



GOVERNMENT POLYTECHNIC KANDHAMAL, PHULBANI

Lesson Plan

Subject Name: REFRIGERATION AND AIR CONDITIONING (L-T-P = 4-0-0)

Subject Code: TH-5

Semester: 5th, **Branch:** Mechanical Engineering

Academic Calendar: Winter 2025

Name of the Faculty: Dr Dillip Kumar Panigrahi, Lecturer in Mechanical, Govt. Polytechnic Kandhamal, Phulbani

SI No.	Date	Topics to be Covered as per Lesson Plan	Points / Contents to be Discussed (in detail)
1 st Week	14-07-2025 to 19-07-2025	➤ Air Refrigeration Cycle	➤ Definition of refrigeration and unit of refrigeration. ➤ Definition of COP, Refrigerating effect ➤ Principle of working of open and closed air system of refrigeration. ➤ Calculation of COP of Bell-Coleman cycle and numerical on it.
2 nd Week	21-07-2025 to 26-07-2025	➤ Air Refrigeration Cycle ➤ Simple Vapour Compression Refrigeration System	➤ Calculation of COP of Bell-Coleman cycle and numerical on it. ➤ schematic diagram of simple vapour compression refrigeration system
3 rd Week	28-07-2025 to 02-08-2025	➤ Simple Vapour Compression Refrigeration System	➤ Types ➤ Cycle with dry saturated vapour after compression. ➤ Cycle with wet vapour after compression. ➤ Cycle with superheated vapour after compression. ➤ Numerical on above (determination of COP, mass flow)
4 th Week	04-08-2025 to 09-08-2025	➤ Simple Vapour Compression Refrigeration System	➤ Cycle with superheated vapour before compression. ➤ Cycle with sub cooling of refrigerant ➤ Representation of above cycle on temperature entropy and pressure enthalpy diagram ➤ Numerical on above (determination of COP, mass flow)



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5 th Week	11-08-2025 to 16-08-2025	➤ Vapour Absorption Refrigeration System	➤ Simple vapor absorption refrigeration system ➤ Practical vapor absorption refrigeration system
	15-08-2025	Independence Day/Janmastami	
6 th Week	18-08-2025 to 23-08-2025	➤ Vapour Absorption Refrigeration System	➤ COP of an ideal vapor absorption refrigeration system ➤ Numerical on COP.
7 th Week	25-08-2025 to 30-08-2025	➤ Refrigeration Equipments	➤ REFRIGERANT COMPRESSORS ➤ Principle of working and constructional details of reciprocating and rotary compressors. ➤ Centrifugal compressor only theory ➤ Important terms.
	27-08-2025	Ganesh Puja	
	28-08-2025	Nuakhai	
8 th Week	01-09-2025 to 06-09-2025	➤ Refrigeration Equipments	➤ Hermetically and semi hermetically sealed compressor. ➤ CONDENSERS ➤ Principle of working and constructional details of air cooled and water-cooled condenser ➤ Heat rejection ratio. ➤ Cooling tower and spray pond.
	05-09-2025	Birthday of Prophet Muhammad	
9 th Week	08-09-2025 to 13-09-2025	➤ Refrigeration Equipments ➤ Refrigerant Flow Controls, Refrigerants & Application of Refrigerants	➤ EVAPORATORS ➤ Principle of working and constructional details of an evaporator. ➤ Types of evaporators. ➤ Bare tube coil evaporator, finned evaporator, shell and tube evaporator. ➤ EXPANSION VALVES ➤ Capillary tube ➤ Automatic expansion valve ➤ Thermostatic expansion valve
10 th Week	15-09-2025 to 20-09-2025	➤ Refrigerant Flow Controls, Refrigerants & Application of Refrigerants	➤ REFRIGERANTS ➤ Classification of refrigerants ➤ Desirable properties of an ideal refrigerant.



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			<ul style="list-style-type: none"> ➤ Designation of refrigerant. ➤ Thermodynamic Properties of Refrigerants. ➤ Chemical properties of refrigerants. ➤ commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717 ➤ Substitute for CFC
11 th Week	22-09-2025 to 27-09-2025	<ul style="list-style-type: none"> ➤ Refrigerant Flow Controls, Refrigerants & Application of Refrigerants 	<ul style="list-style-type: none"> ➤ Applications of refrigeration ➤ Cold storage ➤ Dairy refrigeration ➤ Ice plant ➤ Water cooler ➤ Frost free refrigerator
12 th Week	29-09-2025 to 02-10-2025	PUJA VACATION	
	03-10-2025 to 04-10-2025	<ul style="list-style-type: none"> ➤ Psychometrics & Comfort Air Conditioning Systems 	<ul style="list-style-type: none"> ➤ Psychometric terms
13 th Week	06-10-2025 to 11-10-2025	<ul style="list-style-type: none"> ➤ Psychometrics & Comfort Air Conditioning Systems 	<ul style="list-style-type: none"> ➤ Adiabatic saturation of air by evaporation of water ➤ Psychometric chart and uses. ➤ Psychometric processes ➤ Sensible heating and Cooling ➤ Cooling and Dehumidification ➤ Heating and Humidification ➤ Adiabatic cooling with humidification ➤ Total heating of a cooling process
	07-10-2025	Kumar Purnima	
14 th Week	13-10-2025 to 18-10-2025	<ul style="list-style-type: none"> ➤ Psychometrics & Comfort Air Conditioning Systems 	<ul style="list-style-type: none"> ➤ SHF, BPF ➤ Adiabatic mixing ➤ Problems on above. ➤ Effective temperature and Comfort chart
15 th Week	20-10-2025 to	<ul style="list-style-type: none"> ➤ Air Conditioning Systems 	<ul style="list-style-type: none"> ➤ Factors affecting comfort air conditioning. ➤ Equipment used in an air-conditioning.



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	25-10-2025		
	21-10-2025	Diwali	
16 th Week	27-10-2025 to 01-11-2025	➤ Air Conditioning Systems	➤ Classification of air-conditioning system ➤ Winter Air Conditioning System ➤ Summer air-conditioning system.
17 th Week	03-11-2025 to 08-11-2025	➤ Air Conditioning Systems	➤ Numerical on Air Conditioning Systems.
	05-11-2025	Rahas Purnima	
18 th Week	10-11-2025 to 15-11-2025	Revision	
19 th Week	17-11-2025 to 22-11-2025	Revision	

REFERENCES:

SL.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER
01	C.P ARRORA	REFRIGERATION AND AIR CONDITIONING	TMH
02	R. S. KHURMI & J. K. GUPTA	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

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