

Program : Diploma in Mechanical Engineering / Manufacturing Technology	
Course Code : 6028	Course Title: Refrigeration and Air Conditioning Lab
Semester : 6	Credits: 1.5
Course Category: Program Core	
Periods per week: 3 (L:0, T:0, P:3)	Periods per semester: 45

Course Objectives:

- To impart technical skill for dismantling, servicing and assembling of refrigeration and air conditioning equipments
- To Familiarize with different refrigeration test rigs and conduct various performance tests
- To impart technical skills for dismantling, servicing and assembling of various types of compressor, condenser, expansion device, evaporator etc

Course Prerequisites:

Topic	Course Code	Course Name	Semester
Basic knowledge in problem solving		Mathematics I & II	1 & 2
Modes of heat transfer, enthalpy, air compressors etc.		Thermal Engineering	4

Course Outcomes:

On completion of the course, the student will be able to:

CO _n	Description	Duration (Hours)	Cognitive Level
CO1	Identify the parts of a Vapour Compression refrigeration system and perform general servicing and maintenance	3	Applying
CO2	Apply technical skills in dismantling, servicing and assembling of various types of compressor, condenser, expansion device and evaporator including evacuation, gas charging etc.	15	Applying

CO3	Familiarize with different refrigeration test rigs and conduct various performance tests	12	Applying
CO4	Apply technical skills in dismantling, servicing and assembling of various refrigeration equipment like the air conditioner, water cooler, deep freezer etc.	9	Applying
	Lab Exam	6	

CO – PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3			3			
CO2	3			3	3		
CO3	3			3			
CO4	3			3			

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	Identify the parts of a Vapor Compression refrigeration system and perform general servicing and maintenance		
M1.01	Study the parts and functions of the vapor compression refrigeration system.	1	Understanding
M1.02	Carry out general servicing like filter removal and cleaning of the air conditioner etc.	2	Applying
Contents: Identify the parts and working of the domestic refrigerator window air conditioner etc. Carry out general servicing like filter removal and cleaning of the air conditioner etc.			
CO2	Apply technical skills in dismantling, servicing and assembling of various types of compressor, condenser, expansion device and evaporator including evacuation, gas charging etc.		
M2.01	Dismantle, service and assembling of compressors.	3	Applying
M2.02	Dismantle, service and assembling of condensers.	3	Applying

M2.03	Dismantle, service and assembling of expansion devices.	3	Applying
M2.04	Dismantle, service and assembling of evaporators	3	Applying
M2.05	Filling of suitable refrigerant using a gas charging kit	3	Applying
	Lab Exam I	3	Applying

Contents:

Study the working and perform dismantling, service and assembling of various types of compressor, condenser, expansion device and evaporator.

CO3	Familiarize with different refrigeration test rigs and conduct various performance tests		
M3.01	Conduct the performance test and find COP of the vapour compression refrigeration test rig	3	Applying
M3.02	Conduct the performance test and find COP of the cold storage	3	Applying
M3.03	Conduct the performance test and plot the different thermodynamic curves in the air conditioner test rig	3	Applying
M3.04	Conduct the test on an air conditioning unit and find out psychrometric properties	3	Applying

Contents:

Study the arrangement and working of various test rigs and conduct performance tests in the setup of VC refrigeration test rig, cold storage, air conditioner test rig etc.

CO4	Apply technical skills in dismantling, servicing and assembling of various refrigeration equipment like the air conditioner, water cooler, deep freezer etc.		
M4.01	Dismantle, service & assembling of air conditioner	3	Applying
M4.02	Dismantle, service & assembling of water cooler	3	Applying
M4.03	Dismantle, service & assembling of deep freezer	3	Applying
	Lab Exam-II	3	

Contents:

Study the working of various types of air conditioners, water coolers and deep freezers. Dismantle, service & assembling of air conditioner, water cooler, deep freezer etc.

Text / Reference

T/R	Book Title/Author
T1	Mechanic refrigeration and air-conditioning-G S Sethi
R2	Thermal engineering by R S Khurmi
R3	Refrigeration & Air conditioning - R.S. Khurmi & J.K. Gupta
R4	Refrigeration and Air Conditioning – C.P Arora, Tata McGraw Hill Education, 2000

Online Resources

Sl.No	Website Link
1	www.ishrae.in
2	www.nptel.ac.in/courses/mechanical
3	www.ashrae.org