

Department:

HVAC

Course Description:

This course is designed to introduce the student to terminology associated with heating and humidification. Gas/electric heating systems and heat pumps will be covered. Also covered will be the installation, operation, and service procedures need to safely operate heating equipment.

Course Competencies:

Upon completion of the course, the student should be able to:

1. Recognize the different fuel types used in various furnaces.
2. Identify different efficiency of furnaces.
3. Identify carbon monoxide safety violations.
4. Check gas pressures.
5. Inspect and perform standard seasonal maintenance and tune-up.
6. List sequence of operation.
7. Assess air flow/water flow.
8. Measure temperature split.
9. Check and adjust thermostat heat anticipators.
10. Perform start up procedures.
11. Apply trade math to daily applications.
12. Interpret mechanical drawings, symbols, and their applications.
13. Design and install venting for fossil flues appliances.
14. Explain heating systems design and functions.
15. Introduce airside and hydronic systems including various types of boilers, piping, chilled-water systems and their components.
16. Measurement and control air temperature, humidity, pressure, and velocity.
17. Maintenance and repairs of various HVAC systems.
18. Introduce trouble shooting and heating, cooling and heat pump systems.
19. Introduce troubleshooting of control circuits, electronic controls, and accessories.
20. Introduce troubleshooting of air quality and energy conservation equipment.
21. Identify the types of ferrous metal pipes.
22. Measure the sizes of ferrous metal pipes.
23. Identify the common malleable iron fittings.
24. Cut, ream, and thread ferrous metal pipe.
25. Join lengths of threaded pipe together and install fittings.
26. Describe the main points to consider when installing pipe runs.
27. Describe the methods used to join piping.

Course Content:

- A. Electric Heating Systems
 1. Components

- 2. Wiring
- B. Gas Heating Systems
 - 1. Components
 - 2. Wiring
- C. Air Source Heat Pumps
 - 1. Components
 - 2. Installation
- D. Geothermal Systems

Learning Assessments:

Cognitive Tests: Multiple choice, true-false, fill-in-the-blank questions, as well as lab testing.

Instructional Materials:

Textbook: Tomczyk, J., Silberstein, E., Whitman, B. & Johnson, B. (2016). *Refrigeration and Air Conditioning Technology* (8th ed.). Cengage Learning. ISBN-13: 978-1305578296

Lab Manual: Tomczyk, J., Silberstein, E., Whitman, B. & Johnson, B. (2016). *Lab Manual for Refrigeration and Air Conditioning Technology* (8th ed.). Cengage Learning. ISBN-13: 978-1305578708

Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the “Disabilities Self-Identification Form” on our [Disability Services website](#).

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

A Note on Harassment, Discrimination and Sexual Misconduct

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an [online report](#) about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our [Equity Grievance Policy](#).