MIDLAND COLLEGE
SYLLABUS
HART 2445
AIR CONDITIONING SYSTEMS DESIGN
3-1

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:

Lab	40%
Quizzes & Homework	15%
Attitude & Attendance	20%
Final Examination	25%
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.

Program Information:

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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)

Any student who, because of a disabling condition, may require some special arrangements to meet course requirements should contact disabilities support services as soon as possible at: Accommodation Services. Conditions may include documented physical or educational disabilities. Please be aware that services or accommodations are not automatic. Each student must request them and secure the proper authorizations/documentation. Accessibility Links can be found on the Pages tab in Canvas.

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. For information and inquiries regarding Midland College's non-discrimination policies, go to: Title IX For further information on notice of non-discrimination, visit the ED.gov Office of Civil Rights website, or call 1 (800) 421-3481.

Syllabus subject to change as deemed necessary by the instructor to ensure learning objectives and course goals are met