GOVT. POLYTECHNIC MAYURBHANJ , TIKARPADA

ACADEMIC SESSION-2022-23 , LESSON PLAN

Discipline : MECHANICAL ENGG.		Semester: 3rd Sem	Name of the Teaching Faculty :SASMITA SAHA
Subject : THERMAL ENGG.-I		No. of Days / per week class allotted : 04	Semester From date : 15/9/22 To Date : 21/1/23
MONTH	**Week**	**Day**	**Topics**
SEPTEMBER	4th	Ist	**CHAPTER-1 :Thermodynamic concept & Terminology**: Thermodynamic Systems (closed, open, isolated)
		2nd	Thermodynamic properties of a system (pressure, volume, temperature}
		3rd	entropy, enthalpy, Internal energy and units of measurement.
		3rd	Intensive and extensive properties Define thermodynamic processes, path,cycle , state.
	5TH	Ist	Define thermodynamic processes, path,cycle , state..
		2nd	Revision,Path function, point function
		3rd	Thermodynamic Equilibrium
		3rd	Quasi-static Process
OCTOBER	Ist	Ist	work, its sign convention different types of work.
	3rd	Ist	Heat, its sign convention.
		2nd	comparison between heat and work. Mechanical Equivalent of Heat.
		3rd	Work transfer, Displacement work
		3rd	**CHAPTER 2:Laws of Thermodynamics :** State & explain Zeroth law of thermodynamics.
	4th	Ist	State & explain First law of thermodynamics.
		2nd	Limitations of First law of thermodynamics
		3rd	solved problems
		3rd	Application of first lawof thermodynamics (steady flow energy equation)
			CLASS TEST-1
	5TH	2nd	SFEE application to turbine and compressor.
		3rd	Solved problems
		3rd	Solved problems on SFEE.
NOVEMBER	Ist	2nd	Second law of thermodynamics, TER MER Heat engine
		3rd	Refrigerator, Heat pump. COP
		3rd	Solved problems on Heat engine.
	2nd	1st	Clausius & Kelvin Planck statements
		3rd	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P
		3rd	Solved problems on Refrigerator heat pump
	3rd	Ist	**CHAPTER 3:Properties Processes of perfect gas :** Laws of perfect gas, Boyle's law, Charle's law,
		2nd	Dalton's law of partial pressure, Guy lussac law
		3rd	General gas equation, characteristic gas constant, Universal gas constant
		3rd	Explain specific heat of gas (Cp and Cv) Relation between Cp & Cv.
	4th	Ist	Enthalpy of a gas. Work done during a non- flow process
		2nd	Application of first law of thermodynamics to various non flow process Isothermal, Isobaric, isochoric process.
		3rd	Solved Problems
		3rd	Isentropic and polytrophic process
	5TH	Ist	solved problems
		2nd	Free expansion & throttling process
		3rd	Revision .
		3rd	**CHAPTER 4: Internal combustion engine :** Explain & classify I.C engine.
	IST	Ist	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM
		2nd	Explain the working principle of 2-Stroke C I engine.
		3rd	Explain the working principle of 2-Stroke S I engine.
		3rd	Explain the working principle of 4 -Stroke petrol engine.
	2nd	Ist	Explain the working principle of 4 -Stroke diesel engine.
		2nd	Difference between petrol engine and diesel engine.

DECEMBER	2nd	3rd	Comparision between two stroke engine and four stroke engine.
		3rd	Revision .
	3rd	Ist	**CHAPTER 5:Gas Power Cycle:** Introduction of gas power cycle and impotant terms used in gas power cycle.
		2nd	Carnot cycle
		3rd	simple problem solved on Carnot cycle.
		3rd	Otto Cycle
	4th	Ist	Solved problems on Otto Cycle.
		2nd	Diesel cycle
		3rd	Revision .
		3rd	Revision .
			INTERNAL EXAMINATION
JANUARY	IST	Ist	Solved problems on Diesel Cycle,
		2nd	Dual cycle.
		3rd	simple problem Solved
		3rd	Revision .
	2nd	Ist	**CHAPTER 6:Fuels and Combustion :** Define Fue. Types of fuel
		2nd	Application of different types of fuel.
		3rd	**CLASS TEST-II**
		3rd	**CLASS TEST-II**
	3rd	Ist	Heating values of fuel
		2nd	Quality of I.C engine fuels Octane number
		3rd	Cetane number
		3rd	Revision .

