SYLLABUS

DATE OF LAST REVIEW: 02/2013

CIP CODE: 47.0201

SEMESTER: Departmental Syllabus

COURSE TITLE: R-410A Safety Certification (Green Technology)

COURSE NUMBER: HVAC0221

CREDIT HOURS: 1

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): None

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 is written on the belief that the solution to transition to environmentally safer refrigerants and oils, while keeping the public and technicians out of harms way, is education and training. This certification program was written to assist in the training and certification of HVACR technicians for proper safety, handling and application of R-410A refrigerant.

METHOD OF INSTRUCTION: A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:
I. Introduction to the R-410A and the R-22 Phase-Out
   A. Background
   B. HCFC Phase-out Schedule
C. Regulation and Change
D. Safety and R-410A

II. Introduction to Refrigeration and Air Conditioning Systems Fundamentals
A. Vapor Compression Refrigeration System
B. Condensing Pressure
C. Evaporating Pressure
D. Refrigerant States and Conditions

III. The study of Refrigerant Chemistry and Applications
A. CFC’s, HCFC’s and HFC’s
B. Blends
C. Blend Temperature Glide

IV. The use of Refrigeration Oils and Their Applications
A. Oil Groups
B. Synthetic Oils
C. Alkylbenzene
D. Glycols
E. Esters
F. Waste Oils

V. The application of Safety
A. Personal Safety Protection
B. Electrical Safety
C. Safe Refrigerant Handling
D. Storage Cylinders

EXPECTED LEARNER OUTCOMES:
A. The student will be able to describe condensing and evaporating pressure.
B. The student will be able to explain the liquid and vapor states of refrigerants.
C. The student will be able to describe a superheated vapor and a subcooled liquid.
D. The student will be able to list the components of the basic vapor compression system.

COURSE COMPETENCIES:
Upon successful completion of this course:

The student will be able to describe the condensing and evaporating pressure.

1. The student will be able to describe why the condensing pressure is higher than the evaporating pressure.

The student will be able to explain the liquid and vapor states of refrigerants.

2. The student will be able to explain liquid refrigerant in the condensing side of the system.
3. The student will be able to explain vapor refrigerant in the evaporator side of the system.

The student will be able to describe a superheated vapor and a subcooled liquid.

4. The student will be able to describe superheated vapor as heat added past the saturation point.
5. The student will be able to describe subcooled liquid as liquid refrigerant cooled below
the condensing point.

_The student will be able to list the components of the basic vapor compression system._

6. The student will be able to list the components of the basic vapor compression system: Compressor, Evaporator, Condenser, Metering Device.

7. The student will demonstrate application of all applicable components of EPA Section 608 for fixed equipment.

**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.