

Department:

HVAC

Course Description:

This course is designed to introduce students to the broader picture that is HVAC. Students will become familiar with trade related organizations, job requirements, gain skills in soldering and brazing, and demonstrate learned skills to service and repair air conditioning systems. Students must earn a C grade or better in this course in order to advance to the next course.

Course Competencies:

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

1. Identify career and apprentice opportunities in the HVAC trade.
2. Describe the types of regulatory codes encountered in the HVAC trade.
3. Identify the types of schedules/drawings used in the HVAC trade.
4. State the precautions that must be taken when installing refrigerant piping.
5. Select the right tubing for the job.
6. Cut and bend copper tubing.
7. Safety join tubing by using flair and compression fittings.
8. Determine the kinds of hangers and supports needed for refrigerant piping.
9. State the basic safety requirements for pressure- testing a system.
10. Identify types of plastic pipe and state their uses.
11. Cut and join lengths of plastic pipe.
12. Demonstrate soldering and brazing techniques.
13. Explain how heat transfer principles occur in a cooling system, demonstrating an understanding of the terms and concepts used in the refrigeration cycle.
14. Calculate the temperature and pressure relationships at key points in the refrigeration cycle.
15. Demonstrate the use of temperature- and pressure-measuring instruments to make readings at key points in the refrigeration cycle.
16. Identify commonly used refrigerants and demonstrate the proper procedures for handling these refrigerants.
17. Identify the major components of a cooling system and explain how each type works.
18. Identify the major accessories available for cooling systems and explain how each works.
19. Identify the control devices used in cooling systems and explain how each works.
20. Install on or more of the following HVAC systems and their components: (1) Residential, (2) Commercial, and/or (3) Industrial.
21. Demonstrate refrigerant leak detection procedures.
22. Demonstrate refrigerant evacuation procedures.
23. Demonstrate refrigerant recovery procedures.
24. Demonstrate refrigerant charging procedures.
25. Apply trade math principles.

Course Content:

- A. Introduction to Air Conditioning parts and functions

- B. Cutting and Bending of tubing
- C. Refrigerant characteristics
- D. Refrigerant handling

Learning Assessments:

Competencies may be evaluated by multiple measures, including multiple choice, true-false, fill-in-the-blank tests, 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](#).