

**STATE UNIVERSITY OF NEW YORK  
COLLEGE OF TECHNOLOGY  
CANTON, NEW YORK**



**MASTER SYLLABUS**

**COURSE NUMBER – COURSE NAME  
HVAC204 – Commercial Refrigeration Lab**

**Created by: Stan Skowronek**

**Updated by: Paul Todd, 10/2/2019**

**Canino School of Engineering Technology**

**Department: Mechanical & Energy Systems**

**Semester/Year: Spring 2020**

- A. **TITLE:** Commercial Refrigeration Lab
- B. **COURSE NUMBER:** HVAC204
- C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

# Credit Hours: 3  
# Lecture Hours: 0 per week  
# Lab Hours: 9 per week  
Other: 0 per week

Course Length: 15 Weeks

- D. **WRITING INTENSIVE COURSE:** Yes  No
- E. **GER CATEGORY:** None:  Yes: GER  
*If course satisfies more than one:* GER
- F. **SEMESTER(S) OFFERED:** Fall  Spring  Fall & Spring

G. **COURSE DESCRIPTION:**

The repair of refrigerating and air conditioning equipment are the emphasis of this course. Students remove and replace the basic refrigeration cycle and the function of each component; compressor, condenser, evaporator and metering device. Use of hand and power tools is stressed in laboratory work. Students cut, bend, solder, braze, flare, and swage cooper tubing. Flowing nitrogen is stressed during brazing operations

- H. **PRE-REQUISITES:** None  Yes  If yes, list below:

**CO-REQUISITES:** None  Yes  If yes, list below:

HVAC203

**I. STUDENT LEARNING OUTCOMES: (see key below)**

By the end of this course, the student will be able to:

<u>Course Student Learning Outcome</u> <u>[SLO]</u>	<u>Program Student Learning Outcome</u> <u>[PSLO]</u>	<u>GER</u> <u>[If Applicable]</u>	<u>ISLO &amp; SUBSETS</u>	
1.Remove and replace components and functions in commercial and industrial refrigeration applications.			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
2. Demonstrate procedures for evacuating and recharging a refrigeration system.			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
3. Read and interpret pressure-enthalpy diagrams charts and scales			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
4. Demonstrate proper installation and service of refrigeration systems	3). Perform quality work that ensures safe and functional syatems.		3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
5). Work with team members to install components	4). Function effectively as a member of a team engaged in activities of installation, service, and maintenance of HVAC systems		3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
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KEY	<u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u>
ISLO #	ISLO & Subsets
1	<b>Communication Skills</b> Oral [O], Written [W]
2	<b>Critical Thinking</b> <i>Critical Analysis [CA] , Inquiry &amp; Analysis [IA] , Problem Solving [PS]</i>
3	<b>Foundational Skills</b> <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
4	<b>Social Responsibility</b> <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
5	<b>Industry, Professional, Discipline Specific Knowledge and Skills</b>

\*Include program objectives if applicable. Please consult with Program Coordinator

J. **APPLIED LEARNING COMPONENT:** Yes  No

If YES, select one or more of the following categories:

- |   |  |
|---|--|
| <input type="checkbox"/> Classroom/Lab      | <input type="checkbox"/> Civic Engagement              |
| <input type="checkbox"/> Internship         | <input type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement | <input type="checkbox"/> Research                      |
| <input type="checkbox"/> Practicum          | <input type="checkbox"/> Entrepreneurship              |
| <input type="checkbox"/> Service Learning   | (program, class, project)                              |
| <input type="checkbox"/> Community Service  |  |

K. **TEXTS:**

Auvil, Ronnie J., HVAC and Refrigeration Systems, ATP, 2015

L. **REFERENCES:**

M. **EQUIPMENT:** None  Needed: HVAC tool list (Program Website)

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

Lab reports, projects & participation

P. **DETAILED COURSE OUTLINE:**

Q. **LABORATORY OUTLINE:** None  Yes

1. **Commercial refrigeration controls**

1.1. **Pump down systems**

1.2. **Defrost controls**

1.3. **Fan delays**

1.4. **Electric defrost**

1.5. **Hot gas defrost**

1.6. **Passive defrost**

1.7. **Liquid line heat exchangers**

1.8. **Multivoltage systems**

2. **Wiring and installation**

2.1. **Compressors**

2.2. **Defrost controls**

2.3. **Solenoids**

2.4. **Service panels**

- 2.5. Cold controls, electronic & mechanical**
- 2.6. Pressure switches**
- 2.7. Start relays & caps**
- 3. Refrigeration projects**

**3.1.1. The remaining 10 weeks provides students with the opportunity to repair, relocate, and install refrigeration equipment, including:**

- 4. Ice makers**
- 5. Walk in cooler equipment**
- 6. Commercial refrigerators**
- 7. Water chillers**
- 8. Residential refrigerators & freezers**
- 9. Industrial condensing units**