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ACADEMIC SESSION-2022-23 , LESSON PLAN

Discipline : MECHANICAL ENGG.	Semester: 5th Sem	Name of the Teaching Faculty :SASMITA SAHA
Subject : Refrigeration & air conditioning	No. of Days / per week class allotted : 04	Semester From date : 15/9/22 To Date : 21/1/23

MONTH	Week	Day	Topics
SEPTEMBER	3rd	4th	**Chapter-1: AIR REFRIGERATION CYCLE -**Definition of refrigeration and unit of refrigeration
		5th	Bell- Coleman air cycle
	4th	Ist	Principle of working of open and closed air system of refrigeration
		3rd	Calculation of COP of Bell-Coleman cycle.
		4th	solved problems
		5th	solved problems
	5TH	Ist	**Chapter- 2** : **Simple vapour compression refrigeration system** :-Schematic diagram of simple vapors compression refrigeration system'
		3rd	Types of simple vapors compression refrigeration system' : Cycle with dry saturated vapors after compression. Solve problem
		4th	Cycle with wet vapors after compression. Solve problem
		5th	Cycle with superheated vapors after compression.
	Ist	1st	Cycle with superheated vapors before compression.
	3rd	1st	Cycle with sub cooling of refrigerant ,solve problems
		3rd	Representation of above cycle on temperature entropy and pressure enthalpy diagram
		4th	Numerical on above (determination of COP,mass flow)
		5th	Revisions

OCTOBER	4th	1st	**Chapter -3 :Vapour absorption refrigeration system**
		3rd	Simple vapor absorption refrigeration system.
		4th	**CLASS TEST- I**
		5th	Practical vapor absorption refrigeration system
	5TH	3rd	Practical vapor absorption refrigeration system
		4th	comparision between VARS and VCRS
		5th	COP of an ideal vapour absorption refrigerationsystem
NOVEMBER	Ist	3rd	Numerical on COP
		4th	**Chapter-4: Refrigeration equipments :-** REFRIGERANT COMPRESSORS Principle of working and constructional details of reciprocating
		5th	Principle of working and constructional details of rotary compressors. .
	2nd	1st	Centrifugal compressor only theory and
		3rd	Revision
		4th	Important terms, Hermetically and semi hermetically sealed compressor
		5th	Principle of working and constructional details of air cooled and water cooled condenser
	3rd	1st	Heat rejection ratio, Cooling tower and spray pond.
		3rd	Principle of working and constructional details of an evaporator
		4th	Types of evaporator, Bare tube coil evaporator, finned evaporator,
		5th	shell and tube evaporator
	4th	1st	**Chapter-5: Refrigerant flow control, refrigerants & applications of refrigerants**-Capillary tube,Automatic expansion valve
		3rd	Thermostatic expansion valve ,
		4th	Refrigerant, Classification of refrigerants
		5th	Desirable properties of an ideal refrigerant. Designation of refrigerant.

	5TH	1st	Thermodynamic Properties of Refrigerants.
		3RD	Chemical properties of refrigerants
DECEMBER	Ist	4th	Commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717
		5th	Substitute for CFC
	2nd	Ist	Applications of refrigeration ,cold storage , dairy refrigeration
		3rd	ice plant ,
		4th	water cooler
		5th	frost free refrigerator
	3rd	1st	Revision
		3rd	**Chapter-6 :Psychometrics & comfort air conditioning system :** Psychometric terms
		4th	Psychometric relations
		5th	Adiabatic saturation of air by evaporation of water
	4th	1st	Psychometric chart and uses.
		3rd	Psychometric processes - Sensible heating and Cooling,
		4th	Cooling and Dehumidification .,Solve problems
		5th	INTERNAL EXAMINATION
JANUARY	IST	1st	Heating and Humidification ,Adiabatic cooling with humidification
		3rd	Total heating of a cooling process ,SHF, BPF, Adiabatic mixing
		4th	human confort ,Effective temperature ,Comfort chart
		5th	**Chapter-7: Air conditioning system :**Factors affecting comfort air conditioning
	2nd	1st	Factors affecting optimum effective temperature.
		3rd	Equipment used in an air-conditioning
		4th	**CLASS TEST-II**

		5th	Classification of air-conditioning system
	3rd	1st	Winter Air Conditioning System
		3rd	Summer air-conditioning system
		4th	Numerical on above
		5th	Revision

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