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.
15. Calculate air moisture content.
16. Calculate CFM air volume.
17. Determine latent BTU change.
18. Determine sensible BTU change.
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.
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.
*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:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes and Homework</td>
<td>50%</td>
</tr>
<tr>
<td>Attitude and Attendance</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Course Schedule:

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

Last Updated 12/16/2016
AMERICANS WITH DISABILITIES ACT (ADA):

Any student who, because of a disabling condition, may require some special arrangements in order to meet course requirements should contact Shep Grinnan as soon as possible. Mr. Grinnan’s office is located in the Scharbauer Student Center Building. These 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.

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 Tanner, 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.