DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
MECHANICAL ENGINEERING PROGRAM, BSC.

Course Syllabus

1. **Course number and name**
   ME 482 HVAC 1

2. **Credits and contact hours**
   (3+0) 3 credit hours, 3 contact hours

3. **Course type**
   Face to face Learning Course (3+0)

4. **Instructor's or course coordinator's name**
   Eng. Dia' A. Afaneh

5. **Textbook information**
   Mohammad Alsaad and Mahmoud Hammad, Heating and Air Conditioning for Residential Buildings, Ajial Press, 2016.
   ISBN: 1-992199-500005

   a. **Other supplemental materials**
   - McQuiston FC, Parker JD. Heating, ventilating, and air conditioning: analysis and design, 6th Edition, 2005.
   - Instructor's Notes

6. **Specific course information**
   a. **Catalog description**
   Review of basic concepts, Psychrometry, Human comfort, Heat transfer in residential buildings, Heating load calculation, Cooling load calculation, Duct design, Supply and Return diffusers.

   b. **Prerequisites or co-requisites**
   Prerequisite: ME 455 Heat transfer.

   c. **The course is:**
   Required in Mechanical Engineering Department.

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7. Specific goals for the course

a. Course outcomes:

After completion of the course, students are expected to be able to:

1. Provide students with the fundamental principles of moist air.
2. Interpret the principles and conditions of the human comfort.
3. Apply the thermodynamic principles to air conditioning processes.
4. Determine the required inside air ventilation quantity.
5. Ability to calculate the heating and cooling loads for a given space.

b. The following student outcomes are addressed by the course:

SO-(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

SO-(f) an understanding of professional and ethical responsibility.

SO-(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

SO-(pc-3) prepare students to work professionally in mechanical systems.

8. Learning Outcomes and their Alignment with Program Educational Objective (PEO's), Methods of Delivery, and Assessment Methods:

Learning Outcomes	Program PEOs	Method of Delivery	Assessment Method
Course Outcomes			
Provide students with the fundamental principles of moist air.	-	Lectures (Example and Problems)	Question in exam
Interpret the principles and conditions of the human comfort.	-	Lectures (Example and Problems)	Question in exam
Apply the thermodynamic principles to air conditioning processes.		Lectures (Example and Problems)	Question in exam

Determine the required inside air ventilation quantity.	-	Lectures (Example and Problems)	Question in exam
Ability to calculate the heating and cooling loads for a given space.	-	Lectures (Example and Problems)	Question in exam
Student Outcomes			
SO-(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability			
SO-(f) an understanding of professional and ethical responsibility.			
SO-(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.			
SO-(pc-3) prepare students to work professionally in mechanical systems.			

9. Weekly Teaching Plan

Week No.	Lecture	Topic	Method of Delivery
1	Sun (9-10)	Chapter 1: Review of basic air conditioning concepts	Lecture
	Tue (9-10)	Chapter 1: Review of basic air conditioning concepts	Lecture
	Thu (9-10)	Chapter 1: Review of basic air conditioning concepts	Lecture
2	Sun (9-10)	Chapter 2: Review of thermodynamics fundamentals.	Lecture
	Tue (9-10)	Chapter 2: Review of thermodynamics fundamentals.	Lecture
	Thu (9-10)	Chapter 2: Review of thermodynamics fundamentals.	Lecture
3	Sun (9-10)	Chapter 3: Psychometry and air conditioning processes	Lecture

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	Tue (9-10)	Chapter 3: Psychometry and air conditioning processes	Lecture
	Thu (9-10)	Chapter 3: Psychometry and air conditioning processes	Lecture
4	Sun (9-10)	Chapter 3: Psychometry and air conditioning processes	Lecture
	Tue (9-10)	Chapter 3: Psychometry and air conditioning processes	Lecture
	Thu (9-10)	Chapter 3: Psychometry and air conditioning processes	Lecture
5	Sun (9-10)	Chapter 3: Psychometry and air conditioning processes	Lecture
	Tue (9-10)	Chapter 3: Psychometry and air conditioning processes	Lecture
	Thu (9-10)	First Exam	Exam
6	Sun (9-10)	Chapter 4: Human comfort chart and acclimatization	Lecture
	Tue (9-10)	Chapter 4: Human comfort chart and acclimatization	Lecture
	Thu (9-10)	Chapter 4: Human comfort chart and acclimatization	Lecture
7	Sun (9-10)	Chapter 4: Human comfort chart and acclimatization	Lecture
	Tue (9-10)	Chapter 4: Human comfort chart and acclimatization	Lecture
	Thu (9-10)	Chapter 4: Human comfort chart and acclimatization	Lecture
8	Sun (9-10)	Chapter 5: Modes of heat transfer for residential buildings	Lecture
	Tue (9-10)	Chapter 5: Modes of heat transfer for residential buildings	Lecture
	Thu (9-10)	Chapter 5: Modes of heat transfer for residential buildings	Lecture
9	Sun (9-10)	Chapter 5: Modes of heat transfer for residential buildings	Lecture
	Tue (9-10)	Chapter 5: Modes of heat transfer for residential buildings	Lecture
	Thu (9-10)	Chapter 5: Modes of heat transfer for residential buildings	Lecture
10	Sun (9-10)	Chapter 6: Heating load calculation	Lecture
	Tue	Chapter 6: Heating load calculation	Lecture

	(9-10)		
	Thu (9-10)	Chapter 6: Heating load calculation	Lecture
11	Sun (9-10)	Chapter 6: Heating load calculation	Lecture
	Tue (9-10)	Chapter 6: Heating load calculation	Lecture
	Thu (9-10)	Second Exam	Exam
12	Sun (9-10)	Chapter 7: Hot water heating system	Lecture
	Tue (9-10)	Chapter 7: Hot water heating system	Lecture
	Thu (9-10)	Chapter 7: Hot water heating system	Lecture
13	Sun (9-10)	Chapter 7: Hot water heating system	Lecture
	Tue (9-10)	Chapter 7: Hot water heating system	Lecture
	Thu (9-10)	Chapter 7: Hot water heating system	Lecture
14	Sun (9-10)	Chapter 9: Cooling load calculation	Lecture
	Tue (9-10)	Chapter 9: Cooling load calculation	Lecture
	Thu (9-10)	Chapter 9: Cooling load calculation	Lecture
15	Sun (9-10)	Chapter 9: Cooling load calculation	Lecture
	Tue (9-10)	Chapter 9: Cooling load calculation	Lecture
	Thu (9-10)	Chapter 10: Warm air heating system	Lecture

10. Grade Distribution:

Assessment	Grade	Date
- First Exam	20%	Fifth Week
- Second Exam	20%	10th Week
- Assignments	10%	
- Final Examination	50%	16th Week

* Make-up exams will be offered for valid reasons. It may be different from regular exams in content and format.