

## Washtenaw Community College Comprehensive Report

### HVA 105 Residential and Light Commercial Heating Systems Effective Term: Spring/Summer 2025

#### 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:** 105  
**Org Number:** 14750  
**Full Course Title:** Residential and Light Commercial Heating Systems  
**Transcript Title:** Res & Light Commer Heat Systms  
**Is Consultation with other department(s) required:** No  
**Publish in the Following:** College Catalog , Time Schedule , Web Page  
**Reason for Submission:** Course Change

#### **Change Information:**

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

#### **Course description**

**Pre-requisite, co-requisite, or enrollment restrictions**

**Outcomes/Assessment**

**Objectives/Evaluation**

**Rationale:** Remove MTH067 as a prerequisite for HVA 105 (listed in the catalog) and add MTH 125X and 160/160X as an option.

**Proposed Start Semester:** Winter 2025

**Course Description:** In this course, students will build on the heating system skills and knowledge learned in prerequisite courses. Major units covered include HVAC service and preventative maintenance for residential electric, gas, oil or hydronic and heat pump systems. Students will be presented with an overview of indoor air quality, air distribution and installation concepts and techniques.

#### 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

No Level Required

**Requisites****Prerequisite**

Academic Math Level 2

or

**Prerequisite**

MTH 125; may enroll concurrently

or

**Prerequisite**

MTH 125X; may enroll concurrently

or

**Prerequisite**

MTH 160; may enroll concurrently

or

**Prerequisite**

MTH 160X; may enroll concurrently

and

**Prerequisite**

HVA 101 minimum grade "C"

and

**Prerequisite**

HVA 103 minimum grade "C"

**General Education****Request Course Transfer****Proposed For:****Student Learning Outcomes**

1. Diagnose service problems associated with residential heating systems.

**Assessment 1**

Assessment Tool: Live furnace lab fault diagnosis

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: Checklist

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 industry standards for maintenance of residential heating equipment.

**Assessment 1**

Assessment Tool: Outcome-related department final exam questions

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: 70% of the students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

3. Recognize Indoor Air Quality (IAQ) issues and standards.

**Assessment 1**

Assessment Tool: Outcome-related department final exam questions

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: 70% of the students will score 70% or higher.

Who will score and analyze the data: Departmental faculty

**Course Objectives**

1. Diagnose electrical failures.
2. Diagnose mechanical failures.
3. Explain troubleshooting techniques.
4. Recognize components for electric, oil and heat pump heating systems.
5. Identify heating components requiring regular maintenance.
6. Recognize steps on various heating system maintenance checklists.
7. Explore indoor air quality (IAQ) issues.
8. Explain industry standards pertaining to IAQ.
9. Apply simple mathematical calculations (addition, subtraction, multiplication or division) to determine results of diagnostic procedures.
10. Compare the results of diagnostic procedures to manufacturer's specifications.

**New Resources for Course****Course Textbooks/Resources**

Textbooks

Manuals

Periodicals

Software

**Equipment/Facilities**

Level I classroom

Data projector/computer

<b><u>Reviewer</u></b>	<b><u>Action</u></b>	<b><u>Date</u></b>
<b>Faculty Preparer:</b> <i>Brian Martindale</i>	<i>Faculty Preparer</i>	<i>Oct 17, 2024</i>
<b>Department Chair/Area Director:</b> <i>Brian Martindale</i>	<i>Recommend Approval</i>	<i>Oct 21, 2024</i>
<b>Dean:</b> <i>Eva Samulski</i>	<i>Recommend Approval</i>	<i>Oct 22, 2024</i>
<b>Curriculum Committee Chair:</b> <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Jan 11, 2025</i>
<b>Assessment Committee Chair:</b> <i>Jessica Hale</i>	<i>Recommend Approval</i>	<i>Jan 22, 2025</i>
<b>Vice President for Instruction:</b> <i>Brandon Tucker</i>	<i>Approve</i>	<i>Jan 30, 2025</i>

## Washtenaw Community College Comprehensive Report

### HVA 105 Residential and Light Commercial Heating Systems Effective Term: Spring/Summer 2020

#### Course Cover

**Division:** Advanced Technologies and Public Service Careers  
**Department:** Heating, Ventilation and A/C  
**Discipline:** Heating, Ventilation, Air Conditioning and Refrigeration  
**Course Number:** 105  
**Org Number:** 14750  
**Full Course Title:** Residential and Light Commercial Heating Systems  
**Transcript Title:** Res & Light Commer Heat Systms  
**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:** Three-year update

**Proposed Start Semester:** Fall 2020

**Course Description:** In this course, students build on the heating system skills and knowledge learned in prerequisite courses. Major units covered include HVAC service and preventative maintenance for residential electric, gas, oil or hydronic and heat pump systems. Students get an overview of indoor air quality, air distribution and installation concepts and techniques.

#### 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

Level 2

#### Requisites

**Prerequisite**

MTH 067; may enroll concurrently

or Academic Math level 2

and

**Prerequisite**

HVA 101 minimum grade "C"

and

**Prerequisite**

HVA 103 minimum grade "C"

## **General Education**

### **Request Course Transfer**

**Proposed For:**

### **Student Learning Outcomes**

1. Diagnose service problems associated with residential heating systems.

**Assessment 1**

Assessment Tool: Live furnace lab fault diagnosis

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: Checklist

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 industry standards for maintenance of residential heating equipment.

