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 [x]

E. **GER CATEGORY:** None [ ] Yes: GER [x]
   
   *If course satisfies more than one:* GER [x]

F. **SEMESTER(S) OFFERED:** Fall [x] 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 [x] If yes, list below:

   HVAC201
I. **STUDENT LEARNING OUTCOMES: (see key below)**

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

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
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<tr>
<td>1. Determine the voltage, amperage, resistance, and impedance of electrical circuits used in HVAC</td>
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<td>3-Found Skills</td>
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<td>2. Troubleshooting electrical faults in HVAC equipment.</td>
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<td>3-Found Skills</td>
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<td>3. Demonstrate proper installation of HVAC electrical controls and wiring.</td>
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<td>3-Found Skills</td>
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<td>KEY</td>
<td>Institutional Student Learning Outcomes [ISLO 1 – 5]</td>
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<td>ISLO #</td>
<td>ISLO &amp; Subsets</td>
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</tbody>
</table>
| 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:

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