

**NORTHEAST COMMUNITY COLLEGE
COURSE SYLLABUS**

**HVAC 2310
COMMERCIAL AIR CONDITIONING AND REFRIGERATION**

SPRING 2015

NORTHEAST COMMUNITY COLLEGE

COMMERCIAL AIR CONDITIONING AND REFRIGERATION

COURSE SYLLABUS

I. CATALOG DESCRIPTION:

COURSE NUMBER: HVAC 2310

COURSE TITLE: Commercial Air Conditioning and Refrigeration

PRE-REQUISITES: HVAC 2110

CO-REQUISITES: None

DESCRIPTION: Refrigeration pipe sizing, installation and soldering for a complete system layout with the necessary calculations. Various aspects of employer-employee relationships and responsibilities. (45/0/0/0)

CREDIT/CONTACT HOUR DESIGNATION:

Credits: 3 Lecture: 45 Lab: 0 Clinical: 0 Coop: 0

TERM: Spring 2015

II. COURSE OBJECTIVES:

Course will:

1. Explore commercial refrigeration theory.
2. Introduce the math needed to determine pipe sizing and other related calculations.
3. Build and understanding of refrigerant handling
4. Demonstrate proper procedures in installing, designing, and troubleshooting commercial air conditioning and refrigeration systems.

III. STUDENT LEARNING OUTCOMES:

The student will be able to:

1. Describe the electrical motor controls that apply to commercial refrigeration.
2. Explain retrofitting CFC refrigeration systems.
3. Describe start up and system charging.
4. Explain refrigerant recovery procedures.
5. Describe Parallel rack systems.
6. Discuss heat reclaim.
7. Explain Walk in box application.
8. Describe refrigeration piping practices.
9. Describe package versus remote-condensing applications.
10. Describe ice-making equipment.

11. Describe refrigeration maintenance program.
12. List the typical operating temperatures and pressures for the low- pressure side of a refrigeration system for high, medium, and low temperatures.
13. Troubleshoot and recognize typical operating conditions for commercial refrigeration systems.*

*These course objectives are directed toward meeting the Fundamental Academic Competencies and Skills (FACS).

IV. CONTENT/TOPICAL OUTLINE:

- A. Commercial Refrigeration Textbook
 1. Chapter 6: Controls and Accessories
 2. Chapter 7: Refrigeration System Troubleshooting
 3. Chapter 8: Compressor Motor Controls
 4. Chapter 9: Retrofitting, Recovery, Evacuation, and Charging
 5. Chapter 10: Supermarket Refrigeration
 6. Chapter 11: Walk-in Refrigerators and Freezers
 7. Chapter 12: Ice Machines
 8. Chapter 13: Product Temperatures for Preservation and Health
 9. Chapter 14: Refrigeration Business Tips

V. INSTRUCTIONAL MATERIALS:

- A. Required Text:
 1. Commercial Refrigeration for Air Conditioning Technicians; 2nd Ed.
Editor: Dick Wirz
ISBN-10: 1-4283-3526-9
- B. Required Materials
 1. Notebook
 2. Pens/Pencil
 3. Calculator
 4. Safety Glasses

VI. METHOD OF PRESENTATION:

- A. Methods of presentation typically include a combination of the following:
 1. Handouts
 2. Multimedia presentations
 3. Independent study
 4. Formal and informal lectures
 5. Demonstrations

VII. METHOD OF EVALUATION:

- A. Methods of evaluation typically include a combination of the following:

1. Class participation (attendance and engagement)
2. Tests/quizzes
3. Assignments

B. Grading Rubric:

Tests	60%
Quizzes/Assignments	40%

C. Grading Scale:

95 - 100	A+
90 - 94	A
85 - 89	B+
80 - 84	B
75 - 79	C+
70 - 74	C
65 - 69	D+
60 - 64	D
Below 60	F

VIII. COURSE REQUIREMENTS:

A. Attendance

1. Students are expected to attend class. Missed quizzes/assignments cannot be made up unless approved by the instructor. If you cannot attend class, see or call instructor (phone number 402-844-7230). Your grade will start dropping by a letter grade for each day after three days.

B. Student Conduct

1. Students will also be expected to conform to the Student Code of Conduct.

IX. SUPPORT SERVICES:

A. **Library Service:**

The Northeast Community College Library Resource Center provides students with tools to conduct scholarly research and increase knowledge. Through the library's subscription databases, students have access to millions of current and credible resources not available through Google, Yahoo, and other search engines. Links to online databases and the library's online catalog can be found at <http://www.northeast.edu/Library-Resources/>. Students who would like assistance in utilizing the library's resources are encouraged to contact the library for further information and personal service at 402-844-7131 or email marylouise@northeast.edu.

B. **Disabilities:**

Students with a documented disability may be eligible for certain accommodations that support their success in the classroom. Please contact Mary Balaski, Disability

Services Coordinator, for further information. Her office is located in CWC- 1263; also, she may be reached at 402-844-7343 or mary@northeast.edu.

C. Applied Technology Division Safety Statement

Through the course of the semester you will be working with and around equipment that can be dangerous. The inherent dangers include both kinetic and potential energy; examples include, but are not limited to, high voltages, rotating equipment, high pressure hydraulics, compressed air, items that are heavy and/or hot, and the risk of fall or shock. Every effort has been made to minimize these risks and you will receive instruction and training as a part of this course (and related courses) in the proper safety procedures and equipment operation protocols. If you have a health condition or physical limitation that may affect you or another student's safety, you are to consult with the instructor prior to beginning to work with the equipment or undertaking a task involving the equipment. It is the student's responsibility to be able to follow all safety procedures and equipment operation protocols. Failure to abide by safety practices, procedures, or equipment protocols could result in serious injury or death. Failure to follow these safety practices / procedures or equipment protocols will not be tolerated and the student could face student disciplinary action including reduction of grade and possible removal from the course. Removal from the course could also result in loss of credit for the course and affect a student's financial aid.

X. INSTRUCTOR NAME AND CONTACT INFORMATION:

Instructor: Mr. Paul Bailey

Office: Weller 128

Office Phone: 402-844-7230

Home Phone: 402-371-0394 (after 5:00pm)

Email: paulb@northeast.edu

Office Hours: Monday – Thursday 7:00am – 7:15am, 11:15am – 12:30pm



Unless otherwise noted, this work by the [trans*IT](#) Nebraska Community College Consortium is licensed under the [Creative Commons Attribution 4.0 International License](#). To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

This product was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.