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:
1. Modern Refrigeration and Air Conditioning With E resources from book store
2. 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>Weight</th>
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<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.

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.

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