR CONDITIONIG)

Name Of The Faculty :- Er. Manoranjan Behera **Session :- 2025-26**
Branch :- Mechanical Engineering **Semester :- 5th**

Examination :- 2025 (W)

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	AIR REFRIGIERATION CYCLE	5	5
2	SIMLE VAPOUR COMPRESSION REFRIGERATION SYSTEM	10	10
3	VAPOUR ABSORPTION REFRIGERATION SYSTEM	7	6
4	REFRIGERATRION EQUIPMENTS	8	11
5	REFRIGERATRION FLOW CONTROLS, REFRIGERANTS & APPLICATION OF REFRIGERANTS	10	9
6	PSYCHOMETRICS & COMFORT AIR CONDITIONING SYSTEM	10	10
7	AIR CONDITIONING SYSTEM	10	9
	Total Period:	60	60

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Name of the programme: Diploma in Mechanical Engineering	Semester: 5th	**Name of the Teaching Faculty:** Er. Manoranjan Behera	
		Academic Year : 2025-26 **Examination :** 2025 (W)	
Course Code: TH-5	**Course Year:** Third Year	**No. of Classes Alloted Per Week :**	4
		Planned Classes Required to Complete the Course	60

Week	Class Day	Topics to be Covered
1st	1st	1.0 AIR REFRIGERATION CYCLE, Definition of refrigeration and unit of refrigeration
	2nd	. Definition of COP, Refrigerating effect (R.E)
	3rd	1.3 Principle of working of open and closed air system of refrigeration
	4th	1.3.1 Calculation of COP of Bell-Coleman cycle and numerical on it.
2nd	1st	1.3.1 Calculation of COP of Bell-Coleman cycle and numerical on it.
	2nd	2.0 SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM
	3rd	2.1 schematic diagram of simple vapors compression refrigeration system
	4th	2.2 Types 2.2.1 Cycle with dry saturated vapors after compression
3rd	1st	2.2.2 Cycle with wet vapors after compression.
	2nd	2.2.3 Cycle with superheated vapors after compression
	3rd	2.2.4 Cycle with superheated vapors before compression
	4th	2.2.5 Cycle with sub cooling of refrigerant
4th	1st	2.2.5 Cycle with sub cooling of refrigerant
	2nd	2.2.6 Representation of above cycle on temperature entropy and pressure enthalpy diagram
	3rd	2.2.7 Numerical on above (determination of COP,mass flow)
	4th	2.2.7 Numerical on above (determination of COP,mass flow)
5th	1st	VAPOUR ABSORPTION REFRIGERATION SYSTEM
	2nd	3.1 Simple vapor absorption refrigeration system
	3rd	3.1 Simple vapor absorption refrigeration system
	4th	3.2 Practical vapor absorption refrigeration system

Week	Class Day	Topics to be Covered
6th	1st	3.3 COP of an ideal vapor absorption refrigeration system
	2nd	3.4.Numerical on COP.
	3rd	3.4.Numerical on COP.
	4th	4.0 REFRIGERATION EQUIPMENTS
7th	1st	4.1.1 Principle of working and constructional details of reciprocating and rotary compressors.
	2nd	4.1.1 Principle of working and constructional details of reciprocating and rotary compressors.
	3rd	4.1.1 Principle of working and constructional details of reciprocating and rotary compressors.
	4th	4.1.2 Centrifugal compressor only theory
8th	1st	4.1.3 Important terms. 4.1.4 Hermetically and semi hermetically sealed compressor.
	2nd	4.2 CONDENSERS 4.2.1 Principle of working and constructional details of air cooled and water cooled condenser
	3rd	4.2 CONDENSERS 4.2.1 Principle of working and constructional details of air cooled and
	4th	4.2.2 Heat rejection ratio. 4.2.3 Cooling tower and spray pond.
9th	1st	4.3 EVAPORATORS 1.6.1 Principle of working and constructional details of an evaporator
	2nd	1.6.2 Types of evaporator. 1.6.3 Bare tube coil evaporator, finned evaporator, shell and tube evaporator.
	3rd	5.0 REFRIGERANT FLOW CONTROLS, REFRIGERANTS & APPLICATION OF REFRIGERANTS 5.1 EXPANSION VALVES
	4th	5.1.2 Automatic expansion valve 5.1.3 Thermostatic expansion valve
10th	1st	5.2 REFRIGERANTS 5.2.1 Classification of refrigerants 5.2.2 Desirable properties of an ideal refrigerant.
	2nd	5.2.3 Designation of refrigerant. 5.2.4 Thermodynamic Properties of Refrigerants
	3rd	5.2.5 Chemical properties of refrigerants. 5.2.6 commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717 5.2.7 Substitute for CFC
	4th	5.3 Applications of refrigeration 5.3.1 cold storage 5.3.2 dairy refrigeratio

Week	Class Day	Topics to be Covered
11th	1st	5.3.3 ice plant 5.3.4 water cooler
	2nd	6.0 PSYCHOMETRICS &COMFORT AIR CONDITIONING SYSTEMS 6.1 Psychometric terms
	3rd	6.2 Adiabatic saturation of air by evaporation of water 6.3 Psychometric chart and uses.
	4th	6.4 Psychometric processes 6.4.1 Sensible heating and Cooling 6.4.2 Cooling and Dehumidification 6.4.3 Heating and Humidification 6.4.4 Adiabatic cooling with humidification
12th	1st	6.4.5 Total heating of a cooling process 6.4.6 SHF, BPF
	2nd	6.4.7 Adiabatic mixing
	3rd	6.4.8 Problems on above
	4th	6.4.8 Problems on above
13th	1st	6.5 Effective temperature and Comfort chart
	2nd	7.0 AIR CONDITIONING SYSTEMS 7.1 Factors affecting comfort air conditioning.
	3rd	7.2 Equipment used in an air-conditioning
	4th	7.3 Classification of air-conditioning system
14th	1st	7.4 Winter Air Conditioning System
	2nd	7.4 Winter Air Conditioning System
	3rd	7.5 Summer air-conditioning system.
	4th	7.6 Numerical on above
15th	1st	7.6 Numerical on above
	2nd	7.6 Numerical on above
	3rd	Revision
	4th	Revision

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