MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
HVAC205 – HVAC SERVICE, TROUBLESHOOTING & REPAIR

Created by: Stan Skowronek

Updated by:

Canino School of Engineering Technology!
Department: Mechanical & Energy Systems!
Semester/Year: Spring 2019!
A. **TITLE:** HVAC SERVICE, TROUBLESHOOTING & REPAIR

B. **COURSE NUMBER:** HVAC205

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

   # Credit Hours:  3  
   # Lecture Hours: 2 per week  
   # Lab Hours: (1) three-hour lab 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 covers the analysis and repair of HVAC systems. Students utilize electrical meters, pressure measuring equipment, and airflow testers to determine the performance of HVAC systems. Identification and repair of defective components is the focus of this course. Analysis of misapplication is also studied.

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

   CONS151, HVAC105

   **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:

<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>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explain components and functions in commercial and residential HVAC applications, relating them to building plans.</td>
<td>3-Found Skills</td>
<td>ISLO ISLO</td>
<td>Subsets Subsets Subsets</td>
</tr>
<tr>
<td>2. Explain and perform the proper procedures used in installing components, field piping, and field wiring.</td>
<td>3-Found Skills</td>
<td>ISLO ISLO</td>
<td>Subsets Subsets Subsets</td>
</tr>
<tr>
<td>3. Demonstrate procedures for evacuating and recharging a refrigeration system</td>
<td>3-Found Skills</td>
<td>ISLO ISLO</td>
<td>Subsets Subsets Subsets</td>
</tr>
<tr>
<td>4. Demonstrate procedures for starting up newly installed HVAC equipment</td>
<td>3-Found Skills</td>
<td>ISLO ISLO</td>
<td>Subsets Subsets Subsets</td>
</tr>
<tr>
<td>5. Demonstrate the evaluation of operating HVAC equipment</td>
<td>3-Found Skills</td>
<td>ISLO ISLO</td>
<td>Subsets Subsets Subsets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ISLO ISLO</td>
<td>Subsets Subsets Subsets</td>
</tr>
<tr>
<td>ISLO</td>
<td>ISLO</td>
<td>ISLO</td>
<td>Subsets</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>ISLO</td>
<td>ISLO</td>
<td>ISLO</td>
<td>Subsets</td>
</tr>
<tr>
<td>ISLO</td>
<td>ISLO</td>
<td>ISLO</td>
<td>Subsets</td>
</tr>
<tr>
<td>ISLO</td>
<td>ISLO</td>
<td>ISLO</td>
<td>Subsets</td>
</tr>
<tr>
<td>ISLO</td>
<td>ISLO</td>
<td>ISLO</td>
<td>Subsets</td>
</tr>
<tr>
<td>KEY</td>
<td>Institutional Student Learning Outcomes [ISLO 1 – 5]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISLO #</td>
<td>ISLO &amp; Subsets</td>
<td></td>
<td></td>
</tr>
</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  ☐ Civic Engagement
   ☐ Internship     ☐ Creative Works/Senior Project
   ☐ Clinical Placement ☐ Research
   ☐ Practicum      ☐ Entrepreneurship
   ☐ Service Learning (program, class, project)
   ☐ Community Service

K. **TEXTS:**


L. **REFERENCES:**

M. **EQUIPMENT:** None ☐  **Needed:** HVAC Tool List (program website)

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

   Exams, Quizzes, Homework, Lab reports & participation

P. **DETAILED COURSE OUTLINE:**

1. Split Systems
   1.1. Gas furnaces
   1.2. Cased AC split systems
   1.3. Mini splits
   1.4. Oil furnaces
   1.5. Electric air handlers
   1.6. Split system controls
2. Packaged units
   2.1. Field wiring
   2.2. Field piping
   2.3. Ductwork attachment
   2.4. Packaged heat pumps
3. Air Handlers
   3.1. DX/ Gas systems
   3.2. Chilled water/ Gas systems
   3.3. Fan maintenance
   3.4. Economizers
   3.5. Commercial controls
Q. LABORATORY OUTLINE: None ☐ Yes ☑

1. Gas furnace testing and trouble shooting
2. Oil furnace testing and trouble shooting
3. Cased AC split system testing and trouble shooting
4. Mini split faults and diagnoses
5. Unitarian units testing and diagnoses
6. Trouble shooting wiring shorts
7. Commercial Systems diagnoses
  7.1. DX systems
  7.2. Chillers
  7.3. Absorption units
  7.4. Heat exchangers