

## Lesson Plan

<b>Discipline:</b> Mech. Engg.	<b>Semester:</b> Fifth (5 <sup>th</sup> )	<b>Name of the Faculty:</b> Er Labendu Mohapatra
<b>Subject:</b> Refrigeration and Air conditioning	<b>No. of days/week class allotted:</b> Five (5)	<b>Semester from Date:</b> 15.09.22 <b>to Date:</b> 22.12.22 <b>No. of Weeks:</b> 15
<b>WEEK</b>	<b>CLASS DAY</b>	<b>THEORY TOPICS</b>
1 <sup>st</sup>	1 <sup>st</sup>	Introduction to Refrigeration & air Conditioning
	2 <sup>nd</sup>	Definition of refrigeration and unit of refrigeration.
	3 <sup>rd</sup>	Definition of COP, Refrigerating effect (R.E)
	4 <sup>th</sup>	Principle of working of open and closed air system of refrigeration.
	5 <sup>th</sup>	Calculation of COP of Bell-Coleman cycle and numerical on it.
2 <sup>nd</sup>	1 <sup>st</sup>	Solving Numerical
	2 <sup>nd</sup>	Solving Numerical
	3 <sup>rd</sup>	Review Class
	4 <sup>th</sup>	Schematic diagram of simple vapour compression refrigeration system.
	5 <sup>th</sup>	Types of vapour compression refrigeration cycle.
3 <sup>rd</sup>	1 <sup>st</sup>	Cycle with dry saturated vapour after compression.
	2 <sup>nd</sup>	Solving Numerical
	3 <sup>rd</sup>	Cycle with wet vapour after compression.
	4 <sup>th</sup>	Solving Numerical
	5 <sup>th</sup>	Cycle with superheated vapour after compression.
4 <sup>th</sup>	1 <sup>st</sup>	Solving Numerical
	2 <sup>nd</sup>	Monthly Test
	3 <sup>rd</sup>	Cycle with superheated vapour before compression.
	4 <sup>th</sup>	Solving Numerical
	5 <sup>th</sup>	Cycle with sub cooling of refrigerant
5 <sup>th</sup>	1 <sup>st</sup>	Solving Numerical
	2 <sup>nd</sup>	Representation of above cycle on temperature entropy and pressure enthalpy diagram
	3 <sup>rd</sup>	Numerical on above (determination of COP, mass flow)
	4 <sup>th</sup>	Review Class
	5 <sup>th</sup>	Simple vapour absorption refrigeration system

6 <sup>th</sup>	1 <sup>st</sup>	Cont..
	2 <sup>nd</sup>	Practical vapour absorption refrigeration system
	3 <sup>rd</sup>	Cont..
	4 <sup>th</sup>	COP of an ideal vapor absorption refrigeration system
	5 <sup>th</sup>	Numerical on COP.
7 <sup>th</sup>	1 <sup>st</sup>	Review Class
	2 <sup>nd</sup>	Monthly Test
	3 <sup>rd</sup>	Principle of working and constructional details of reciprocating and rotary compressors.
	4 <sup>th</sup>	Cont...
	5 <sup>th</sup>	Centrifugal compressor only theory
8 <sup>th</sup>	1 <sup>st</sup>	Important terms.
	2 <sup>nd</sup>	Hermetically and semi hermetically sealed compressor.
	3 <sup>rd</sup>	Principle of working and constructional details of air cooled and water-cooled condenser
	4 <sup>th</sup>	Cont..
	5 <sup>th</sup>	Heat rejection ratio. Cooling tower and spray pond.
9 <sup>th</sup>	1 <sup>st</sup>	Principle of working and constructional details of an evaporator.
	2 <sup>nd</sup>	Types of evaporators. Bare tube coil evaporator, finned evaporator, shell and tube evaporator.
	3 <sup>rd</sup>	Shell and tube evaporator. Review Class
	4 <sup>th</sup>	Capillary tube
	5 <sup>th</sup>	Automatic expansion valve
10 <sup>th</sup>	1 <sup>st</sup>	Thermostatic expansion valve
	2 <sup>nd</sup>	Monthly Test
	3 <sup>rd</sup>	Refrigerants, Classification of refrigerants and Desirable properties of an ideal refrigerant.
	4 <sup>th</sup>	Designation of refrigerant.
	5 <sup>th</sup>	Thermodynamic Properties of Refrigerants.
11 <sup>th</sup>	1 <sup>st</sup>	Chemical properties of refrigerants.
	2 <sup>nd</sup>	Commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717
	3 <sup>rd</sup>	Substitute for CFC
	4 <sup>th</sup>	Cold storage and dairy refrigeration
	5 <sup>th</sup>	Ice plant, water cooler and frost-free refrigerator
	1 <sup>st</sup>	Review Class
	2 <sup>nd</sup>	Psychometric terms

12 <sup>th</sup>	3 <sup>rd</sup>	Adiabatic saturation of air by evaporation of water
	4 <sup>th</sup>	Psychometric chart and uses.
	5 <sup>th</sup>	Sensible heating and Cooling
13 <sup>th</sup>	1 <sup>st</sup>	Solving Numerical
	2 <sup>nd</sup>	SHF, BPF, Cooling and Dehumidification
	3 <sup>rd</sup>	Solving Numerical
	4 <sup>th</sup>	Heating and Humidification
	5 <sup>th</sup>	Solving Numerical
14 <sup>th</sup>	1 <sup>st</sup>	Adiabatic cooling with humidification
	2 <sup>nd</sup>	Total heating of a cooling process, Adiabatic mixing
	3 <sup>rd</sup>	Effective temperature and Comfort chart
	4 <sup>th</sup>	Review Class
	5 <sup>th</sup>	Monthly Test
15 <sup>th</sup>	1 <sup>st</sup>	Factors affecting comfort air conditioning
	2 <sup>nd</sup>	Equipment used in an air-conditioning System. Classification of air-conditioning system
	3 <sup>rd</sup>	Winter Air Conditioning System
	4 <sup>th</sup>	Summer air-conditioning system
	5 <sup>th</sup>	Numerical on above and review Class