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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
HVAC102 – Refrigeration 1 Lab

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Canino School of Engineering Technology

Department: Mechanical & Energy Systems

Semester/Year: Fall 2021

A. **TITLE**: Refrigeration 1 Lab

B. **COURSE NUMBER:** HVAC102

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

 # Credit Hours: 2
 # Lecture Hours: **per week**
 # Lab Hours: 4 **per week**
Other: **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:**

Students apply knowledge of the basic refrigeration cycle and the function of each component; compressor, condenser, evaporator and metering device in laboratory experiments. 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:**

HVAC101

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. Select and operate basic service tools and equipment			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
2. Perform joining techniques to complete tubing and pipe connections			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
3. Introduction to the components and theory of basic electrical circuits			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
4. Demonstrate the ability to measure temperature and pressure using appropriate devices			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
5. Work with a diverse group, completing a common task			4-Soc Respons 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:

Lab Manual

L. REFERENCES:

M. EQUIPMENT: None ☐ Needed: NS101 & HVAC Tool List (Program website)

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Lab reports, projects and participation

P. DETAILED COURSE OUTLINE:

Q. LABORATORY OUTLINE: None ☐ Yes ☒

1. Introduction
1.1. Safety
1.2. Tools
2. Tubing Skills
2.1. Tube forming
2.2. Brazing
2.3. Assembly
3. Heat Transfer
3.1. Conduction, Convection, Radiation
3.2. Insulation
4. Change of State
4.1. Water
4.2. Steam ice
5. Refrigeration Cycle
5.1. Compressor
5.2. Condenser
5.3. Expansion
5.4. Evaporator
6. Pressure Measurement
6.1. Psi
6.2. Iwc
6.3. Feet of head
7. Refrigerant Handling
7.1. Moving refrigerants
7.2. Recovery

7.3. Charging basics
8. Single Phase Power
8.1. Safety/ isolation
8.2. Simple circuits
9. Low Voltage Control
9.1. Transformers
9.2. Relays
9.3. Thermostats