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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
HVAC202 – HVAC Electric Motors & Controls Lab

Created by: Michael J. Newtown, P.E.

Updated by: Stan Skowronek

Canino School of Engineering Technology !

Department: Mechanical & Energy Systems !

Semester/Year: Fall 2019 !

A. **TITLE**: HVAC Electric Motors & Controls Lab

B. **COURSE NUMBER:** HVAC202

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

 # Credit Hours: 2
 # Lecture Hours: **per week**
 # Lab Hours: (2) three-hour labs **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:**

This course develops hands-on skills at troubleshooting electrical faults, motors, and control sequences.

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

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

HVAC201

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.. Determine the voltage, amperage, resistance, and impedance of electrical circuits used in HVAC			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
2.Troubleshooting electrical faults in HVAC equipment.			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
3. Demonstrate proper installation of HVAC electrical controls and wiring.			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:

Cooper, William B., Raymond E. Lee, Raymond A. Quinlan, Martin W. Sirowatka, Warm Air Heating for Climate Control, 5th Edition, Prentice Hall, 2003

M. EQUIPMENT: None ☐ Needed:

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Lab reports, projects & participation

P. DETAILED COURSE OUTLINE:

N/A

Q. LABORATORY OUTLINE: None ☐ Yes ☒

1. **Ohms Laws**
2. **Proper use of multimeters**
3. **DC analysis of series circuits voltage**
4. **DC analysis of series circuits amperage**
5. **DC analysis of parallel circuits voltage**
6. **DC analysis of parallel circuits amperage**
7. **AC circuits measurement**
8. **Single phase circuits**
9. **Three phase circuits**
10. **Capacitors**
11. **Motor windings and measurement**
12. **Motor direction controls**
13. **Sequence operation of HVAC Appliances**

14. **Use of meters in troubleshooting**
15. **Replacement and installation of electrical panels**
16. **Troubleshooting digital control boards**
17. **Conduit bending and installation**
18. **Metal covered cable installation**
19. **Junction, handy, and switch boxes installation**
20. **Entrance panel and breaker box installation**