

**GOVERNMENT POLYTECHNIC JAJPUR**  
A/ P: Ragadi, Block: Korei, Dist.: Jajpur, Odisha- 755019

**DEPARTMENT OF MECHANICAL ENGINEERING**

**LESSON PLAN**

<b>Discipline: Mechanical</b>	<b>Semester: 5th</b>	<b>Name of the Teaching faculty: Suprava Behera</b>
<b>Subject: Refrigeartion and Air conditioning</b>	<b>No of Days/Week class allotted: 4</b>	<b>Semester from Date: 01.08.2023 To Date: 30.11.2023 No of weeks: 15</b>
<b>Week</b>	<b>Class Day</b>	<b>Topics</b>
1st	1st	Introduction to Refrigeration and Air Conditioning and definition of refrigeration, unit of refrigeration.
	2nd	Definition of COP, Refrigerating effect (R.E)
	3rd	Principle of working of open and closed air system of refrigeration.
	4th	Calculation of COP of Bell-Coleman cycle
2nd	1st	Solve simple problems on above.
	2nd	Working principle of simple vapors compression refrigeration system
	3rd	Cycle with dry saturated vapors after compression
	4th	Cycle with wet vapors after compression
3rd	1st	Solve simple problems on above.
	2nd	Cycle with superheated vapors after compression.
	3rd	Cycle with superheated vapors before compression.
	4th	Solve simple problems on above.
4th	1st	Cycle with sub cooling of refrigerant
	2nd	Review class, solve simple problems on above.
	3rd	Representation of above cycle on temperature entropy and pressure enthalpy diagram
	4th	Working principle of Simple vapor absorption refrigeration system
5th	1st	Solve simple problems on above.
	2nd	Working principle of Practical vapor absorption refrigeration system
	3rd	Review class, Solve simple problems on above.
	4th	Calculation of COP of an ideal vapor absorption refrigeration system

6th	1st	Solve simple problems on above.
	2nd	Comparison between Simple vapor absorption and Practical vapor absorption refrigeration system
	3rd	Assignment evaluation/class test
	4th	Principle of working and constructional details of reciprocating compressors
7th	1st	Principle of working and constructional details of rotary compressors
	2nd	Centrifugal compressor and Important terms related to compressor
	3rd	Hermetically and semi hermetically sealed compressor.
	4th	Principle of working and constructional details of air cooled and water cooled condenser
8th	1st	Cooling tower and spray pond
	2nd	Principle of working and constructional details of an evaporator.
	3rd	Types of evaporator- Bare tube coil evaporator, finned evaporator, shell and tube evaporator.
	4th	Function of Expansion Valves and classification (Automatic expansion valve and Thermostatic expansion valve)
9th	1st	Classification of refrigerants
	2nd	Desirable properties of an ideal refrigerant.
	3rd	Designation of refrigerant
	4th	Thermodynamic Properties and Chemical properties of Refrigerants
10th	1st	commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717 properties
	2nd	Substitute for CFC
	3rd	Applications of refrigeration in food storage and dairy refrigeration
	4th	Applications of refrigeration in ice plant
11th	1st	Applications of refrigeration in water cooler and frost free refrigerator
	2nd	Psychometric terms and adiabatic saturation of air by evaporation of water
	3rd	Psychometric chart and uses.
	4th	Psychometric processes: Sensible heating and Cooling

12th	1st	Cooling and Dehumidification
	2nd	Heating and Humidification
	3rd	Review class, Solve simple problems on above.
	4th	Adiabatic cooling with humidification
13th	1st	Total heating of a cooling process
	2nd	SHF, BPF, Adiabatic mixing and solve simple problems.
	3rd	Effective temperature, factor affecting effective temperature and Comfort chart
	4th	comfort air conditioning.
14th	1st	Factors affecting comfort air conditioning.
	2nd	Equipment used in an air-conditioning.
	3rd	Classification of air-conditioning system
	4th	Working principle of Winter Air Conditioning System
15th	1st	Working principle of Summer air-conditioning system, Solve simple problems on above.
	2nd	Comparison between Winter Air Conditioning System and Summer air-conditioning system.
	3rd	Assignment evaluation/class test
	4th	Previous year Exam question discussion

#### LEARNING RESOURCES

SL.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER
01	C.P ARRORA	REFRIGERATION AND AIR CONDITIONING	TMH
02	R.S.KHURMI & J.K.GOPTA	REFRIGERATION AND AIR CONDITIONING	S.CHAND
03	P.L BALLANY	REFRIGERATION AND AIR CONDITIONING	KHANNA PUBLISHER
04	DOMKUNDRA AND ARORA	REFRIGERATION AND AIR CONDITIONING	DHANPAT RAY AND SONS

*S. Behara*  
31.07.23  
Signature of the Faculty