



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



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LESSON PLAN

SUBJECT: TH-4 (REFRIGIERATION & AIR CONDITIONING)

CHAPTERWISE DISTRIBUTION OF PERIODS

SL NO.	TOPIC	No. of Periods as per the Syllabus	No. of periods actually needed
1	AIR REFRIGIERATION CYCLE	05	05
2	SIMLE VAPOUR COMPRESSION REFRIGERATION SYSTEM	10	10
3	VAPOUR ABSORPTION REFRIGERATION SYSTEM	07	06
4	REFRIGERATRION EQUIPMENTS	08	11
5	REFRIGERATRION FLOW CONTROLS, REFRIGERANTS & APPLICATION OF REFRIGERANTS	10	09
6	PSYCHOMETRICS & COMFORT AIR CONDITIONING SYSTEM	10	10
7	AIR CONDITIONING SYSTEM	10	09
TOTAL		60	60

Discipline: Mechanical Engg	Semester: 5th	Name of the Teaching Faculty: Er. Manoranjan Behera
<i>Week</i>	<i>Class Day</i>	<i>Theory / Practical Topics</i>
<i>1st</i>	<i>1st</i>	<i>1.0 AIR REFRIGERATION CYCLE, Definition of refrigeration and unit of refrigeration</i>
	<i>2nd</i>	<i>. Definition of COP, Refrigerating effect (R.E)</i>
	<i>3rd</i>	<i>1.3 Principle of working of open and closed air system of refrigeration</i>
	<i>4th</i>	<i>1.3.1 Calculation of COP of Bell-Coleman cycle and numerical on it.</i>
<i>2nd</i>	<i>1st</i>	<i>1.3.1 Calculation of COP of Bell-Coleman cycle and numerical on it.</i>
	<i>2nd</i>	<i>2.0 SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM</i>
	<i>3rd</i>	<i>2.1 schematic diagram of simple vapors compression refrigeration system'</i>
	<i>4th</i>	<i>2.2 Types 2.2.1 Cycle with dry saturated vapors after compression</i>

3 rd	1 st	2.2.2 Cycle with wet vapors after compression.
	2 nd	2.2.3 Cycle with superheated vapors after compression
	4 th	2.2.4 Cycle with superheated vapors before compression
4 th	1 st	2.2.5 Cycle with sub cooling of refrigerant
	2 nd	2.2.6 Representation of above cycle on temperature entropy and pressure enthalpy diagram
	3 rd	2.2.7 Numerical on above (determination of COP, mass flow)
	4 th	2.2.7 Numerical on above (determination of COP, mass flow)
5 th	1 st	VAPOUR ABSORPTION REFRIGERATION SYSTEM
	2 nd	3.1 Simple vapor absorption refrigeration system
	3 rd	3.1 Simple vapor absorption refrigeration system
	4 th	3.2 Practical vapor absorption refrigeration system
6 th	1 st	3.3 COP of an ideal vapor absorption refrigeration system
	2 nd	3.4. Numerical on COP.
	3 rd	3.4. Numerical on COP.
	4 th	4.0 REFRIGERATION EQUIPMENTS
7 th	1 st	4.1.1 Principle of working and constructional details of reciprocating and rotary compressors.
	2 nd	4.1.1 Principle of working and constructional details of reciprocating and rotary compressors.
	3 rd	4.1.1 Principle of working and constructional details of reciprocating and rotary compressors.
	4 th	4.1.2 Centrifugal compressor only theory
8 th	1 st	Important terms. Hermetically and semi hermetically sealed compressor.
	2 nd	CONDENSERS Principle of working and constructional details of air cooled and water cooled condenser
	3 rd	CONDENSERS Principle of working and constructional details of air cooled and water cooled condenser
	4 th	Heat rejection ratio. Cooling tower and spray pond.
9 th	1 st	4.3 EVAPORATORS 1.6.1 Principle of working and constructional details of an evaporator
	2 nd	Types of evaporator. Bare tube coil evaporator, finned evaporator, shell and tube

		<i>evaporator.</i>
	3 rd	REFRIGERANT FLOW CONTROLS, REFRIGERANTS & APPLICATION OF REFRIGERANTS EXPANSION VALVES Capillary tube
	4 th	Automatic expansion valve Thermostatic expansion valve
	5 th	REFRIGERANTS Classification of refrigerants Desirable properties of an ideal refrigerant.
10 th	1 st	Designation of refrigerant. Thermodynamic Properties of Refrigerants.
	2 nd	Chemical properties of refrigerants. commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717 Substitute for CFC
	3 rd	Applications of refrigeration cold storage dairy refrigeratio
	4 th	ice plant water cooler frost free refrigerator
11 th	1 st	PSYCHOMETRICS & COMFORT AIR CONDITIONING SYSTEMS Psychometric terms
	2 nd	Adiabatic saturation of air by evaporation of water Psychometric chart and uses.
	3 rd	Psychometric processes Sensible heating and Cooling 6.4.2 Cooling and Dehumidification 6.4.3 Heating and Humidification 6.4.4 Adiabatic cooling with humidification
	4 th	Total heating of a cooling process SHF, BPF,
12 th	1 st	6.4.7 Adiabatic mixing
	2 nd	6.4.8 Problems on above
	3 rd	6.4.8 Problems on above
	4 th	6.4.8 Problems on above
13 th	1 st	6.5 Effective temperature and Comfort chart
	2 nd	AIR CONDITIONING SYSTEMS Factors affecting comfort air conditioning.
	3 rd	7.2 Equipment used in an air-conditioning
	4 th	7.3 Classification of air-conditioning system
14 th	1 st	7.4 Winter Air Conditioning System
	2 nd	7.5 Summer air-conditioning system.
	3 rd	7.6 Numerical on above
	4 th	7.6 Numerical on above