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

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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 commercial refrigeration laboratory will focus on evaporator defrost cycles in freezer applications. Our student technicians will focus on applying all their course work on controlling and functioning defrost cycles. Student technicians will discover the complexity of the air handler cooling systems along with the electronic controls of heat pumps. Additionally, our student technicians will study and take the EPA 608 exam to handle refrigerants in compliance with the Clean Air Act properly.

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:

Course Student Learning Outcome [SLO]	***Program Student Learning Outcome [PSLO]***	***GER*** *[If Applicable]*	***ISLO & SUBSETS***	
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	**Institutional Student Learning Outcomes [ISLO 1 – 5]**
ISLO #	**ISLO & Subsets**
1	**Communication Skills** Oral [O], Written [W]
2	**Critical Thinking** *Critical Analysis [CA] , Inquiry & Analysis [IA] , Problem Solving [PS]*
3	**Foundational Skills** *Information Management [IM], Quantitative Lit,/Reasoning [QTR]*
4	**Social Responsibility** *Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]*
5	**Industry, Professional, Discipline Specific Knowledge and Skills**

*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:

- ☐ Classroom/Lab
- ☐ Internship
- ☐ Clinical Placement
- ☐ Practicum
- ☐ Service Learning
- ☐ Community Service

☐ Civic Engagement
☐ Creative Works/Senior Project
☐ Research
☐ Entrepreneurship
(program, class, project)

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 exhangers
1.8. Multivoltage sytems
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**