AE-406: Refrigeration & Automobile Air Conditioning										
L	**T**	**P**	Credit	Area		**CWS**	**PRS**	**MTE**	**ETE**	**PRE**
3	0/1	2/0	4	DEC		15/25	25/-	20/25	40/50	-

Objectives: To familiarize the students with the basic concepts of Refrigeration and Air conditioning principles of designing and maintenance of air-conditioning system.

AE-406: Refrigeration & Automobile Air Conditioning		Contact Hours
Unit-1	Refrigeration: ton of Refrigeration, Various Methods of Producing Refrigeration, Applications, Heat Pump, Reversed Carnot Cycle and Its Limitations,	**6**
Unit-2	Vapour Compression Cycle, Subcooling, Superheating, Liquid Vapour Heat Exchanger, Effect of Changes in Evaporator Condenser Temperatures, Deviations From Ideal Cycle. Refrigerants and Their Properties, Alternative Refrigerants	**6**
Unit-3	AIRCONDITIONING FUNDAMENTALS Basic air conditioning system - location of air conditioning components in a car, schematic layout of a refrigeration system, compressor components, condenser and high pressure service ports, thermostatic expansion valve, expansion valve calibration, controlling evaporator temperature, evaporator pressure regulator, evaporator temperature regulator	**7**
Unit-4	AIR CONDITIONER – HEATING SYSTEM Automotive heaters, manually controlled air conditioner, heater system, automatically controlled air conditioner and heater systems, automatic temperature control, air conditioning protection, engine protection	**7**
Unit-5	AIR ROUTING AND TEMPERATURE CONTROL Objectives, evaporator airflow through the recirculation unit, automatic temperature control, duct system, controlling flow, vacuum reserve, testing the air control and handling systems	**8**
Unit-6	AIR CONDITIONING SERVICE Air conditioner maintenance and service, servicing heater system removing and replacing components, trouble shooting of air controlling system, compressor service	**8**
	Total	**42**

Reference Books:	
1	William H. Crouse and Donald I. Anglin - “Automotive Air conditioning” – McGraw Hill Inc. – 1990, ISBN: 9780070148574
2	Boyce H.D Wiggins -”Automotive Air Conditioning” - Delmar – 2002, ISBN:10:0827319428/ISBN: 13:9780827319424
3	Mitchell information Services, Inc - “Mitchell Automatic Heating and Air Conditioning Systems” - Prentice Hall Ind. – 1989, ISBN: 13:978-0135862230, 10:013586223X
4	Paul Weiser - “Automotive Air Conditioning” - Reston Publishing Co., Inc., - 1990, ISBN: 978-0835902618
5	MacDonald, K.I., - “Automotive Air Conditioning” - Theodore Audel series – 1978,ISBN: 0672233185 9870672233180
6.	Goings.L.F. – “Automotive Air Conditioning” - American Technical services -1974, ISBN: 978-0826902108

Course Outcomes

CO1	To study basics of refrigeration and Applications.
CO2	To discuss heat exchanger, different refrigerants and their properties.
CO3	To explain basic air conditioning system and its components.
CO4	To describe air conditioner – heating system
CO5	To implement air routing and temperature control and its different units.
CO6	To apply air conditioner maintenance and service for practical problems

CO-PO/PSOMatrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	0	0	0	0	0	0	2	2	1	1
CO2	3	3	2	3	1	0	0	0	0	0	0	1	2	1	1
CO3	3	3	3	3	1	0	0	0	0	0	0	2	3	3	2
CO4	3	3	3	3	1	0	0	0	0	0	0	1	3	3	2
CO5	2	2	2	2	2	0	0	0	0	0	0	1	2	2	2