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

MASTER SYLLABUS

HVAC 204 – Commericial Refrigeration Lab

CIP Code:
47.0201

Created by: Stan Skowronek
Updated by: Jay Simmons

School: Canino School of Engineering Technology
Department: Mechanical & Energy Systems
Implementation Semester/Year: Fall 2026

A. TITLE:

Commercial Refrigeration Lab

B. COURSE NUMBER:

HVAC 204

C. CREDIT HOURS (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity):

# Credit Hours per Week	**2**
# Lecture Hours per Week	**0**
# Lab Hours per Week	**6**
Other per Week	

D. WRITING INTENSIVE COURSE:

Yes	
No	X

E. GER CATEGORY: None

Does course satisfy a GER category(ies)? If so, please select all that apply.

[1-2] Communication	
[3] Diversity: Equity, Inclusion & Social Justice	
[4] Mathematics & Quantitative Reasoning	
[5] Natural Science & Scientific Reasoning	
[6] Humanities	
[7] Social Sciences	
[8] Arts	
[9] US History & Civic Engagement	
[10] World History & Global Awareness	
[11] World Languages	

F. SEMESTER(S) OFFERED:

Fall	X
Spring	
Fall and 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.

H. PRE-REQUISITES: HVAC 101 and HVAC 102
CO-REQUISITES: HVAC 203

I. STUDENT LEARNING OUTCOMES:

Course Student Learning Outcome [SLO]	Program Student Learning Outcome [PSLO]	GER	ISLO & Subsets
a. Remove and replace components and function in commercial and industrial refrigeration applications			5-Ind, Prof, Disc, Know Skills
b. Demonstrate procedures for evacuating and recharging a refrigeration system.			5-Ind, Prof, Disc, Know Skills
c. Read and interpret pressure-enthalpy diagrams charts and scales			5-Ind, Prof, Disc, Know Skills
d. Demonstrate proper installation and service of refrigeration systems	3). Perform quality work that ensures safe and functional systems.		5-Ind, Prof, Disc, Know Skills
e. 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		5-Ind, Prof, Disc, Know Skills

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**

J. APPLIED LEARNING COMPONENT:

Yes	X
No	

If yes, select [X] one or more of the following categories:

Classroom / Lab	X	Community Service	
Internship		Civic Engagement	
Clinical Practicum		Creative Works/Senior Project	
Practicum		Research	
Service Learning		Entrepreneurship [program, class, project]	

K. TEXTS:

Andrew Althouse, *Modern Refrigeration and Air Conditioning*, 22nd edition, G-W Publishing.

L. REFERENCES:

M. EQUIPMENT:

N. GRADING METHOD:

A-F Grading

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Lab reports, projects & participation

P. DETAILED COURSE OUTLINE:

Q. LABORATORY OUTLINE:

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 unit