ME 432
Principles of Air Conditioning and Refrigeration


Prerequisites: Thermodynamics, Fluid Mechanics, and Heat Transfer


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Term Project of ME432

Teamwork:

(1) Two (2) students per team or an individual student.
(2) Define each student's role in the project (about 50% each).
(3) Project grade is based on the overall quality of project and each student’s contribution to the project.

Detailed Requirements:

(1) Define your project **(air-conditioning—cooling)**, including:
   i) background and conditions, such as room (location, wall and roof facing direction; window; door); vehicle (window; body material)
   ii) human (number, activity, human comfort condition)
   iii) environmental concern (particulate or gaseous pollutant control)

(20% marks)

(2) Cooling load calculation, including:
   iv) Heat transmission through wall;
   v) Solar radiation through window;
   vi) Infiltration;
   vii) Heat generation, including human factors

(40% marks)

(3) Minimum fresh air requirement based on environmental concern, including
   vii) by-pass factors;
   viii) filter efficiency and location;
   ix) selection of filters with pressure drop consideration

(20% marks)

(4) Air-conditioning unit requirement, including:
   x) return air ratio (based on minimum fresh air required) and mass flow rate;
   xi) cooling coil capacity and SHR;
   xii) compressor capacity with a selected refrigerant (e.g., R134a)

(20% marks)

(5) Energy cost (not required)

(10% mark – bonus – No bonus if overall grade has already reached 100% marks)

F05; Zhu