LESSON PLAN

SUB: RAC

BRANCH:- MECHANICAL ENGG.

SEMESTER: 5TH

NAME OF FACULTY: ER. SRI SABYASACHI JAGANNATH MISHRA
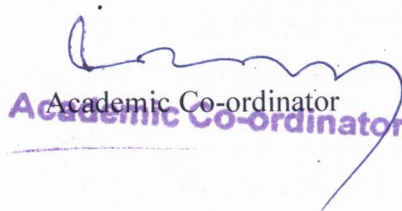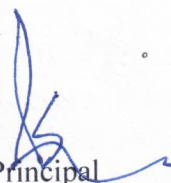

GOVERNMENT POLYTECHNIC, BHADRAK
SESSION:2025-26

Hod ,Mechanical	Academic Co-ordinator	Principal
		Govt. Polytechnic, Bhadrak

ACADEMIC LESSON PLAN FOR REFRIGERATION & AIR CONDITIONING (TH-5)

Discipline: **MECHANICAL ENGG**	Semester: **5th**	Name of the Teaching Faculty:- **SRI SABYASACHI JAGANNATH MISHRA.**
Subject: **RAC**	No. of days/per week class allotted:**04**	Semester From date: 14/07/2025To Date: 15/11/2025 No.ofWeeks:**15**

Week	Class Day	Theory Topics
		AIR REFRIGERATION CYCLE.
1ST	1ST	Definition of refrigeration and unit of refrigeration.Definition of COP.
	2ND	Refrigerating effect (R.E).Principle of working of open and closed air system of refrigeration.
	3RD	Calculation of COP of Bell-Coleman cycle.
	4TH	PYQ discussion and Numerical practice on above.
2ND	1ST	PYQ discussion and Numerical practice on above.
		SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM
	2ND	schematic diagram of simple vapors compression refrigeration system and mechanism of VCRS.
	3RD	Cycle with dry saturated vapors after compression with P-h and T-S diagram.
	4TH	Cycle with wet vapors after compression with P-h and T-S diagram.
3RD	1ST	Cycle with superheated vapors after compression with P-h and T-S diagram.
	2ND	Cycle with superheated vapors before compression.
	3RD	Cycle with sub cooling of refrigerant
	4TH	PYQ discussion and Numerical practice on above.
4TH	1ST	PYQ discussion and Numerical practice on above.
	2ND	PYQ discussion and Numerical practice on above.
	3RD	PYQ discussion and Numerical practice on above.
		VAPOUR ABSORPTION REFRIGERATION SYSTEM
	4TH	Simple vapor absorption refrigeration system
5TH	1ST	Simple vapor absorption refrigeration system
	2ND	Practical vapor absorption refrigeration system
	3RD	COP of an ideal vapor absorption refrigeration system
	4TH	COP of an ideal vapor absorption refrigeration system
6TH	1ST	PYQ discussion and Numerical on COP.
	2ND	PYQ discussion and Numerical on COP.
		REFRIGERATION EQUIPMENTS
	3RD	REFRIGERANT COMPRESSORS;Principle of working and constructional details of reciprocating and rotary compressors.
	4TH	Centrifugal compressor only theory.Important terms.
7TH	1ST	Hermetically and semi hermetically sealed compressor.

	2ND	CONDENSERS;Principle of working and construction details of air cooled and water cooled condenser.
	3RD	Heat rejection ratio.Cooling tower and spray pond.
	4TH	EVAPORATORS;Principle of working and constructional details of an evaporator.Types of evaporator.
8TH	1ST	Bare tube coil evaporator, finned evaporator, shell and tube evaporator.
	2ND	PYQ discussion
		REFRIGERANT FLOW CONTROLS, REFRIGERANTS & APPLICATION OF REFRIGERANTS
	3RD	EXPANSION VALVES;Capillary tube,
	4TH	Automatic expansion valve,Thermostatic expansion valve.
9TH	1ST	REFRIGERANTS;Classification of refrigerants,Desirable properties of an ideal refrigerant.
	2ND	Designation of refrigerant.
	3RD	Thermodynamic Properties of Refrigerants.Chemical properties of refrigerants.
	4TH	commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717. Substitute for CFC
10TH	1ST	Applications of refrigeration;cold storage,dairy refrigeration.
	2ND	ice plant,water cooler.
	3RD	frost free refrigerator.
	4TH	PYQ discussion
		PSYCHOMETRICS &COMFORT AIR CONDITIONING SYSTEMS
11TH	1ST	Psychometric terms.
	2ND	Adiabatic saturation of air by evaporation of water;Psychometric chart and uses.
	3RD	PSYCHOMETRIC PROCESSES;Sensible heating and Cooling;Cooling and Dehumidification.
	4TH	Heating and Humidification;Adiabatic cooling with humidification.
12TH	1ST	Total heating of a cooling process.
	2ND	SHF, BPF,
	3RD	Adiabatic mixing.
	4TH	Problems on above.
13TH	1ST	Effective temperature and Comfort chart
	2ND	PYQ discussion & Problems on above.
		AIR CONDITIONING SYSTEMS
	3RD	Factors affecting comfort air conditioning. .
	4TH	Factors affecting comfort air conditioning. .
14TH	1ST	Equipment used in an air-conditioning.
	2ND	Classification of air-conditioning system
	3RD	Winter Air Conditioning System
	4TH	Winter Air Conditioning System
15TH	1ST	Summer air-conditioning system.
	2ND	Summer air-conditioning system.
	3RD	PYQ discussion &Numerical on above
	4TH	PYQ discussion &Numerical on above

Learning Resouces:

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

Sabyasachi Jagannath Mishra
Lect. Stage-l Mechanical Engineering