

**NORTHEAST COMMUNITY COLLEGE
COURSE SYLLABUS**

**HVAC 2010
HEATING TECHNOLOGY**

FALL 2015

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HEATING TECHNOLOGY
COURSE SYLLABUS**

I. CATALOG DESCRIPTION:

COURSE NUMBER: HVAC 2010

COURSE TITLE: Heating Technology

PRE-REQUISITES: HVAC 1210; HVAC 1220; HVAC 1250; HVAC 1260

CO-REQUISITES: None

DESCRIPTION: A study of the procedures used in servicing heating systems including gas fired and electric furnaces, including the combustion process in conventional and high efficiency heating appliances for residential and light commercial applications.

CREDIT/CONTACT HOUR DESIGNATION:

Credits: 2.5 Lecture: 37.5 Lab: 0 Clinical: 0 Coop: 0

TERM: Fall 2015

II. COURSE OBJECTIVES:

Course will:

1. Explain the basic principles of combustion process.
2. Identify the basic components of a forced air system.
3. Define the difference between a conventional and a high-efficiency furnace.
4. Identify the three types of ignition systems.
5. Explain furnace sequence of operation.
6. Differentiate between good installation practices and poor practices.
7. Explain proper start up procedures on new installations.
8. Provide real world examples of troubleshooting procedures.
9. Identify principles of electric heating.
10. Identify several instruments used to determine air flow, pressures, temperatures and electrical readings on heating appliance.
11. Explain proper gas piping practices.
12. Explain the venting categories listed by (ANSI).

III. STUDENT LEARNING OUTCOMES:

The student will be able to:

1. Recognize good installation practices for package and split system heating and air conditioning equipment.
2. State start up procedures for residential heating and air conditioning equipment.
3. Describe the control sequence for a residential heating system.
4. Establish reference points when working on unfamiliar equipment in order to know what the typical conditions should be.*
5. Determine the difference between mechanical and electrical problems.*
6. Perform basic test in troubleshooting electrical problems in an electric forced-air furnace.*
7. Describe each of the major components of a gas furnace and troubleshooting the combustion process.*
8. Identify the types of ignition and flame safety circuits.
9. Measure proper air flow using instruments to determine CFM.
10. Read and adjust gas pressures using a manometer.
11. Describe the common venting categories used in Industry.

*Student learning outcomes address goals established for the Fundamental Academic Competencies and Skills (FACS) in communication, social and cultural awareness, and critical thinking/problem solving.

IV. CONTENT/TOPICAL OUTLINE:

A. Refrigeration Technology 6th Ed.:

1. Safety training review
2. Unit 15: Troubleshooting basic controls
3. Unit 30: Electric Heat with handouts
4. Unit 31: Gas Heat with handouts
5. Unit 32: Oil Heat

Assigned wiring schematics

B. Heating, Ventilation and Air Conditioning Text & Lab Book

1. Chapters 5 and 5: Oil and Gas Heat
2. Theory Lessons: 131-150 Oil Heat, page 703
3. Theory Lessons: 151-164 Gas Heat, page 809

V. INSTRUCTIONAL MATERIALS:

A. Required Text:

1. Refrigeration & Air Conditioning Technology; 7th Ed.
Authors: Whitman and Johnson
2. Refrigeration & Air Conditioning Technology Study Guide/Lab Manual; 7th Ed.
Authors: Whitman and Johnson
3. Practical Competencies, HVAC-R Lab Book

B. Required Materials

1. Notebook
2. Pens/Pencil
3. Calculator
4. Pressure/Temperature Chart
5. Safety Glasses

VI. METHOD OF PRESENTATION:

A. Methods of presentation typically include a combination of the following:

1. Handouts of all printed material covered in class.
2. Audiovisual aids (smart board and videos)
3. Independent study (reading of handouts, text, and preparing for tests).
4. Informal lectures (casual communication of knowledge).
5. Demonstrations (the use of testing equipment).

VII. METHOD OF EVALUATION:

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

1. Written tests 60%
2. Quizzes 40%
3. Student evaluation is done through completed assignments, quizzes, and tests.
4. Jupiter Grades will be used to view assignments and grades.

B. 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. Quizzes will be given and cannot be made up unless approval from 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 are expected to complete your own work. Students will also be expected to conform to the Student Code of Conduct that was handed out.

IX. SUPPORT SERVICES:

A. 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.

B. Service Center:

Students may get assistance with computer-related problems through the College's Service Center; help@northeast.edu. It is strongly advised that a student participate in on-line training via a formal course or the on-line tutorials available through Northeast Community College's homepage; <http://northeast.edu/help/>

Email: help@northeast.edu

Phone number: 402-844-HELP (4357)

In person: The Service Center is located in the Library on the Norfolk campus

Service Center Hours of Operation:

Sunday 1:00 p.m. - 9:00 p.m.

Monday - Thursday 7:00 a.m. to 10:00 p.m.

Friday 7:00 a.m. to 5:00 p.m.

If you have technical questions regarding the My Classes Online environment you need to contact the Service Center. Questions regarding the course content need to be directed to the instructor via My Classes Online Course Mail (email).

C. Advising & Academic Support Center (CWC 1284)

This is a one stop shop for all students. Advisors are available to assist with schedules, career planning, transfer questions, change of majors, academic recovery and other issues impacting academic success. Located in CWC 1284, students will find a study space, lounge area and computers. Direct contact information is as follows:

Amanda Engelhart – 402.844.7125 or amandae@northeast.edu

1. Tutoring – CWC 1284

2. Writer's Clinic – CWC 1284

D. 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.

E. Title IX:

While I want you to feel comfortable coming to me with issues you may be struggling with or concerns you may be having, please be aware that I have reporting requirements that are part of my job requirements at Northeast Community College.

For example, if you inform me of an issue of sexual harassment, sexual assault, or discrimination I will keep the information as private as I can, but I am required to bring it to the attention of the institution's Title IX Coordinator. The Associate Vice President of Human Resources is the Title IX Coordinator and can be reached by calling 402-844-7046. You could also call the Vice President of Student Services at 402-844-7273. Additionally, you can report incidents or complaints to the Dean of Student Life by calling 402-844-7722.

Another common example is if you are struggling with an issue that may be traumatic or unusually stress producing, I will likely inform the Northeast Counseling Services office. If you would like to reach out directly to the Counseling Office, the contact number is 402-844-7277.

Finally, know that if, for some reason, our interaction involves a disruptive behavior or potential violation of policy, I will inform the Director of Student Conduct office even when you and I may have reached a resolution to the incident. The purpose of this is to keep the Director apprised of any concerning behaviors and what was done to resolve them.

F. 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: APT 145

Office Phone: 402-844-7230

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

Email: paulb@northeast.edu

Office Hours: Tuesday and Thursday 3:00PM – 4:00PM
Monday & Wednesday 4:00PM – 5:00PM



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