Birla Institute of Technology & Science, Pilani
Hyderabad Campus

SECOND SEMESTER 2020-2021

Course Handout Part II

Date: 16-01-2021

In addition to part-I (general handout for all courses in the time table) this handout provides the specific details regarding the course.

Course No.: **ME F461**
Course Title: **Refrigeration and Air-conditioning**
Instructor-in-charge: **SANDIP DESHMUKH**
Instructor: **R Parameshwaran**

Scope and Objective: The course is designed to give an in-depth study of theory of refrigeration and air-conditioning and their applications. The techniques of analysis and design of refrigeration and air-conditioning systems will also be discussed.

Text Book: Arora C.P. 'Refrigeration and Air-conditioning', 3rd Ed Tata McGraw Hill Co, 2000

Reference Books:

1. Manohar Prasad, 'Refrigeration and air-conditioning', Wiley Eastern Ltd, 1983
2. Roy J. Dossat, 'Principles of Refrigeration', 4nd Ed, Pearson Education Asia, 2002
3. Edward G. Pita, 'Air Conditioning Principles and Systems', 4nd Ed, Pearson Education Asia, 2003

Course Plan:

Lect No.	Learning Objectives	Topics to be covered	Reference to Text
1	Introduction & Review	Introduction, the second law interpretation, the Carnot principle	1,2
2-5	Gas cycle refrigeration	Limitation of Carnot cycle, reversed Brayton cycle, Air craft refrigeration, Analysis of Gas cycle refrigeration	11
6-9	Vapour	Modification in reversed Carnot cycle,	3

	compression system	Vapour compression cycle, Vapour compression system calculation, etc	
10-13	Multi-pressure systems	Multi stage compression, Multi evaporative systems	5
14-15	Compressors	Principle & performance of reciprocating compressor	6
16	Condensers	Types, Heat transfer in condensers	7
17	Evaporators	Types, Heat transfer in evaporators	8
18	Expansion Valves	Types of expansion devices	9
19	Refrigerants	Designation of refrigerants, comparative study, selection of refrigerant	4
20-23	Vapour absorption system	Vapour absorption system	12
24-28	Psychrometry of air-conditioning processes	Psychrometric properties, Basic processes in conditioning of air, Psychrometric processes in air-conditioning equipment's, Summer & Winter air-conditioning	14,15
29-32	Load Calculations – Cooling & Heating	Design conditions, solar radiations, heat transfer through building structure	17,18,19
33-36	Design of air-conditioning systems	Heat and moisture transfer in air-conditioning equipments	20
37-38	Transmission and distribution of air	Friction loss, dynamic losses in ducts, Air flow through simple duct system, air duct design	21, 22
39-42	RACE Lab Visits (in Video mode)	Four visits to RACE Lab to be planed during the duration of the course	

Evaluation Scheme:

Sr. No.	Evaluation Component	Duration	Weightage (%)	Date & Time	Nature of Component
01	Mid Semester Test	90 min.	30	03/03 3.30 - 5.00PM	Open Book
03	Surprise Quiz/Test	10 min	20	Best 5 out of 7	Open Book
04	Survey Assignment		10	To be announced	Open Book

05	Compre.	2 hrs	40	08/05 FN	Open Book

Chamber Consultancy Hour: To be announced by the instructor in the class.

Notices: All the notices concerning this course will be displayed on *Google Classroom*.

Make-up Policy: Make-up for the tests shall be granted only for the genuine cases with sufficient evidence. Request for the make-up tests, duly signed by the students, should reach the under signed well before the scheduled test.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-in-Charge
ME F461