

## Washtenaw Community College Comprehensive Report

### HVA 203 Refrigeration 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:** 203

**Org Number:** 14750

**Full Course Title:** Refrigeration Systems

**Transcript Title:** Refrigeration 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**

**Objectives/Evaluation**

**Other:**

**Rationale:** Syllabus review

**Proposed Start Semester:** Winter 2018

**Course Description:** This course covers commercial refrigeration systems. This includes system operation, installation, maintenance and troubleshooting. Topics covered include types of commercial refrigeration systems, evaporators, compressors, condensers, expansion devices, defrost, controls and cold storage principles.

#### Course Credit Hours

**Variable hours:** No

**Credits:** 3

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

**Lab: Instructor:** 15 **Student:** 15

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

**Total Contact Hours: Instructor:** 60 **Student:** 60

**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 the types of refrigeration systems and their operation.

### **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 score 70% or higher

Who will score and analyze the data: Departmental faculty

2. Identify the components of refrigeration systems and their operation.

### **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. Develop a working commercial refrigeration system.

### **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-designed 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. Recognize refrigerant properties for the purpose of retrofitting existing refrigeration systems and charging new refrigeration 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

**Course Objectives**

- 1. Identify high, medium and low temperature refrigeration systems.
- 2. Identify water and air cooled refrigeration systems.
- 3. Identify systems used in special refrigeration applications.
- 4. Identify types of compressors.
- 5. Identify types of condensers.
- 6. Identify types of expansion devices.
- 7. Identify types of evaporators.
- 8. Develop a wiring diagram for a commercial refrigeration system.
- 9. Assemble refrigeration components and prepare a system for evacuation and charging.
- 10. Measure refrigeration systems superheat and subcooling for the purpose of determining the correct system refrigerant charge and operation.
- 11. Classify azeotropic refrigerant blends, their characteristics and their oil requirements.
- 12. Classify zeotropic refrigerants, their characteristics and their oil requirements.

**New Resources for Course**

**Course Textbooks/Resources**

Textbooks

Wirz, D.. *Commercial Refrigeration for A/C Technicians*, 2 ed. Clifton Park: Delmar, 2010, ISBN: 9781428335264.

Manuals

Periodicals

Software

**Equipment/Facilities**

Level III classroom

**Reviewer**

**Action**

**Date**

**Faculty Preparer:**

*Michael Kontry*

*Faculty Preparer*

*Apr 11, 2017*

