



**Course Information**

<b>Course Title</b>	Refrigeration Principles
<b>Course Prefix, Num. and Title</b>	HART 1307 Refrigeration Principles
<b>Division</b>	Vocational Science
<b>Department</b>	Air Conditioning, Heating, Refrigeration and Electrical Technology
<b>Course Type</b>	WECM Course
<b>Course Catalog Description</b>	An introduction to the refrigeration cycle, heat transfer theory, temperature/pressure relationship, refrigerant handling, refrigeration components
<b>Pre-Requisites</b>	None
<b>Co-Requisites</b>	Enter Co-Requisites Here.

**Semester Credit Hours**

<b>Total Semester Credit Hours (SCH): Lecture Hours:</b>	3:1:6
<b>Lab/Other Hours</b>	
<b>Equated Pay Hours</b>	4
<b>Lab/Other Hours Breakdown: Lab Hours</b>	6
<b>Lab/Other Hours Breakdown: Clinical Hours</b>	Enter Clinical Hours Here.
<b>Lab/Other Hours Breakdown: Practicum Hours</b>	Enter Practicum Hours Here.
<b>Other Hours Breakdown</b>	List Total Lab/Other Hours Here.

**Approval Signatures**

<b>Title</b>	<b>Signature</b>	<b>Date</b>
<b>Prepared by:</b>		
<b>Department Head:</b>		
<b>Division Chair:</b>		
<b>Dean/VPI:</b>		
<b>Approved by CIR:</b>		

## Additional Course Information

**Topical Outline:** Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, and clinical or other non-lecture instruction).

- refrigeration fundamentals
- tools and materials
- basic systems
- compression systems and controls
- refrigerant recovery, and recycling
- domestic appliances
- servicing small appliances

### Course Learning Outcomes:

**Learning Outcomes – Upon successful completion of this course, students will:**

- 1) Refrigerant recovery and recycling techniques.
- (2) Draw and label the basic refrigeration cycle piping schematic.
- (3) Identify and describe the operation of seven refrigeration accessories.
- (4) Swage and braze copper tubing to form clean, neat, and leak proof joints.
- (5) Make leak proof flare connections.
- (6) Locate and repair leaks in a refrigeration system.
- (7) Evacuate a refrigeration system to a low micron level (< 1000 um).
- (8) Use five (5) methods to check the charge on a refrigeration system.
- (9) Calculate mathematical formulas used in the HVAC/R trade.
- (10) Troubleshoot refrigerant-side problems.
- (11) Describe safety procedures in refrigeration.
- (12) Name, identify and discuss the operation of two types, and five kinds of compressors
- (13) Name, identify and discuss the operation of condensers
- (14) Name, identify and discuss the operation of evaporators
- (15) Name, identify and discuss the operation of metering devices

### Methods of Assessment:

#### Methods of Assessment

- (1) Quiz and lab exercises

Quiz and examination questions

- (2) Classroom quiz
- (3) Lab quiz
- (4) Lab Quiz
- (5) Lab quiz
- (6) Lab quiz
- (7) Classroom and lab quiz
- (8) Classroom quiz and Examination questions
- (9) Classroom and lab quiz
- (10) Classroom quiz
- (11) Classroom quiz and examination questions
- (12) Classroom quiz and examination questions
- (13) Classroom quiz and examination questions
- (14) Classroom quiz and examination questions

**Required text(s), optional text(s) and/or materials to be supplied by the student:**

1. Refrigeration & Air Conditioning Technology

Delmar Cengage Learning ISBN 13:978-1-4283-1936-3

**Suggested Course Maximum:**

30

**List any specific or physical requirements beyond a typical classroom required to teach the course.**

Air Conditioning, Heating, Refrigeration, and Electrical – Lab

**Course Requirements/Grading System:** Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course.

90% to 100%	= A
80% to 89%	= B
70% to 79%	= C
60% to 69%	= D
Below 60%	= F

The semester final grade is based on the percentage basis between daily lab work, daily classroom assignments, and semester final.

Daily lab work counts for 50% of final: Daily Classroom work is 20% of final: End of semester written final and lab final is 30% of final average.

**Curriculum Checklist:**

- Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.
- Administrative WCJC Core Course.** Attach the Core Curriculum Review Forms
  - Critical Thinking
  - Communication

Empirical & Quantitative Skills

Teamwork

Social Responsibility

Personal Responsibility

**WECM Course** -If needed, revise the Program SCANS Matrix and Competencies Checklist