EVEN SEMESTER TEACHING PLAN

Teacher's name:	**Dr. Sandarbh Shukla**
Subject:	**Refrigeration & Air-Conditioning**
Subjectcode:	**RME-061**
Course:	**B. TECH.**
Branch:	**ME (VI SEM); Section- ME-1**
Course credits:	**04**
Total no. Of lectures required:	**49**
Lectures Per Week:	**04**

UNIT	Lecture No.	Topic to be taught	Remarks
UNIT-1 Refrigeration	1.	Introduction to refrigeration system,	
	2.	Methods of refrigeration,	
	3.	Unit of refrigeration, Refrigeration effect & C.O.P.	
	4.	Carnot refrigeration cycle	
	5.	Open and closed air refrigeration cycles, Reversed Carnot cycle	
	6.	Numerical related with C.O.P. and Reversed Carnot Cycle.	
	7.	Bell Coleman or Reversed Joule air refrigeration cycle.	
	8.	Aircraft refrigeration system, Classification of aircraft refrigeration system.	
	9.	Boot strap refrigeration system, Reduced ambient Air Cooling System	
	10.	Regenerative Air Cooling system, Dry air rated temperature (DART)	
	11.	Numerical related with closed cycle, Boot strap refrigeration system.	
UNIT-2 Vapour Compression System	12.	Single stage system, Analysis of vapour compression cycle	
	13.	Use of T-S and P-H charts	
	14.	Effect of change in suction and discharge pressures on C.O.P	
	15.	Effect of sub cooling of condensate on C.O.P of the cycle	
	16.	Superheating of refrigerant vapour on C.O.P of the cycle	
	17.	Actual vapour compression refrigeration cycle	
	18.	Multistage vapour compression system requirement	
	19.	Removal of flash gas, Intercooling	
	20.	Different configuration of multistage system, Cascade system	
	21.	Numerical related with Vapour Compression Cycle	
	22.	Numerical related with actual Vapour Compression Cycle	
UNIT-3 Vapour Absorption system& Refrigerants	23.	Working Principal of vapour absorption refrigeration system,	
	24.	Comparison between absorption & compression systems, Elementary idea of refrigerant absorbent mixtures	
	25.	Temperature – concentration diagram & Enthalpy – concentration diagram	
	26.	Adiabatic mixing of two streams, Ammonia – Water vapour absorption system, Lithium- Bromide water vapour absorption system	

	27.	Three fluid system & Numerical related with the cycle	
	28.	Classification of refrigerants, Nomenclature,	
	29.	Desirable properties of refrigerants, Common refrigerants	
	30.	Secondary refrigerants and CFC free refrigerants, Ozone layer depletion and global warming considerations of refrigerants.	
	31.	Numerical related with vapour absorption cycle	
	32.	Numerical related with vapour absorption cycle	
UNIT-4 Air Conditioning	33.	Introduction to air conditioning,	
	34.	Psychometric properties and their definitions,	
	35.	Psychometric chart, Different Psychometric processes,	
	36.	Thermal analysis of human body, Effective temperature and comfort chart.	
	37.	Cooling and heating load calculations,	
	38.	Selection of inside & outside design conditions, Heat transfer through walls & roofs, Infiltration & ventilation.	
	39.	Internal heat gain, Sensible heat factor (SHF)	
	40.	Grand Sensible heat factor (GSHF), Apparatus dew point (ADP). Air Washers	
	41.	Cooling towers & humidifying efficiency	
	42.	Numerical related with load calculations	
	43.	Numerical related with various air conditioning system	
UNIT-5 Refrigeration Equipment & Application	44.	Elementary knowledge of refrigeration & air conditioning equipment: Compressors, Condensers.	
	45.	Elementary knowledge of refrigeration & air conditioning equipment: Evaporators, Expansion devices.	
	46.	Food preservation, Cold storage, Refrigerates Freezers.	
	47.	Water coolers, Ice plant.	
	48.	Basic difference between comfort and industrial air conditioning	
	49.	Elementary knowledge of transmission and distribution of air through ducts and fans	