

# REFRIGERATION & AIR CONDITIONING

NAME OF THE FACULTY - Sri Prafulla K. Mallick, PTGF

GOVT. POLYTECHNIC, NAYAGARH

5<sup>th</sup> SEMESTER MECHANICAL ENGINEERING(2023-24)

SUBJECT- REFRIGERATION AND AIR CONDITIONING

TOTAL PERIOD-60

THEORY-4P/WEEK

NAME OF FACULTY: Prafulla Kumar Mallick, PTGF(MECH)

SI No.	week	Day	Topics to be covered
1	1 <sup>st</sup>	1 <sup>st</sup> day	Definition of refrigeration and unit of refrigeration
		2 <sup>nd</sup> day	Definition of COP, Refrigerating effect (R.E)
		3 <sup>rd</sup> day	Principle of working of open and closed air system of refrigeration.
		4 <sup>th</sup> day	Calculation of COP of Bell-Coleman cycle and numerical on it.
SI No.	week	Day	Topics to be covered
2	2 <sup>nd</sup>	1 <sup>st</sup> day	Simple vapour compression refrigeration system Introduction
		2 <sup>nd</sup> day	Schematic diagram of simple vapors compression refrigeration system.
		3 <sup>rd</sup> day	Cycle with dry saturated vapors after compression.
		4 <sup>th</sup> day	Cycle with wet vapors after compression.
SI No.	week	Day	Topics to be covered
3	3 <sup>rd</sup>	1 <sup>st</sup> day	Cycle with superheated vapors after compression.
		2 <sup>nd</sup> day	Cycle with superheated vapors before compression.
		3 <sup>rd</sup> day	Cycle with sub cooling of refrigerant
		4 <sup>th</sup> day	Representation of above cycle on temperature entropy and pressure enthalpy diagram and Numericals
SI No.	week	Day	Topics to be covered
4	4 <sup>th</sup>	1 <sup>st</sup> day	Simple vapour absorption refrigeration system
		2 <sup>nd</sup> day	Practical vapour absorption refrigeration system
		3 <sup>rd</sup> day	COP of an ideal vapour absorption refrigeration system
		4 <sup>th</sup> day	Numerical on COP.
SI No.	week	Day	Topics to be covered
5	5 <sup>th</sup>	1 <sup>st</sup> day	Principle of working and constructional details of reciprocating and rotary compressors.
		2 <sup>nd</sup> day	Centrifugal compressor only theory
		3 <sup>rd</sup> day	Hermetically and semi hermetically sealed compressor
		4 <sup>th</sup> day	Principle of working and constructional details of air cooled and water cooled condenser
SI No.	week	Day	Topics to be covered
6	6 <sup>th</sup>	1 <sup>st</sup> day	Heat rejection ratio
		2 <sup>nd</sup> day	Cooling tower and spray pond of condenser
		3 <sup>rd</sup> day	Principle of working and constructional details of an evaporator
		4 <sup>th</sup> day	Types of evaporator
SI No.	week	Day	Topics to be covered

7	7 <sup>th</sup>	1 <sup>st</sup> day	EXPANSION VALVES
		2 <sup>nd</sup> day	Capillary tube and Automatic expansion valve
		3 <sup>rd</sup> day	Thermostatic expansion valve
		4 <sup>th</sup> day	Classification of refrigerants
SI No.	week	Day	<b>Topics to be covered</b>
8	8 <sup>th</sup>	1 <sup>st</sup> day	Desirable properties of an ideal refrigerant.
		2 <sup>nd</sup> day	Thermodynamic Properties of Refrigerants.
		3 <sup>rd</sup> day	Chemical properties of refrigerants.
		4 <sup>th</sup> day	Commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717
SI No.	week	Day	<b>Topics to be covered</b>
9	9 <sup>th</sup>	1 <sup>st</sup> day	Applications of refrigeration
		2 <sup>nd</sup> day	cold storage, dairy refrigeration & water cooler
		3 <sup>rd</sup> day	Frost free refrigerator
		4 <sup>th</sup> day	Psychometric terms
SI No.	week	Day	<b>Topics to be covered</b>
10	10 <sup>th</sup>	1 <sup>st</sup> day	Adiabatic saturation of air by evaporation of water
		2 <sup>nd</sup> day	Psychometric chart and uses
		3 <sup>rd</sup> day	Psychometric processes
		4 <sup>th</sup> day	Sensible heating and Cooling
SI No.	week	Day	<b>Topics to be covered</b>
11	11 <sup>th</sup>	1 <sup>st</sup> day	Cooling and Dehumidification
		2 <sup>nd</sup> day	Heating and Humidification
		3 <sup>rd</sup> day	Adiabatic cooling with humidification
		4 <sup>th</sup> day	Total heating of a cooling process
SI No.	week	Day	<b>Topics to be covered</b>
12	12 <sup>th</sup>	1 <sup>st</sup> day	SHF, BPF
		2 <sup>nd</sup> day	Adiabatic mixing
		3 <sup>rd</sup> day	Problems on above
		4 <sup>th</sup> day	
SI No.	week	Day	<b>Topics to be covered</b>
13	13 <sup>th</sup>	1 <sup>st</sup> day	AIR CONDITIONING SYSTEMS
		2 <sup>nd</sup> day	Factors affecting comfort air conditioning.
		3 <sup>rd</sup> day	Equipment used in an air-conditioning

		4 <sup>th</sup> day	Classification of air-conditioning system
Sl No.	week	Day	Topics to be covered
14	14 <sup>th</sup>	1 <sup>st</sup> day	Winter Air Conditioning System
		2 <sup>nd</sup> day	Summer air-conditioning system.
		3 <sup>rd</sup> day	Numerical Problem solving
		4 <sup>th</sup> day	Numerical Problem solving
Sl No.	week	Day	Topics to be covered
15	15 <sup>th</sup>	1 <sup>st</sup> day	Summer air-conditioning system.
		2 <sup>nd</sup> day	Numericals problem solving
		3 <sup>rd</sup> day	Doubt clearance and Revision
		4 <sup>th</sup> day	Doubt clearance and Revision

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