SYLLABUS

DATE OF LAST REVIEW: 02/2013
CIP CODE: 47.0201
SEMESTER: Departmental Syllabus
COURSE TITLE: System Servicing and Troubleshooting
COURSE NUMBER: HVAC0204
CREDIT HOURS: 2
INSTRUCTOR: Departmental Syllabus
OFFICE LOCATION: Departmental Syllabus
OFFICE HOURS: Departmental Syllabus
TELEPHONE: Departmental Syllabus
EMAIL: KCKCC issued email accounts are the official means for electronically communicating with our students.

PREREQUISITE(S): General Safety. Math Level 3 Recommended

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, http://www.kckccbookstore.com/, for the required texts for your particular class.

COURSE DESCRIPTION:
This course will cover the fundamentals of system servicing and troubleshooting. This will include air conditioning, all weather systems, centrifugal fan, complex circuits, controls, electric motors, four-way valves, gas furnaces, humidifiers, ice makers, output voltage transformers, pilot safety switches, refrigeration systems, and thermocouples.

METHOD OF INSTRUCTION:
A variety of instructional methods may be used depending on content area. They may include but are not limited to lecture, multimedia, cooperative/collaborative learning, demonstrations, labs, on-the-job, internships, and other learning experiences outside the classroom. Methodology will be selected to best meet student needs.
COURSE OUTLINE:
I. Troubleshooting
   A. Air Conditioning
      1. Mechanical Troubleshooting
      2. Gas Manifold Usage
      3. When to Connect the Gages
      4. Low Side Gage Readings
      5. High Side Gage Readings
      6. Temperature Readings
         a. Inlet air temperatures
         b. Evaporator outlet temperatures
      7. Suction line temperatures
         a. Discharge line temperatures
         b. Liquid line temperatures
   II. Electrical Motors
      A. Electrical Motor Troubleshooting
      B. Mechanical Motor Problems
      C. Troubleshooting Hermetic Motors
   III. Commercial Refrigeration
      A. Organized Troubleshooting
      B. Troubleshooting Temperature Applications
   IV. Troubleshooting Gas Heat

EXPECTED LEARNER OUTCOMES:
A. The student will be able to demonstrate an understanding of the correct instruments for checking an air conditioning unit with a mechanical problem.
B. The student will be able to demonstrate the ability to select the correct instruments to troubleshoot electrical problems in an air conditioning system.
C. The student will be able to demonstrate the ability to check the line and low voltage power supplies.
D. The student will be able to demonstrate the ability to diagnose an inefficient compressor.

COURSE COMPETENCIES:
Upon successful completion of this course:

The student will be able to demonstrate an understanding of the correct instruments for checking an air conditioning unit with a mechanical problem.

1. The student will be able to demonstrate the proper use of the gage manifold, indicates the low and high pressures.
2. The student will be able to demonstrate proper use of the Schrader valve and the service valve.
3. The student will be able to demonstrate proper use of the four-lead electronic thermometer when taken temperature readings.
4. The student will be able to demonstrate using a volt-ohm-meter.
5. The student will be able to demonstrate using a clamp-on ammeter for checking amps draws.
6. The student will be able to demonstrate the use of mega-ohm meter for checking motor windings.
7. The student will be able to explain the purpose of refrigerant oil for motor lubrication.

The student will be able to demonstrate the ability to select the correct instruments to troubleshoot electrical problems in an air conditioning system.

8. The student will be able to demonstrate the volt-ohm-meter.
9. The student will be able to demonstrate the mega ohm meter can be used to verify if the windings in the compressor are good.
10. The student will be able to demonstrate the volt-alert meter can be used to detect if voltages are present in the system.
11. The student will be able to demonstrate the clamp-on ammeter for checking amp-draw on a motor.
12. The student will be able to demonstrate the use of an infra-red thermometer for excessive heat.
13. The student will be able to explain knowledge of ohms-law.
14. The student will be able to explain knowledge of a data-recorder for recording voltages changes.

The student will be able to demonstrate the ability to check the line and low voltage power supplies.

15. The student will be able to demonstrate the volt meter can be used to detect the line voltages of 120 or 240 volts.
16. The student will be able to demonstrate the amp-meter can be used to detect the amperage in the line voltages.
17. The student will be able to demonstrate safety practices should be follow when working around line voltages.
18. The student will be able to demonstrate the volt meter can also be used to detect the low voltage (control voltage).
19. The student will be able to explain the knowledge of electrical polarity.
20. The student will be able to explain the relationship of voltage and amperage.
21. The student will be able to demonstrate the proper use of the volt-meter leads.

The student will be able to demonstrate the ability to diagnose an inefficient compressor.

22. The student will be able to demonstrate the compressor comes on and turns off repeatedly.
23. The student will be able to demonstrate the compressor is excessive hot to the touch
24. The student will be able to demonstrate the dome of the compressor is sweating (too much refrigerant)
25. The student will be able to demonstrate the compressor has high lock rotor amps. (LRA).
26. The student will be able to demonstrate the pressures are equalized between the high and low side of the system.
27. The student will be able to explain the state of refrigerant passing through the compressor.
28. The student will be able to explain the compressor ratio efficiency.

ASSESSMENT OF LEARNER OUTCOMES:
Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.

SPECIAL NOTES:
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

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