

## 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                 | Zakaria Mostafa Abdo Salim Marouf |              |
| Assistant Lecturer       | Moustafa Raafat Aziz Shousha      | 1            |

### Area Of Study:

- Understand fundamentals of Heating, ventilation and Air Conditioning
- Apply the fundamental principles of Heating, ventilation and Air Conditioning
- Explore the fundamental principles of Heating, ventilation and Air Conditioning through experimentation
- Develop skills for analyzing experimental data and working in teams
- Share ideas and work in a team.

### **Description:**

Properties of Moist Air, Psychrometry of Air-Conditioning Processes, Design Conditions, Heat Transfer through Building Structures, Load Calculations and, Applied Psychrometrics, Design of Air Conditioning Apparatus, Fans.

| Course ou                        | tcomes :   |  |  |  |
|----------------------------------|--|--|--|--|
| a.Knowledge and Understanding: : |  |  |  |  |
| 1 -                              | Define the basic concepts of Heating, ventilation and Air Conditioning                       |  |  |  |
| 2 -                              | Understand the properties of the Moist Air   |  |  |  |
| 3 -                              | Understand the Psychrometry of Air-Conditioning Processes                                    |  |  |  |
| 4 -                              | Understand the Design Conditions   |  |  |  |
| 5 -                              | Understand Load Calculations and Applied Psychrometric                                       |  |  |  |
| b.Intellect                      | ual Skills: :  |  |  |  |
| 1 -                              | Ability to define and solve problems related to properties of the Moist Air.                 |  |  |  |
| 2 -                              | Ability to define and solve problems related to Psychrometry of Air- Conditioning Processes. |  |  |  |
| 3 -                              | Ability to define and solve problems of Design Conditions                                    |  |  |  |
| 4 -                              | Ability to define and solve problems of Load Calculations and Applied Psychrometric          |  |  |  |
| d.General                        | and Transferable Skills: :   |  |  |  |
| 1 -                              | Ability to work in a team.   |  |  |  |
| 2 -                              | Ability to share ideas and communicate with others   |  |  |  |



3 - Ability to deal with others according to the rules of the professional ethics

| Course Topic And Contents :                  |            |            |                      |  |
|--|------------|------------|----------------------|--|
| Topic  | No. of hou | rs 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 |            | 6          | 3                    |  |
| Design of Air Conditioning Apparatus         |            | 6          | 2                    |  |
| Fans   | 6          | 4          | 2                    |  |

# **Teaching And Learning Methodologies:**

Interactive Lecturing

Problem solving

**Experiential learning** 

Research activity

| Course Assessment :   |                   |         |             |  |  |  |
|-----------------------|-------------------|---------|-------------|--|--|--|
| Methods of assessment | Relative weight % | Week No | Assess What |  |  |  |
| 1st Midterm           | 25.00             | 6       |             |  |  |  |
| 2nd Midterm           | 25.00             | 11      |             |  |  |  |
| Assignments           | 10.00             |         |             |  |  |  |
| Final Exam            | 40.00             | 16      |             |  |  |  |

## **Recommended books:**

Refrigeration and Air Conditioning, S.C. Arora, S. Domkundwar, 2000.