MIDLAND COLLEGE
SYLLABUS
HART 1441
RESIDENTIAL AIR CONDITIONING
3-3

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. **REFRIGERATION AND AIR CONDITIONING TECHNOLOGY**, Whitman and Johnson. Current Edition.
2. **REFRIGERATION AND AIR CONDITIONING TECHNOLOGY LAB MANUAL**, Whitman and Johnson. Current Edition.
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*.
21. Explain *compressor clearance volume*.
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:

Lab	30%
Quizzes & Homework	25%
Attitude & Attendance	20%
Final Examination	25%
Total	100%

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, Applied Technology 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.

Americans with Disabilities Act (ADA) Statement:

Midland College provides services for students with disabilities through Student Services. In order to receive accommodations, students must visit www.midland.edu/accommodation and complete the Application for Accommodation Services located under the Apply for Accommodations tab. Services or accommodations are not automatic, each student must apply and be approved to receive them. All documentation submitted will be reviewed and a "Notice of Accommodations" letter will be sent to instructors outlining any reasonable accommodations.

Midland College Non-Discriminatory Statement:

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Spanish

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