

## Washtenaw Community College Comprehensive Report

### HVA 205 Hydronic Systems Effective Term: Winter 2024

#### Course Cover

**College:** Advanced Technologies and Public Service Careers  
**Division:** Advanced Technologies and Public Service Careers  
**Department:** Heating, Ventilation and A/C  
**Discipline:** Heating, Ventilation, Air Conditioning and Refrigeration  
**Course Number:** 205  
**Org Number:** 14750  
**Full Course Title:** Hydronic Systems  
**Transcript Title:** Hydronic Systems  
**Is Consultation with other department(s) required:** No  
**Publish in the Following:** College Catalog , Time Schedule , Web Page  
**Reason for Submission:** Three Year Review / Assessment Report  
**Change Information:**

**Consultation with all departments affected by this course is required.**

**Course description**

**Outcomes/Assessment**

**Rationale:** Three-year syllabus review based on assessment.

**Proposed Start Semester:** Winter 2024

**Course Description:** In this course, students will gain knowledge and skills related to hydronic systems, including steam and hot water boilers. Students will identify major component; students will also analyze and inspect safety and control systems. Students will study the different piping arrays that are used for delivery of heat from a boiler. Electrical wiring of zoning systems is emphasized and practiced. Students remove, inspect and replace boiler components. Students will also learn how to do a heat loss calculation of a residential structure to ensure the boiler is the correct size when updating a system.

#### Course Credit Hours

**Variable hours:** No

**Credits:** 4

**Lecture Hours: Instructor:** 45 **Student:** 45

**Lab: Instructor:** 45 **Student:** 45

**Clinical: Instructor:** 0 **Student:** 0

**Total Contact Hours: Instructor:** 90 **Student:** 90

**Repeatable for Credit:** NO

**Grading Methods:** Letter Grades

Audit

**Are lectures, labs, or clinicals offered as separate sections?:** NO (same sections)

#### College-Level Reading and Writing

College-level Reading & Writing

#### College-Level Math

**Requisites****Prerequisite**

HVA 108 minimum grade "C"

**General Education****Request Course Transfer****Proposed For:**

Eastern Michigan University

Ferris State University

**Student Learning Outcomes****1. Identify hydronic systems.****Assessment 1**

Assessment Tool: Outcome-related departmental final exam questions

Assessment Date: Fall 2025

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the students will score 70% or higher

Who will score and analyze the data: Departmental faculty

**2. Identify hydronic system components.****Assessment 1**

Assessment Tool: Outcome-related departmental final exam questions

Assessment Date: Fall 2025

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the students will score 70% or higher

Who will score and analyze the data: Departmental faculty

**3. Demonstrate proper wiring of hydronic zoning systems.****Assessment 1**

Assessment Tool: Outcome-related wiring project

Assessment Date: Fall 2025

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the students will score 70% or higher

Who will score and analyze the data: Departmental faculty

**4. Troubleshoot basic hydronic system components.****Assessment 1**

Assessment Tool: Outcome-related departmental final exam questions

Assessment Date: Fall 2025

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of the students will score 70% or higher

Who will score and analyze the data: Departmental faculty

### Course Objectives

1. Identify steam hydronic heating systems.
2. Identify closed loop hot water hydronic heating systems.
3. Identify hydronic safety devices.
4. Identify hydronic control devices.
5. Identify hydronic pumping devices.
6. Identify hydronic heat emitters.
7. Interpret pump curves related to water flow.
8. Evaluate a residential structure for heat load requirements.
9. Compute water flow requirements for hydronic heat emitters.
10. Demonstrate techniques for purging air from hydronic systems.
11. Diagnose water flow problems.
12. Diagnose mechanical problems.
13. Diagnose electrical problems.
14. Demonstrate correct wiring for various hydronic zoning systems.

### New Resources for Course

#### Course Textbooks/Resources

##### Textbooks

Siegenthaler, J.. *Modern Hydronic Heating*, 4 ed. Cengage, 2023, ISBN: 9781337904919.

Whitman,B. *Refrigeration and Air Conditioning Technology*, 8 ed. Delmar, 2016, ISBN: 978-035701864.

