DATE OF LAST REVIEW: 02/2013

CIP CODE: 47.0201

SEMESTER: Departmental Syllabus

COURSE TITLE: Refrigeration 2

COURSE NUMBER: HVAC0229

CREDIT HOURS: 3

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.

PREREQUISITES: HVAC0101


COURSE DESCRIPTION:
This course will introduce students to domestic and commercial refrigeration. The course will discuss compressors, condensers, and metering devices. Wiring and controls, defrost cycle, sweat prevention heaters, fan motors, and ice makers will also be covered.

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. Special Refrigeration Application
   A. Transport Refrigeration
   B. Truck Refrigeration Systems
   C. Railway Refrigeration
   D. Cascade Systems
II. Troubleshooting and Typical Operating Conditions for Commercial Refrigeration.
   A. Organized Troubleshooting
   B. Calculating the Correct Head Pressure for Air Cooled Equipment
   C. Six Typical Problems
      1. Low Refrigerant Charge
      2. Excess refrigerant charge
      3. Inefficient evaporator
      4. Inefficient condenser
      5. Inefficient compressor

EXPECTED LEARNER OUTCOMES:
A. The student will be able to demonstrate an understanding of basic refrigerated air dry unit operation.
B. The student will be able to demonstrate an understanding of the methods used in refrigerating trucks.
C. The student will be able to demonstrate an understanding of cascade refrigeration.
D. The student will be able to diagnose an inefficient evaporator.
E. The student will be able to diagnose an inefficient condenser.
F. The student will be able to diagnose an inefficient compressor.

COURSE COMPETENCIES:
Upon successful completion of this course:

The student will be able to demonstrate an understanding of basic refrigerated air dry unit operation.
1. The student will be able to explain that refrigerated air dryers are basically refrigeration systems located in the air supply, after the storage tank. The air may be cooled in a heat exchanger, then moved to the storage tank where much of the water will separate from the air.

The student will be able to demonstrate an understanding of the methods used in refrigerating trucks.
2. The student will be able to explain that transport refrigeration is the process of refrigerating products while they are being transported from one place to another. This can be by truck, rail, air, or water.

The student will be able to explain the types of truck refrigeration are:
3. The student will be able to explain Dry Ice
4. The student will be able to describe Ice
5. The student will be able to explain Liquid nitrogen
6. The student will be able to explain Carbon dioxide (CO2)

The student will be able to demonstrate an understanding of cascade refrigeration.
7. The student will be able to explain a system with operating temperatures down to about -160 degrees F using the compression cycle may use a system called cascade refrigeration.
8. The student will be able to explain the cascade refrigeration uses two or three stages of refrigeration, depending on how low the lower temperature range may need to be.
9. The student will be able to explain that this is accomplished when the condenser of one stage exchanges heat with the evaporator in another stage. The condenser rejects heat from the system and the evaporator absorbs heat into the system.

The student will be able to diagnose an inefficient evaporator.
10. The student will be able to demonstrate an inefficient evaporator does not absorb the heat into the system and will have a low suction pressure.

The student will be able to explain the causes of an inefficient evaporator:
11. The student will be able to demonstrate a dirty coil.
12. The student will be able to demonstrate an fan running too slow.
13. The student will be able to explain an expansion valve starving the coil
14. The student will be able to explain recirculated air.
15. The student will be able to demonstrate ice buildup
16. The student will be able to demonstrate block air flow.

The student will be able to diagnose an inefficient condenser.
17. The student will be able to demonstrate a condenser unable to De-superheat the hot gas from the compressor.
18. The student will be able to demonstrate a condenser unable to condense the refrigerant
19. The student will be able to demonstrate a condenser unable to sub-cool the refrigerant before it leaves the coil.

The student will be able to diagnose an inefficient compressor.
20. The student will be able to demonstrate a compressor pumping at less than capacity.
21. The student will be able to demonstrate a compressor unable to pump vapor refrigerant.
22. The student will be able to demonstrate a compressor valves: bent, crack, or warped.
23. The student will be able to demonstrate a compressor overheats.

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.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college’s policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the Director of the Academic Resource Center at (913) 288-7670 V/TDD.