

Department:

HVAC

Course Description:

This course covers generating electricity, types of electricity- direct (DC) and alternating (AC) current circuit fundamentals, magnetism, and electrical components.

Course Competencies:

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

1. State and demonstrate the safety precautions that must be followed when working on electrical equipment and circuits.
2. State how electrical power is distributed.
3. State how AC and DC electricity are different.
4. Review math principles pertaining to basic algebraic equations.
5. Apply Ohm's law to calculate the current, voltage, and resistance in a circuit.
6. Apply the power formula to calculate how much power is consumed by a circuit.
7. Describe how voltage, current, resistance, and power are related.
8. Describe the difference between series and parallel circuits and calculate loads in each.
9. Construct parallel circuits.
10. Construct series circuits.
11. Construct combination parallel and series circuits.
12. Read and Interpret common electrical symbols.
13. Read and Interpret electrical diagrams.
14. Describe the purpose and operation of the various electrical components used in HVAC equipment.
15. Perform voltage, current, and resistance measurement using electrical test equipment.

Course Content:

- A. Electrical current
 1. Direct current
 2. Alternating current
- B. Electrical circuits
 1. Series circuits
 2. Parallel circuits
- C. Controls
 1. Manual
 2. Automatic
- D. Troubleshooting

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](#).