##### Manuals

##### Periodicals

##### Software

#### Equipment/Facilities

Level III classroom

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
<b>Faculty Preparer:</b> <i>Robert Carter</i>	<i>Faculty Preparer</i>	<i>Jul 26, 2023</i>
<b>Department Chair/Area Director:</b> <i>Brian Martindale</i>	<i>Recommend Approval</i>	<i>Jul 31, 2023</i>
<b>Dean:</b> <i>Jimmie Baber</i>	<i>Recommend Approval</i>	<i>Aug 09, 2023</i>
<b>Curriculum Committee Chair:</b> <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Jan 07, 2024</i>
<b>Assessment Committee Chair:</b> <i>Jessica Hale</i>	<i>Recommend Approval</i>	<i>Jan 08, 2024</i>
<b>Vice President for Instruction:</b> <i>Brandon Tucker</i>	<i>Approve</i>	<i>Jan 09, 2024</i>

## Washtenaw Community College Comprehensive Report

### HVA 205 Hydronic Systems Effective Term: Winter 2018

#### Course Cover

**Division:** Advanced Technologies and Public Service Careers

**Department:** Heating, Ventilation and A/C

**Discipline:** Heating, Ventilation, Air Conditioning and Refrigeration

**Course Number:** 205

**Org Number:** 14750

**Full Course Title:** Hydronic Systems

**Transcript Title:** Hydronic Systems

**Is Consultation with other department(s) required:** No

**Publish in the Following:** College Catalog , Time Schedule , Web Page

**Reason for Submission:** Three Year Review / Assessment Report

#### **Change Information:**

**Consultation with all departments affected by this course is required.**

**Outcomes/Assessment**

**Other:**

**Rationale:** Review syllabus.

**Proposed Start Semester:** Winter 2018

**Course Description:** This course covers an overview of hydronics which includes steam and hot water boilers. Major components are identified; safety and control systems are analyzed and inspected. Flow characteristics are examined for proper calculation of piping and radiator sizes. Electrical wiring of zoning systems is emphasized and practiced.

#### Course Credit Hours

**Variable hours:** No

**Credits:** 4

**Lecture Hours: Instructor:** 45 **Student:** 45

**Lab: Instructor:** 45 **Student:** 45

**Clinical: Instructor:** 0 **Student:** 0

**Total Contact Hours: Instructor:** 90 **Student:** 90

**Repeatable for Credit:** NO

**Grading Methods:** Letter Grades

Audit

**Are lectures, labs, or clinicals offered as separate sections?:** NO (same sections)

#### College-Level Reading and Writing

College-level Reading & Writing

#### College-Level Math

#### Requisites

## **Prerequisite**

HVA 108 minimum grade "C"

## **General Education**

## **Request Course Transfer**

### **Proposed For:**

Eastern Michigan University  
Ferris State University

## **Student Learning Outcomes**

1. Identify hydronic systems.

### **Assessment 1**

Assessment Tool: Departmental final exam will be used to assess understanding of key concepts

Assessment Date: Winter 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: A minimum of 70% of the students should achieve a score of 70% or higher

Who will score and analyze the data: Departmental faculty

2. Identify hydronic system components.

### **Assessment 1**

Assessment Tool: Departmental final exam will be used to assess understanding of key concepts

Assessment Date: Winter 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: A minimum of 70% of the students should achieve a score of 70% or higher

Who will score and analyze the data: Departmental faculty

3. Demonstrate proper wiring of hydronic zoning systems.

### **Assessment 1**

Assessment Tool: Student project

Assessment Date: Winter 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: A minimum of 70% of the students should achieve a score of 70% or higher

Who will score and analyze the data: Departmental faculty

4. Troubleshoot basic hydronic system components.

**Assessment 1**

Assessment Tool: Departmental final exam will be used to assess understanding of key concepts

Assessment Date: Winter 2020

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: A minimum of 70% of the students should achieve a score of 70% or higher

Who will score and analyze the data: Departmental faculty

**Course Objectives**

1. Identify steam hydronic heating systems.
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11. Diagnose water flow problems.
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13. Diagnose electrical problems.
14. Demonstrate correct wiring for various hydronic zoning systems.

**New Resources for Course**

**Course Textbooks/Resources**

Textbooks

Siegenthaler, J.. *Modern Hydronic Heating*, 3 ed. Delmar, 2012, ISBN: 9781428335158.

Whitman,B. *Refrigeration and Air Conditioning Technology*, 7 ed. Delmar, 2013, ISBN: 9781111644475.

Manuals

Periodicals

Software

**Equipment/Facilities**

Level III classroom

**Reviewer**

**Faculty Preparer:**

*Michael Kontry*

**Action**

*Faculty Preparer*

**Date**

*Apr 06, 2017*

**Department Chair/Area Director:**

*Robert Carter*    *Recommend Approval*    *Jun 08, 2017*

**Dean:**

*Brandon Tucker*    *Recommend Approval*    *Jun 21, 2017*

**Curriculum Committee Chair:**

*Lisa Veasey*    *Recommend Approval*    *Sep 18, 2017*

**Assessment Committee Chair:**

*Michelle Garey*    *Recommend Approval*    *Sep 19, 2017*

**Vice President for Instruction:**

*Kimberly Hurns*    *Approve*    *Sep 24, 2017*