Faculty of Engineering & Technology

Heating& Ventilation and Air Conditioning

Information :

Course Code :	MPR 466	**Level :**	Undergraduate	**Course Hours :**	2.00- Hours

Department : Specialization of Mechatronics Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	Mohamed Ahmed Mahmoud Karali	
Assistant Lecturer	Zakaria Mostafa Abdo Salim Marouf	

Area Of Study :

ÅEnrich studentsôknowledge about the heating ventilation and air conditioning processes.
ÅTrain students to perform experiments related to refrigeration and air conditioning.
ÅPrepare students for the practical filed in the work market of refrigeration and air conditioning.

Description :

Refrigeration history and fundamentals, Basic refrigeration cycles and applications, Vapor compression cycle theory; Single stage vapor compression system, Multi-stage vapor compression system, Vapor absorption cycle theory, Refrigerants and environment, Properties of air by Psychometric chart and equations, Air conditioning processes, Air conditioning load analysis and calculations, Air conditioning systems, Air handling units, Duct design.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Define the basic concepts of heating, ventilation and air conditioning.
2 -	Demonstrate the use of psychometric chart to get the properties of moist air.
3 -	Distinguish between different air conditioning processes.
4 -	Estimate the design conditions.
5 -	Distinguish between different methods of load calculations.
b.Intellectual Skills: :	
1 -	Analyze different refrigeration and air conditioning systems.
2 -	Deduce the governing equations to calculate the mass and energy.
3 -	Solve problems related to load calculations.
c.Professional and Practical Skills: :	
1 -	Perform basic experiments on refrigeration and air conditioning.
2 -	Follow up safety requirements at experimental work and observe the appropriate steps to manage risks.
3 -	Analyse experimental results.
4 -	Prepare technical reports on Lab experiments and research activities.

d.General and Transferable Skills: :	
1 -	Collaborate effectively within multidisciplinary team.
2 -	Refer to relevant literatures.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Properties of Moist Air	4	2	2
Psychrometry of Air-Conditioning Processes	6	4	2
Design Conditions	6	4	2
Heat Transfer through Building Structures	6	4	2
Load Calculations and Applied Psychrometrics	9	6	3
Design of Air Conditioning Apparatus	8	6	2
Fans	6	4	2

Teaching And Learning Methodologies :

Interactive Lecturing
Discussion
Problem-based learning
Laboratory experiments
Research activity

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
1st Midterm	15.00	6	
2nd Midterm	15.00	11	
Assignments	5.00		
Final Exam	40.00	16	
Laboratory Experiments	5.00		
Oral Exam	5.00		
Participation	10.00		
Quizzes	5.00		

Course Notes :

1. Lecture notes.
2. Handouts.

Recommended books :

Recommended Readings: Principles of Refrigeration, Roy J. Dossat, Thomas J. Horan, Pearson, 5th edition, 2001.