Course Description: Components, applications, and installation of mechanical air conditioning systems including operating conditions, troubleshooting, repair, and charging of air conditioning systems. This course covers proper recovery, recycle, and reclaim procedures. The student will also study the chemical make-up of refrigerants and how they affect the atmosphere. Replacement refrigerants and the problems they pose will also be covered. The student will gain a working knowledge of the various components used in air conditioning and refrigeration systems. The student will study various refrigerant oils and the type refrigerants they are designed for. Prerequisites: HART 1401 and HART 1407 or consent of instructor.

Text, References, and Supplies:

3. Industry Literature

Course Goals/Objectives: This course is designed to inform the student of the affects of refrigerants on our atmosphere and the things our industry is doing to compensate for those effects. The class also discusses the various components in the system and how they can be used to improve the operation and efficiency of the system. The following list of course goals will be addressed in the course. These goals are directly related to the performance objectives.

(* designates a CRUCIAL Goal)

*1. Display work habits.
2. Display correct recovery system procedure.
3. Display correct recycle system procedure.
4. Display knowledge of refrigerant classification.
5. Display knowledge of ozone depletion theory.
6. Exhibit Clean Air Act knowledge.
7. List azeotropic refrigerant properties.
8. List desirable refrigerant characteristics.
9. List three leak detection methods.
10. List refrigerant blend properties.
*11. Match refrigerants and their cylinder color.
12. Compare existing and replacement refrigerants.
13. Describe refrigeration conversion procedures.
14. Recover refrigerant from system.
15. Examine alkylbezene oil properties.
16. Examine polyolester oil properties.
17. Explain oil-refrigerant migration problems.
18. Select correct refrigeration system oil.
19. Compare compressor tonnage to horsepower.
20. Identify compressor components.
22. Describe compressor oil pump operation.
23. Describe compressor reed valve operation.
24. Describe discus valve operation.
25. Describe scroll compressor operation.
26. Explain rotary compressor operation.
27. Compare relative humidity and evaporator TD.
28. Analyze evaporator construction.
29. Develop evaporator design knowledge
30. Examine evaporator fin spacing.
31. Measure evaporator temperature drop.
32. Compare evaporator load to condenser load.
33. Examine refrigerant sight glasses.
34. Identify system components.
35. Describe water regulating valve operation.
36. Describe heat exchanger operation.
37. Describe discharge line muffler operation.
38. Describe crankcase heater operation.
39. Describe oil separator operation.
40. Analyze refrigerant driers.
41. Analyze suction refrigerant driers.
42. Describe refrigerant accumulator operation.
43. Describe refrigerant receiver operation.
44. Recall winterizing valve function.
45. Recall CPR valve function.
46. Recall EPR valve function.
47. Recall hot gas by-pass valve function.
48. Show system pump down procedure.
49. Charge system using charging cylinder.
50. Charge system using scales.
51. Demonstrate manufacturer’s charging procedure.
Student Contributions and Class Policies:

Each student will spend at least 4 hours per week preparing for class. As a student in this class you are expected to display respect, professional behavior and a cooperative attitude at all times. Punctual attendance is critical in this class. This course will focus on the basic skills needed to perform in the field as a beginning service technician.

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>Total</td>
<td>100%</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.

RESOURCES:
Identifies, organizes, plans, and allocates resources. Selects relevant, goal-related activities, ranks them in order of importance, allocates time to activities, and understands, prepares and follows schedules.

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.

READING:
Locates, understands, and interprets written information—including manuals, graphs, and schedules to perform tasks. Infers or locates the meaning of unknown or technical vocabulary.

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

Office Hours: Posted

Curt Pervier, Technical Studies Dean
Lisa Hays, Applied Technology Division 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.

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://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.
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*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.