**Assessment 1**

Assessment Tool: Department final exam

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: 70% of the students will score 70% or higher on the outcome-related questions.

Who will score and analyze the data: Departmental faculty

3. Recognize Indoor Air Quality (IAQ) issues and standards.

**Assessment 1**

Assessment Tool: Department final exam

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: 70% of the students will score 70% or higher on the outcome-related questions

Who will score and analyze the data: Departmental faculty

### **Course Objectives**

1. Diagnose electrical failures.
2. Diagnose mechanical failures.
3. Explain troubleshooting techniques.

4. Recognize components for electric, oil and heat pump heating systems.
5. Identify heating components requiring regular maintenance.
6. Recognize steps on various heating system maintenance checklists.
7. Explore indoor air quality (IAQ) issues.
8. Explain industry standards pertaining to IAQ.
9. Apply simple mathematical calculations (addition, subtraction, multiplication or division) to determine results of diagnostic procedures and compare them to manufacturer's specifications.

### **New Resources for Course**

#### **Course Textbooks/Resources**

Textbooks  
Manuals  
Periodicals  
Software

#### **Equipment/Facilities**

Level I classroom  
Data projector/computer

<b><u>Reviewer</u></b>	<b><u>Action</u></b>	<b><u>Date</u></b>
<b>Faculty Preparer:</b> <i>Brian Martindale</i>	<i>Faculty Preparer</i>	<i>Aug 01, 2019</i>
<b>Department Chair/Area Director:</b> <i>Brian Martindale</i>	<i>Recommend Approval</i>	<i>Aug 06, 2019</i>
<b>Dean:</b> <i>Brandon Tucker</i>	<i>Recommend Approval</i>	<i>Aug 22, 2019</i>
<b>Curriculum Committee Chair:</b> <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>Sep 30, 2019</i>
<b>Assessment Committee Chair:</b> <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Oct 04, 2019</i>
<b>Vice President for Instruction:</b> <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Oct 07, 2019</i>

# Washtenaw Community College Comprehensive Report

## HVA 105 Residential and Light Commercial Heating Systems Effective Term: Spring/Summer 2014

### Course Cover

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

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

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

**Course Number:** 105

**Org Number:** 14750

**Full Course Title:** Residential and Light Commercial Heating Systems

**Transcript Title:** Res & Light Commer Heat Systms

**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**

**Distribution of contact hours**

**Outcomes/Assessment**

**Rationale:** Regular three year review following assesement

**Proposed Start Semester:** Spring/Summer 2014

**Course Description:** In this course, students build on the heating system skills and knowledge learned in prerequisite courses. Major units covered include HVAC mathematics, service and preventative maintenance for residential electric, gas, oil or hydronic and heat pump systems. Students get an overview of indoor air quality, air distribution and installation concepts and techniques. The title of this course was previously Heating, Ventilation and Air Conditioning III.

### 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

Level 2

### Requisites

**Prerequisite**

MTH 067; may enroll concurrently

**Prerequisite**

HVA 101 minimum grade "C"; may enroll concurrently and

**Prerequisite**

HVA 103 minimum grade "C"

**General Education****Request Course Transfer**

Proposed For:

**Student Learning Outcomes**

1. Diagnose service problems associated with residential heating systems.

**Assessment 1**

**Assessment Tool:** Computer simulation

**Assessment Date:** Winter 2016

**Assessment Cycle:** Every Three Years

**Course section(s)/other population:** all

**Number students to be assessed:** all

**How the assessment will be scored:** Check list

**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 industry standards for maintenance of residential heating equipment.

**Assessment 1**

**Assessment Tool:** Department final exam

**Assessment Date:** Winter 2016

**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. Recognize Indoor Air Quality (IAQ) issues and standards.

**Assessment 1**

**Assessment Tool:** Department final exam

**Assessment Date:** Winter 2016

**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. Diagnose electrical and mechanical failures.

**Matched Outcomes**

2. Explain troubleshooting techniques.

**Matched Outcomes**

3. Recognize components for electric, oil and heat pump heating systems.

**Matched Outcomes**

4. Identify heating and components requiring regular maintenance.

**Matched Outcomes**



5. Explain how maintenance is performed.

**Matched Outcomes**

6. Explore indoor air quality issues.

**Matched Outcomes**

7. Explain industry standards pertaining to IAQ.

**Matched Outcomes**

**New Resources for Course**

**Course Textbooks/Resources**

Textbooks

Manuals

Periodicals

Software

**Equipment/Facilities**

**Reviewer**

**Action**

**Date**

**Faculty Preparer:**

*Michael Kontry*

*Faculty Preparer*

*Oct 16, 2013*

**Department Chair/Area Director:**

*Les Pullins*

*Recommend Approval*

*Nov 05, 2013*

**Dean:**

*Marilyn Donham*

*Recommend Approval*

*Nov 22, 2013*

**Vice President for Instruction:**

*Bill Abernethy*

*Approve*

*Dec 17, 2013*