



Philadelphia University
Faculty of Engineering
Department of Mechanical Engineering
Second semester, 2008/2009

Course Syllabus

Course Title: Air-conditioning II	Course code: 620544
Course Level: 5th year	Course prerequisite (s) and/or corequisite (s): Air-conditioning I
Lecture Time: 12:10-13:10 S,T,W	Credit hours: 3

Academic Staff Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Dr. A. Saleh	Assoc. Prof.	61207 Department of Mechanical Engineering	9:00- 11:00	asaleh@philadelphia.edu.jo

Course module description:

This course aims to introduce the methods used to design of air conditioning systems for common buildings. The student is expected to gain knowledge and understanding methods of selecting proper design conditions, calculating the cooling load and designing the air-duct distribution network. The student should be able to perform system component selection and should have a brief knowledge of air processing equipment.

Course module objectives:

A student completing this course should be able to:

- Apply the basic concepts of heat transfer, fluid mechanics and thermodynamics in the design of air conditioning systems.
- Realize local and international design criteria and codes for indoor and outdoor conditions.
- Calculate the cooling load.
- Size the air ducts and calculate the pressure drop in the system.
- Size and select the proper fan and other air conditioning plant components.

Course/ module components

- Books (title , author (s), publisher, year of publication)
 Title: Heating, Ventilation and Air Conditioning
 Author: F. C. McQuiston
 Publisher: J. Wiley
 Edition : 6th, 2005

- **Support material (s) (vcs, acs, etc).**
- **Study guide (s) (if applicable)**
- **Homework and laboratory guide (s) if (applicable).**

Teaching methods:

- 3 Lectures a week
- 2-3 Appointments for tutorials and problem solving after each chapter

Learning outcomes:

- Knowledge and understanding
The student should be able to select the different components of air conditioning systems and to know the different methods followed in designing air conditioning systems.
- Cognitive skills (thinking and analysis).
Some assigned projects aim to develop the thinking and analysis capability of the students
- Communication skills (personal and academic).
Not applicable
- Practical and subject specific skills (Transferable Skills).
Some practical projects assigned aim to develop the practical capability of the students:
It was required to calculate the cooling load of the department building, by using the related software or developing a specific codes for the studied cases.

Assessment instruments

- Short reports and/ or presentations, and/ or Short research projects
- Quizzes.
- Home works
- Final examination: 50 marks

<u>Allocation of Marks</u>	
Assessment Instruments	Mark
Mid examination	25
Final examination: 50 marks	50
Reports, research projects, Quizzes, Home works, Projects	25
Total	100

Documentation and academic honesty

- Documentation style (with illustrative examples)
- Protection by copyright
- Avoiding plagiarism.

Course/module academic calendar

week	Basic and support material to be covered	Homework/reports and their due dates
(1)	Introduction to Air Conditioning Systems	
(2)	Introduction to Air Conditioning Systems	
(3)	Cooling load calculation	
(4)	Cooling load calculation	
(5)	Tutorial and problem solving	Practical application of cooling load method
(6)	Energy calculations and building simulation	
(7)	Tutorial and problem solving	
(8)	Air-diffusion systems	
(9) Mid Examination	Air-diffusion systems	
(10)	Tutorial and problem solving	Selection of air diffusion system
(11)	Air distribution systems (ducts and fans)	
(12)	Air distribution systems (ducts and fans)	
(13)	Tutorial and problem solving	Applications of duct design methods
(14)	Direct contact equipment	
(15)	Tutorial and problem solving	
(16) Final Examination		

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures 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.

Module references

Books

- ASHRAE Handbook, Fundamental Volume, American Society of Heating, Refrigeration and Air-Conditioning Engineers
- 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

Journals

- Journal of Heat Transfer
- Journal of Fluids Engineering Journal of Heat Transfer
- International Journal of Refrigeration

Websites

www.wiley.com/collegge/mcquiston