



## CEC126 Advanced Heating Systems Syllabus

### Course Information

Credits	3
Campus	Washburn Institute of Technology
Address	5724 SW Huntoon
City/State/Zip	Topeka, Kansas 66604
Office Fax	785-273-7080

### Description

This course will introduce students to electric furnaces and hydronic heating with an emphasis on the electrical systems of those units and code requirements for the safe installation of such equipment. Indoor air quality will be discussed in detail as a major factor in human comfort.

### Textbooks

Carter Stanfield & David Skaves, *AHRI Fundamentals of HVACR*, Edition: 3rd, ISBN: 978-0-13-401616-0

### Student Learning Outcomes:

- A. Communicate effectively
- B. Integrate technology
- C. Learn effectively
- D. Demonstrate cooperative teamwork skills
- E. Apply safety in the workplace
- F. Think critically and creatively
- G. Demonstrate responsible work ethics

### Competencies

- 1. Evaluate electric furnace operations
- 2. Troubleshoot an electric furnace.
- 3. List the order of operations for an electric forced air furnace.
- 4. Describe the layout of a typical residential hydronic heating system with zone controls.
- 5. Explain the maximum working pressure and maximum temperature of hydronic heating systems.
- 6. Identify the types of terminal equipment and explain how they function with hydronic heating systems.
- 7. Compare a hydronic system versus a steam heating system.
- 8. Identify and explain the role of boiler trim and system components.
- 9. Perform proper procedures in purging air from a hydronic system.

10. Plot conditions using the psychometric chart.
11. Describe the factors involved in comfort.
12. Demonstrate knowledge of air cleaning devices.
13. Assess air flow
14. Explain the difference between propeller and centrifugal fans and blowers.
15. Create a schematic based on the wiring of an electric furnace.
16. Draw the schematics for a basic residential boiler.

## Guidelines for Success

### Assessment Plan

Assessment is an integral part of the educational process at Washburn Tech and accurate feedback is an important tool in continuously improving the institution's technical programs. Students can expect to participate in assessment activities prior to entry into programs, within specific courses and following program completion for specific fields of study.

### Grading Scale

92 - 100%	= A
85 – 91%	= B
78 - 84%	= C
70 – 77%	= D
<70%	= F

### Attendance

Classroom attendance is required. Material missed must be made up with the instructor.

### Disability

The Americans with Disabilities Act (ADA) Office is responsible for assisting in arranging accommodations and for identifying resources at Washburn Institute of Technology for persons with disabilities. Qualified students with disabilities **MUST** self-identify by completing an application. In addition students must provide appropriate medical documentation to the ADA coordinator to be eligible for accommodations. New requests for accommodations should be submitted at least two months or more prior to the date the accommodations are needed. However, please contact the ADA office as soon as a need may arise. Depending on the accommodation request, four to eight weeks lead time may be needed for timely and effective provision of accommodations.

The ADA Office coordinates and assists in arranging accommodations it deems appropriate for eligible students on a case-by-case basis. If you are a student with a disability that may substantially limit your ability to participate in any of our classes and you believe that you will need accommodations, it is your responsibility to contact: ADA Coordinator, 785.670.3365 or [Gloria.christian@washburn.edu](mailto:Gloria.christian@washburn.edu).

Washburn University prohibits discrimination on the basis of race, color, religion, age, national origin, ancestry, disability, sex, sexual orientation, gender identity, genetic information, veteran status, or marital or parental status. The following person has been designated to handle inquiries regarding the non-discrimination policies: Dr. Pamela Foster, Equal Opportunity Director/Title IX Coordinator, Washburn University, 1700 SW College Ave, Topeka, Kansas 66621, 785.670.1509, [eodirector@washburn.edu](mailto:eodirector@washburn.edu)