

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



**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:

<b><u>Course Student Learning Outcome</u></b> <b><u>[SLO]</u></b>	<b><u>Program Student Learning Outcome</u></b> <b><u>[PSLO]</u></b>	<b><u>GER</u></b> <i>[If Applicable]</i>	<b><u>ISLO &amp; SUBSETS</u></b>	
1.Explain components and functions in commercial and residential HVAC applications, relating them to building plans.			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
2. Explain and perform the proper procedures used in installing components, field piping, and field wiring.			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
3. Demonstrate procedures for evacuating and recharging a refrigeration system			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
4. Demonstrate procedures for starting up newly installed HVAC equipment			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
5. Demonstrate the evaluation of operating HVAC equipment			3-Found Skills ISLO ISLO	Subsets Subsets Subsets Subsets
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<b>KEY</b>	<b><u>Institutional Student Learning Outcomes [ISLO 1 – 5]</u></b>
<b>ISLO #</b>	<b>ISLO &amp; Subsets</b>
<b>1</b>	<b>Communication Skills</b> Oral [O], Written [W]
<b>2</b>	<b>Critical Thinking</b> <i>Critical Analysis [CA] , Inquiry &amp; Analysis [IA] , Problem Solving [PS]</i>
<b>3</b>	<b>Foundational Skills</b> <i>Information Management [IM], Quantitative Lit./Reasoning [QTR]</i>
<b>4</b>	<b>Social Responsibility</b> <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
<b>5</b>	<b>Industry, Professional, Discipline Specific Knowledge and Skills</b>

\*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:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Classroom/Lab | <input type="checkbox"/> Civic Engagement              |
| <input type="checkbox"/> Internship               | <input type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement       | <input type="checkbox"/> Research                      |
| <input type="checkbox"/> Practicum                | <input type="checkbox"/> Entrepreneurship              |
| <input type="checkbox"/> Service Learning         | (program, class, project)                              |
| <input type="checkbox"/> Community Service        |  |

K. **TEXTS:**

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

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