Samrat Ashok Technological Institute, Vidisha			
Department of Mechanical Engineering **Lecture Plan**			
Course Code:	**ME-1182**	**Year/Semester :**	BE final year/VII sem
Course Name:	**Refrigeration & Air-conditioning**	**Academic Year :**	August-2023/ ODD
L – P:	3 – 2	**Credit :**	4
Course Detail :	Theory and Practical	**Term Start Date :**	24-07-2023
Course Coordinator:	Sanjay katarey	**Term End Date :**	
	Kamlesh Sharma		

UNIT I

Objectives: 1.To understand principles and systems of producing refrigeration.

2. To understand unit of refrigeration, refrigerator, heat engine, heat pump.

3.To analyze air refrigeration system cycle and formulate and solve numerical problems.

SN	Lecture	Topics covered	Remark
1	1	History, principles of refrigeration	
2	2	principles of refrigeration	Continue from lecture 1.
3	3	Refrigerator,Heat Engine, Heat Pump,COP	
4	4	Numerical Problems	Continued from lecture 3.
5	5	Air Refrigeration Systems, Carnot Cycle	
6	6	Joule cycle, Boot strape Cycle, Reduced Ambient Cycle	
7	7	Regenerative Cycle, Numerical Problems	Based on lecture 5 and 6.
8	8	Numerical Problems Continue,	
9	9	Tutorials, Problem solving session.	

UNIT II

Objectives: 1.To understand vapor compression refrigeration systems

2.To estimate effect of various parameters on the performance of the cycle.

3. To demonstrate the cycle on TS and PH plane and solve numerical problems.

SN	Lecture	Topics covered	Remark
1	10	Vapor compression cycle, TS and PH diagram	
2	11	Theoretical and practical cycle, sub cooling and super	

		heating	
3	12	Effect of pressure on COP, multy pressure system	
4	13	Multiple compression and expansion, intercooling	
5	14	Low temperature refrigeration , cryogenics	
6	15	Production of low temperature, dry ice, cascade system	Continue from lecture 14.
7	16	Numerical problems using charts and tables.	Based on lecture 10, 11,12.
8	17	Tutorials.	

UNIT III

Objectives: 1.To understand principle and working of Vapor Absorption and steam jet refrigeration system.

2.To understand different types of refrigerants their property and applications, environmental friendly refrigerants.

SN	Lecture	Topics covered	Remark
1	18	Vapor Absorption System, Theoretical and practical system	
2	19	Aqua-ammonia, Electrolux and other systems	
3	20	Steam jet refrigeration system, principle	
4	21	Cycle of operation, working	Continue from lecture 20.
5	22	Refrigerants-nomenclature, classification, desirable properties	
6	23	Common refrigerants, comparison, leak detection	
7	24	Environmental friendly refrigerants, refrigerant mixture	
8	25	Brian and its properties, latest trends in refrigerants	Continue from lecture 24.

UNIT IV

Objectives: 1.To understand air-vapor mixture, its properties, psychrometric charts

2. To understand air-conditioning system, human comfort, chart and regulation of human body.

3. To calculate psychrometric properties in different processes, simple load calculation.

SN	Lecture	Topics covered	Remark
1	26	Air vapor mixture its properties, psychrometric chart	
2	27	Calculation of the properties using charts and tables	
3	28	Psychrometric processes, mixing of air stream, SHF	
4	29	Principle of air-conditioning, human body and comfort	
5	30	Requirment, ventilation, infiltration	Continue from lecture 29.
6	31	Different heating/cooling load, bypass factor	
7	32	Effective temperature and chart,	
8	33	Numerical problems	
9	34	Tutorials	Continue from lecture 33.

UNIT V

Objectives: 1.To calculate winter and summer air conditioning load.

2. To understand and calculate RSHF,GSHF, BPF and supply air requirement

3. To understand air distribution and ventilation system and air-conditioning equipments.

SN	Lecture	Topics covered	Remark
1	35	Calculation of summer and winter air conditioning load	
2	36	Calculation of supply air and its condition	
3	37	RSHF,GSHF, bypass factor,ESHF	
4	38	Numerical problem solving	Based on lecture 35-38.
5	39	Air distribution and ventilation system	
6	40	Air conditioning equipments	
7	41	Cryogenic and other HVAC technologies	