Course Description: An introduction to the refrigeration cycle, basic thermodynamics, heat transfer, temperature/pressure relationship, safety, refrigeration containment, metering devices, and refrigeration components. The student will learn proper soldering and brazing techniques using oxy-acetylene and air-acetylene. The student will also be introduced to the proper use of hand tools and test instruments required in both service and installation. This course and HART 1401 must be taken first as the prerequisite to all the HART classes.

2. REFRIGERATION AND AIR CONDITIONING TECHNOLOGY LAB MANUAL, Whitman & Johnson.
3. Industry Literature

Course Goals/Objectives: This class is designed to teach basic skills necessary for a service person in the air conditioning and refrigeration industry. 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. Develop safe work habits.
2. Display work habits.
3. Maintain a clean and orderly shop.
4. Define British Thermal Unit.
5. Define latent heat.
6. Define refrigeration ton.
7. Define sensible heat.
8. Define specific heat.
9. Convert area measurements.
11. Calculate cubic volume.
12. Calculate cylinder volume.
13. Calculate latent heat.
15. Make a proper flare fitting.
16. Make a swaging tool joint.
17. Demonstrate air acetylene torch operation.
18. Demonstrate proper oxygen and acetylene torch usage.
   *19. Demonstrate tubing bender operation.
20. Solder copper tube using sil-fos.
22. Solder copper tube using 6% stay brite soft solder.
23. Identify the four main refrigeration system components.
24. List the seven steps of the refrigeration cycle.
25. Display P/T chart knowledge.
26. Explain capillary tube operation.
27. Demonstrate a halide torch leak test.
28. Demonstrate a soap bubble leak test.
29. Demonstrate an electronic leak-detector leak test.
30. Demonstrate manifold gauge operation.
31. Demonstrate service manifold standing pressure test.
32. Demonstrate vacuum pump operation.
33. Explain refrigeration service valve operation.
34. Explain AEV valve operation.
35. Convert a capillary system to an AEV system.
36. Adjust a low pressure control.
37. Demonstrate the dial-a-charge charging procedure.
38. Measure superheat.
40. Explain TXV valve operation.
41. Explain EPR valve operation.
42. Explain CPR valve function.
43. Explain CPR valve operation.
44. Explain winterizing valve operation.
45. Explain hot gas bypass valve operation.

**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 a 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>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>30%</td>
</tr>
<tr>
<td>Quizzes &amp; Homework</td>
<td>25%</td>
</tr>
<tr>
<td>Attitude &amp; Attendance</td>
<td>20%</td>
</tr>
<tr>
<td>Final Examination</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Course schedule: The class meets for 6 lecture hours and 6 lab hours per week for 8 weeks.

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

**INTERPERSONAL:**
Works with others. Works cooperatively with others and contributes to the group with ideas, suggestions, and effort. Helps others learn.

**INFORMATION:**
Acquires, evaluates, interprets and communicates information. Uses computers to acquire and communicate information.

**TECHNOLOGY:**
Chooses procedures, tools or equipment including computers and related technologies. Prevents, identifies, or solves problems with equipment.

**WRITING:**
Communicates thoughts, ideas, information, and messages in writing; records information completely, and accurately; creates graphs, reports and charts.

Safety Glasses Policy: It is required that all persons in the Air Conditioning Program wear eye protection while in the lab. Students are required to furnish their own protection. Visitors will be supplied with a pair of glasses to be used during their visit. If you have any questions about this policy, please ask your instructor to clarify them for you.
Instructor Information: Jaroy Roberts  
Room 187TC  
(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 Division Secretary  
(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.  

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

Students with Disabilities  

Midland College provides services for students with disabilities through Student Services. In order to receive accommodations, students must place documentation on file with the Counselor/Disability Specialist. Students with disabilities should notify Midland College prior to the beginning of each semester. Student Services will provide each student with a letter outlining any reasonable accommodations. The student must present the letter to the instructor at the beginning of the semester.  

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://wdcrdobc1p01.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.