# 7/28/2020

# brcc keystone logo

Baton Rouge Community College

*Academic Affairs Master Syllabus*

Date Approved: 2 August 2020

Term and Year of Implementation: Fall 2020

**Course Title:** Principles of Refrigeration

**BRCC Course Rubric:** HACR 1229

**Previous Course Rubric**: HACR 1160, HACR 1170, and HACR 1180

**Lecture Hours per week-Lab Hours per week-Credit Hours**: 1-16-9

**Per semester: Lecture Hours-Lab Hours-Instructional Contact Hours**: 15-240-255

**Louisiana Common Course Number:**

**CIP Code:** 47.0201

**Course Description:** Includes the proper and safe use of hand tools, power tools, and materials in the heating, ventilation, and air conditioning (HVAC) industry and a review of refrigeration processes and applications. Provides the student with the skills and knowledge to install, repair, and service major components of a refrigeration system. Topics include compressors, evaporators, condensers, metering devices, service procedures, refrigeration systems, and safety. Students will be eligible to complete the EPA Section 608 certification test.

**Prerequisites:** HACR 1113, HACR 1123, HACR 1133, HACR 1143, and HACR 1213, with a grade of C or better

**Co-requisites:** HACR 1234 and HACR 1245

**Suggested Enrollment Cap:** 20

**Learning Outcomes.** *Upon successful completion of this course, the students will be able to:*

1. Explain the function of the major components of a refrigeration system.

2. Demonstrate the ability to install, repair, and service major components of a refrigeration system.

3. Explain the core principles of the Environmental Protection Agency (EPA) Section 608 certification.

4. Explain the recovery requirements of EPA Section 608 Type 1, Type2, and Type 3 equipment.

5. Demonstrate adherence to safety precautions and safe work practices.

**Assessment Measures.** Assessment of all learning outcomes will be measured using the following methods:

1. Assessment measures may include, but are not limited to, presentations, collaborative projects, in-class activities, field reports, homework, quizzes, and exams.

**Information to be included on the Instructor’s Course Syllabi:**

* ***Disability Statement*:** Baton Rouge Community College seeks to meet the needs of its students in many ways. See the Office of Disability Services to receive suggestions for disability statements that should be included in each syllabus.
* ***Grading:*** The College grading policy should be included in the course syllabus. Any special practices should also go here. This should include the instructor’s and/or the department’s policy for make-up work. For example in a speech course, “Speeches not given on due date will receive no grade higher than a sixty” or “Make-up work will not be accepted after the last day of class”.
* ***Attendance Policy*:** Include the overall attendance policy of the college. Instructors may want to add additional information in individual syllabi to meet the needs of their courses.
* ***General Policies*:** Instructors’ policy on the use of things such as beepers and cell phones and/or hand held programmable calculators should be covered in this section.
* ***Cheating and Plagiarism*:** This must be included in all syllabi and should include the penalties for incidents in a given class. Students should have a clear idea of what constitutes cheating in a given course.
* ***Safety Concerns:*** In some courses, this may be a major issue. For example, “No student will be allowed in the lab without safety glasses”. General statements such as, “Items that may be harmful to one’s self or others should not be brought to class”.
* ***Library/ Learning Resources:*** Since the development of the total person is part of our mission, assignments in the library and/or the Learning Resources Center should be included to assist students in enhancing skills and in using resources. Students should be encouraged to use the library for reading enjoyment as part of lifelong learning.

**Expanded Course Outline:**

1. Equipment used in the refrigeration industry

2. Materials used in the refrigeration industry

3. Tools used in the refrigeration industry

4. The manipulation of copper tubing: cutting, swaging, flaring, and bending (180, 90, and 45 degree bends)

5. The set-up and safe use an air acetylene torch

6. The set-up and safe use an oxyacetylene torch set

7. Soldering and brazing techniques

8. Joining pipe and copper tubing

9. Basic laws of heating and cooling

10. Basic principles of refrigeration

11. Reading refrigeration gauges

12. Compressors

13. Condensers and receivers

14. Evaporators

15. Thermostatic and automatic expansion valves

16. Fixed bore metering devices

17. Refrigeration system accessories

18. EPA 608 regulations for Technician Certification

19. Refrigerant recovery, recycling, and reclamation

20. Methods for charging refrigeration systems, using the sub cooling method, superheat method, pressure/temperature and amperage method and weight method.

21. Installing manifold gauges on a system

22. Review: basic laws of heating and cooling

23. Review: basic principles of refrigeration

24. Reading refrigeration gauges in conjunction with a vacuum pump

25. Proper usage of a refrigerant recovery machine

26. Core principles of the EPA Section 608 certification

27. Recovery requirement of EPA Section 608 Type 1 equipment

28. Recovery requirement of EPA Section 608 Type 2 equipment

29. Recovery requirement of EPA Section 608 Type 3 equipment

30. Recovering, evacuating, and recharging a refrigeration system

31. The EPA Section 608 certification test