

Minor Elective from Mechanical Engg Dept

**DEPARTMENT OF MECHANICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

COURSE PLAN – PART I			
Course Title	Fundamentals of Refrigeration and Air-Conditioning		
Course Code	MEMI 17	No. of Credits	3
Course Code of Pre-requisite subject(s)	----		
Session	Jan. 2018	Section (if, applicable)	Minor
Name of Faculty	Mr.M.Shahul Hameed	Department	Mechanical
Email	hameed@nitt.edu	Telephone No.	9677579292
Name of Course Coordinator(s) (if, applicable)	Nil		
E-mail		Telephone No.	
Course Type	<input checked="" type="checkbox"/> Elective course		<input type="checkbox"/> Core course
Syllabus (approved in BoS)			
<p>Introduction about Refrigeration – Definitions of various terms. Methods of refrigeration. Air refrigeration system. Introduction about Air craft Air-Conditioning.</p> <p>Analysis of Vapour compression cycle, Modifications to basic cycle. Multi pressure systems. Brief discussion of components of V.C system. Properties of refrigerants. Selection of refrigerants.</p> <p>Psychrometry – Definitions for properties. Introduction to cooling load calculations.</p> <p>Air-conditioning systems – discussion about the central plant with direct evaporator and chiller applications.</p> <p>Applications- Ice plant, refrigerators. Food preservation, IQF technique and freeze drying etc. Cold storage and thermal insulation.</p>			
COURSE OBJECTIVES			
<ol style="list-style-type: none"> 1. To understand principles of refrigeration and AC. 2. To calculate cooling load requiremnt for different application. 3. To select the right equipment for a particular application. 4. To design and implement AC systems. 5. To conserve and manage energy with a considertion of environmental aspects 			
Course Outcomes			Aligned Programme Outcomes (PO)
1. Illustrate basic concepts of refrigeration. Describe Aircraft AC			1,5

2. Analyse the V.C cycle	1,2,5,6,7
3. Explain components of Vapor Compression system. Interpret usage of refrigerants	2,5
4. Demonstrate the use of psychrometry in analysing AC systms. Describe different types of AC systems	1,2
5. Discuss the applications of Refrigeration and Air-Conditiong systems	1,2,5,6,7

COURSE PLAN – PART II			
COURSE OVERVIEW			
Students to get understanding of fundamentals of refrigeration and air conditioning. Students will be taught about the different thermodynamic cycles (ideal) and their difference with real cycles. Students will understand to represent different refrigeration cycles in different planes like T-s, P-h etc. Students will also be taught about air conditioning and to depict different process in psychrometry chart and to calculate cooling load for a given space.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1-2	Introduction about refrigeration, methods, Air refrigeration system, Aircraft AC.	Chalk and talk
2	3-4	Discussion about V.C.system and V.A systems. Description about V.A system. Analysis of V.C cycle.	Chalk and talk
3	5-6	V.C.cycle problems using p-H chart. Propertiesof refrigerants.	Chalk and talk
3	7-8	Environmental aspects regarding refrigerants. Discussion of V.C.system component.	Chalk and talk and Power point presentation
5	9-10	Psychrometry, various processes. Problems involving single and multi processes using psychrometric chart.	Chalk and talk
6	11-12	AC systems. Classification and discussion of each type. Applications of refrigeration.Iceplant,refrigerator,and miscelleaneous applications.	Chalk and talk and Power point presentation

COURSE ASSESSMENT METHODS (shall range from 4 to 6)				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	1 st CYCLE TEST	After 7 th week	One Hour	20
2	2 nd CYCLE TEST	After 11 th week	One Hour	20
3	Assignment	April 2 nd week	-	10
CPA	Compensation Assessment*	April 2 nd Week	One Hour	20
4	Final Assessment *	End of semester	Three Hour	50
<p>Text & Reference Books:</p> <ol style="list-style-type: none"> 1. Arora.C.P., Refrigeration and Air- Conditioning, 2nd Ed., Tata McGraw-Hill,2000. 2. Roy J.Dossat., Principles of Refrigeration, 4th Ed., Prentice-Hall, 1997. 3. Manohar Prasad., Refrigeration and Air-Conditioning, 3rd Ed.,New Age International, 2015. 				
<p>COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)</p> <ol style="list-style-type: none"> 1. Students can meet the faculty at any stage in the course duration in case he/she finds difficulty in understanding the concept. 2. Feedback form issued to students to express their comments about the course after completing the syllabus. Students are requested to give genuine feedback about the course. 				
<p>COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)</p>				
<p><u>MODE OF CORRESPONDENCE (email/ phone etc)</u></p> <p>Students can reach course faculty by fixing appointment through E-mail hameed@nitt.edu or phone (9677579292)</p>				
<p><u>ASSESSMENT</u></p> <p>Attending all the assessments is MANDATORY for every student.</p> <p>If any student is not able to attend any of the continuous assessments (CTs: 1 -2) due to genuine reason, the student is permitted to attend the compensation assessment (CPA) with % weightage equal to the CTs (20 Marks). Finally, every student is expected to score minimum 33.3 % of the maximum mark of the class in the total assessment to pass the course. Otherwise, the student would be declared fail and F grade will be awarded.</p>				

ATTENDANCE

The minimum attendance for appearing for the semester examination is 75%. Those students, whose attendance falls below 75% but above 50% in a subject, shall attend mandatory classes before the semester examinations to qualify to write semester exam. Students having attendance less than 50% have to redo the course in next semester. The Institute follows relative grading with flexibility given to teachers to decide the mark ranges for grades. All assessment of a course will be done on the basis of marks.

ACADEMIC HONESTY & PLAGIARISM

All the students are expected to be genuine during the coursework. Taking of information by means of copying assignments, looking or attempting to look at another student's paper or bringing and using study material in any form for copying during any assessments is considered dishonest.

Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.

ADDITIONAL INFORMATION

FOR APPROVAL



Course Faculty



CC-Chairperson



HOD

M. Shahid Hussain