



Philadelphia University

Faculty of Engineering and Technology
Department of Mechanical Engineering

Course Information

Course Title: Air-conditioning (620522)
Prerequisite: Heat transfer (620420)
Credit Hours: 3 credit hours (16 weeks per semester, approximately 44 contact hours)
Textbook: Heating, Ventilation and Air Conditioning ,By: F. C. McQuiston, 6th ed.,

References:

- ASHRAE Handbook, Fundamental Volume, American Society of Heating, Refrigeration and Air-Conditioning Engineers, code 52, 55, 62.1 and 170
- Principles of heating, ventilating, and air conditioning, By: H. J. Sauer, R. H. Howell, and W. J. Coad
- Heating and Air-Conditioning, By: M. Alsaad and M. Hammad
- Air Conditioning Engineering, By W. P. Jones

Course Description: Review of relevant thermodynamics and heat transfer topics; psychometric processes, Design and off design conditions, VAV systems, thermal comfort and indoor air quality, heating load calculations, Solar gain, introduction to HAP software, project

Course requirements: Computer, internet connection, webcam.

Instructor: Dr. Shatha Ammourah
Office: Mechanical Engineering building, room E61308 , ext. : 2219

Course Topics:

week	Basic and support material to be covered
(1)	Moist air properties and conditioning processes
(2)	Moist air properties and conditioning processes
(3)	Moist air properties and conditioning processes
(4)	Comfort and health
(5)	Comfort and health
(6)	Comfort and health

(7)	Heart transmission in buildings structure
(8)	Heart transmission in buildings structure
(9)	Heart transmission in buildings structure
(10)	Space heating load and HAP
(11)	Space heating load and HAP
(12)	Space heating load and HAP
(13)	Solar energy
(14)	Solar energy
(15)	Solar energy
(16)	Final Exam

ABET Student Outcomes (SOs)

1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2	An ability to apply Engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3	An ability to communicate effectively with a range of audiences
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Course Learning Outcomes and Relation to ABET Student Outcomes:

Upon successful completion of this course, a student should be able to:

1	Analyze all air conditioning process and compute the required design values.	1
2	Design all the main air conditioning circuit components accurately.	1,2
3	Understanding the basics of IAQ and design comfortable environment, and	2, 4

	applying ASHREA codes for better environment.	
4	Calculating heating and cooling loads mathematically and by using HAP software	1,2

Teaching methodology: Online, Blended or both

Electronic platform: Microsoft-teams

Evaluation methods:

Evaluation of student's performance (final grade) will be based on the following categories:

Mid-term exam: Shall be given at the end of the seventh week of the course in the form of multiple choice questions and (or) specific problems to be solved and uploaded by the student using the University electronic platform.

Quizzes: A number of 10-minute quizzes in the form of multiple choice questions or an assignment using the University electronic platform. will be given to the students during the semester. These quizzes will cover material discussed during the previous lecture(s).

Homework: Problem sets will be given to students in the form of assignments using the University Electronic platform. Homework should be solved by each student individually and submitted using the platform before the due date.

Copying homework is forbidden, any student caught copying the homework or any part of the homework will receive zero mark for that homework

Participation: Questions will be asked during the online session (lecture) and the student is assessed based on his/her response

Final Exam: The final exam will cover all the class material.

Grading policy:

Mid-term Exam.	30%
Home works, Quizzes and participation	30%
Final Exam	40%
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Total:	100%

Attendance policy:

Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse, acceptable to and approved by the Dean of the relevant college/faculty, shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.