

1. *Course number and name*  
**ENGR 465: Principles of HVAC**
2. *Credits and contact hours*  
3 credit hours; Three 50-min or two 1-hr, 15-min lectures per week.
3. *Instructor's or course coordinator's name*  
Instructor: Ed Cheng, Associate Professor  
Course coordinator: Ed Cheng, Associate Professor
4. *Text book, title, author, and year*  
F. C. McQuiston, J. D. Parker, and J. D. Spitler. *Heating, Ventilating, and Air Conditioning: Analysis and Design*, 6th edition, John Wiley & Sons, Inc., 2005.
  - a. *other supplemental materials*  
Supplemental documentation for Trance TRACE 700 software.
5. *Specific course information*
  - a. *brief description of the content of the course (catalog description)*  
Air requirements in buildings, heating and cooling load calculation methods and computer software, heating and cooling equipment, flow in pipes and ducts, and clean room technology.
  - b. *prerequisites or co-requisites*  
ENGR 303, ENGR 304.
  - c. *indicate whether a required, elective, or selected elective course in the program*  
Elective for Mechanical Engineering.
6. *Specific goals for the course*
  - a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*
    - The students will demonstrate that they have an understanding of the principles of operation of HVAC systems.
    - The students will demonstrate that they have the ability to calculate the heating and cooling loads for buildings.
    - The students will demonstrate that they have an understanding of the principles and application of psychrometrics.
    - The students will demonstrate the ability to design a basic air distribution system. The
    - The students will demonstrate familiarity with basic issues of indoor air quality.
    - The students will demonstrate their ability to use a common commercial load calculation software to calculate the heating and cooling load of a building
    - The students will demonstrate their skill in written and oral communication by preparing a written report and by making a presentation about their design project.

b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

Course addresses ABET Student Outcome(s): a, c, e, g, h, j, k.

7. *Brief list of topics to be covered*

- Air-Conditioning Systems
- Moist Air Properties and Conditioning Processes
- Comfort and Health – Indoor Environmental Quality
- Heat Transmission in Building Structures
- Solar Radiation
- Space Heating Load
- The Cooling Load
- Energy Calculations