MIDLAND COLLEGE
SYLLABUS
HART 2445
AIR CONDITIONING SYSTEMS DESIGN
4-0

Course Description:

A study of the properties of air and results of cooling, heating, humidifying or dehumidifying; heat gain and heat loss calculations including equipment selection and balancing the air systems. This course covers psychrometrics and design procedures developed to select proper equipment for air conditioning systems. The student will be introduced to Manual J for heating and cooling loads. The student will also study proper duct sizing techniques.

Text, References, and Supplies:

1. **MANUAL J by ACCA**
2. Industry literature

Course Goals/Objectives:

This course is designed to train an individual to properly size and design the heating, cooling, and duct system for a residential application. Different methods of improving the energy efficiency of the residence will also be covered. The following list of course goals will be addressed in the course. These goals are directly related to the performance objectives. Upon successful completion of the course the student will:
(* designates a CRUCIAL Goal)

1. Display *work habits.*
2. Define *air conditioning*.
*3. Use *"k" factor* heat transfer formula.
*4. Use *"K" factor* heat transfer formula.
*5. Use *"U" factor* heat transfer formula.
6. Determine *dry bulb* temperature.
7. Determine *wet bulb* temperature.
8. Manipulate *sling psychrometer.*
*9. Plot *psychrometric* chart.
10. Calculate *dew point.*
11. Calculate *heat total.*
12. Calculate *pounds of air*.
13. Calculate *relative humidity*.
14. Calculate *specific volume.*

15. Calculate *air moisture content*.
16. Calculate *CFM air volume.*
17. Determine *latent* BTU change.
18. Determine *sensible* BTU change.
*19. Perform Manual J *cooling load calculation*.
20. Calculate *wall* gain.
21. Calculate *appliance* gain.
22. Calculate *people* gain.
23. Calculate *ceiling* gain.
24. Calculate *window and door* gain.
25. Calculate *skylight* gain.
26. Calculate *solar* gain.
27. Calculate *air change* gain.
28. Calculate *duct* gain.
29. Calculate *heat* gain.
30. List *building heat* losses.
31. Calculate *ceiling* losses.
32. Calculate *wall* losses.
33. Calculate *floor* losses.
34. Calculate *window* and *door* losses.
35. Calculate *skylight* loss.
36. Calculate *duct* losses.
37. Determine equipment *heating capacity*.
38. Identify *duct systems.*
*39. Manipulate duct *sizing chart*.
*40. Manipulate *ductulator*.
41. Convert *round duct* to *rectangular duct*.

Student Contributions and Class Policies:

Each student will spend at least 4 hours per week preparing for class. As a student in this course you are expected to display respect, professional behavior, and cooperative attitude at all times. Punctual attendance is critical in this class due to the extent of the material. The college attendance policy will be strictly adhered to. The student is expected to be prepared to work and to participate in all class activities.

Evaluation of Students:

Quizzes and Homework	50%
Attitude and Attendance	20%
Final Exam	30%
Total	100%

Course Schedule:

The class meets for 8 lecture hours per week for 8 weeks

SCANS Information:

The following SCANS skills will be taught and/or reinforced in this course.

ARITHMETIC/MATHEMATICS:

Performs basic computations; uses tables, graphs diagrams and charts to obtain or convey quantitative information. Expresses mathematical ideas and concepts orally and in writing.

PERSONAL QUALITIES:
Displays responsibility, self-esteem, sociability, self management, integrity, and honesty. Chooses ethical courses of action.

Instructor Information:

Jaroy Roberts Instructor
Room 187 TC
(432) 685-4687 Office
(432) 349-5913 cell
E-Mail: jroberts@midland.edu

Office Hours: Posted

Curt Pervier, Applied Technology Dean
Lisa Hays, Applied Technology Secretary
Room 143A TC
(432) 685-4676
Fax: (432)685-6472

Students are encouraged to contact the instructor at any time; however, making an appointment will guarantee the instructor's availability at a specific time.

Americans with Disabilities Act (ADA) Statement:

Midland College provides services for students with disabilities through Student Services. In order to receive accommodations, students must visit www.midland.edu/accommodation and complete the Application for Accommodation Services located under the Apply for Accommodations tab. Services or accommodations are not automatic, each student must apply and be approved to receive them. All documentation submitted will be reviewed and a "Notice of Accommodations" letter will be sent to instructors outlining any reasonable accommodations.

*Students MUST actively participate by completing an academic assignment required by the instructor by the official census date. Students who so not actively participate in an academically-related activity will be reported as never attended and dropped from course.

Midland College Non-Discriminatory Statement:

Midland College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following individuals have been designated to handle inquiries regarding the non-discrimination policies: **Tana Baker, Title IX Coordinator/Compliance Officer, 3600 N. Garfield, SSC 242, Midland, TX 79705, (432) 685-4781, tbaker@midland.edu; Natasha Morgan, Director Human Resources/Payroll, 3600 N. Garfield, PAD 104, Midland, TX 79705, (432) 685-4534, nmorgan@midland.edu.** For further information on notice of non-discrimination, visit **http://wdcrobcolp01.ed.gov/CFAPPS/OCR/contactus.cfm** or call **1 (800) 421-3481**.

Spanish

Midland College no discrimina por motivos de raza, color, nacionalidad, sexo, discapacidad, o edad en sus programas o actividades. Las siguientes personas han sido designadas para responder a cualquier pregunta o duda sobre estas políticas no discriminatorias: **Tana Baker, Title IX Coordinator/Compliance Officer, 3600 N. Garfield, SSC 242, Midland, TX 79705, (432) 685-4781, tbaker@midland.edu; Natasha Morgan, Director Human Resources/Payroll, 3600 N. Garfield, PAD 104, Midland, TX 79705, (432) 685-4534, nmorgan@midland.edu.** Para más información sobre estas políticas no discriminatorias , visite **http://wdcrobcolp01.ed.gov/CFAPPS/OCR/contactus.cfm** o llame al 1 (800) 421-3481.