# HVAC/R SYSTEM INSTALLATION & START-UP RESIDENTIAL
## Course Syllabus

<table>
<thead>
<tr>
<th>Course Number:</th>
<th>ARCO-1181</th>
<th>OHLAP Credit:</th>
<th>No</th>
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<tbody>
<tr>
<td>OCAS Code:</td>
<td>None</td>
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<tr>
<td>Course Length:</td>
<td>120 Hours</td>
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<tr>
<td>Career Cluster:</td>
<td>Architecture &amp; Construction</td>
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<tr>
<td>Career Pathway:</td>
<td>Maintenance/Operations</td>
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<tr>
<td>Career Major(s):</td>
<td>HVAC Technician</td>
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### Pre-requisite(s): Air Handling, Heating Systems, Refrigerants and Lubricants, Refrigerant Recovery, Refrigerant System Components

### Course Description:
This course covers the essential knowledge and skills necessary to use the manufacturer's literature to properly install and start-up common residential HVAC/R equipment. Special attention will be given to a thorough understanding of the refrigeration cycle and equipment, heating systems, air flow and balancing systems, air quality issues, and building codes that regulate the HVAC/R industry in residential applications. Emphasis will be placed on confirming proper operation for safety, efficiency, and reliability. Minor troubleshooting and repair skills will be covered.

### Textbooks:
- **Refrigeration & Air Conditioning Technology, 7th Ed, (2013),** Whitman /Johnson/ Tomczyk Silberstein / Publisher Delmar Cengage

### Course Objectives:

**A. Understand Heating Start-up, Checkout, and Operation.**
1. Understand the importance of manufacturers' installation and operation requirements.
2. Demonstrate use of tools and instruments.
3. Determine equipment electrical, mechanical and code requirements.
4. Verify equipment air flow and distribution requirements.
5. Check operation of all electrical control components.
6. Check operation of gas train components and measurements.
7. Check oil burner components and measurements.
8. Check ignition systems.
9. Evaluate fuel supply systems.
10. Test for proper combustion.
11. Check electrical components for operation and wiring connections.
12. Check for correct heating input and adjust to manufacturers' specifications.

**B. Understand Heat Pump Start-up, Checkout, and Operation.**
1. Understand the importance of manufacturers' installation and operation
requirements.¹
2. Understand alternative fuel methods.¹
3. Demonstrate use of tools and test equipment.¹
4. Determine equipment electrical requirements.¹
5. Verify equipment air flow and distribution.¹
6. Check operation of all electrical and mechanical components.¹
7. Check system operation in the heating, cooling and defrost modes.¹
8. Check supplementary and emergency heat.¹
9. Instruct customer on operation and maintenance of system.¹

C. Understand Air Conditioning Start-up, Checkout, and Operation.
1. Understand the importance of manufacturers' installation and operation
   requirements.¹
2. Demonstrate use of tools and test equipment.¹
3. Determine equipment electrical requirements.¹
4. Verify equipment air flow and distribution requirements.¹
5. Check operation of all electrical and mechanical components.¹
6. Check system operation while following all safety procedures.¹
7. Pull and verify deep vacuum.¹
8. Perform leak check and make repairs.¹
9. Conform to all applicable governmental regulations.¹

¹ODCTE objective

Teaching Methods: The class will primarily be taught by the lecture and demonstration method and supported by
various media materials to address various learning styles. There will be question and answer
sessions over material covered in lecture and media presentations. Supervised lab time is
provided for students to complete required projects.

Grading Procedures: 1. Students are graded on theory and shop practice and performance.
2. Each course must be passed with seventy (70%) percent or better.
3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

Description of Classroom, Laboratories, and Equipment: Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center
School District No. 18. All programs provide students the opportunity to work with
professionally certified instructors in modern, well-equipped facilities.

Available Certifications/ College Credit The student may be eligible to take state, national or industry exam after completion of the
program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa
Community College. See program counselor for additional information.

College Credit Eligibility: The student must maintain a grade point average of 2.0 or better.