HVAC/R PREVENTIVE MAINTENANCE
Course Syllabus

Course Number: ARCO-1190
OCAS Code: None
Course Length: 15 Hours
Career Cluster: Architecture & Construction
Career Pathway: Maintenance/Operations
Career Major(s): HVAC Technician

Pre-requisite(s): Introduction to HVAC/R Safety, Tools and Equipment; Refrigerants and Lubricants; Refrigerant Recovery; Refrigerant System Components; Air Handling

Course Description: This course covers the essential knowledge and skills necessary to use the manufacturer's literature to properly service common residential HVAC/R equipment. 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 Basic Maintenance.

1. Explain the various types of maintenance programs.¹
2. Explain broad tasks and frequencies for a quality maintenance program.¹
3. Explain why each step of the Preventative Maintenance Program is necessary.¹
4. Explain the benefits associated with proper equipment maintenance.¹
5. Demonstrate various maintenance tasks.¹
6. Develop a Preventative Maintenance Program for:¹
   a. Absorption cooling unit¹
   b. Electric heat system¹
   c. Gas heat system¹
   d. Heat pump system¹
   e. Hydronic systems¹
   f. Ice makers¹
   g. Oil heat system¹
   h. Package heat and cooling unit¹
   i. Refrigeration systems¹
   j. Split system condensing unit and evaporator¹
   k. Walk-in boxes¹
   l. Water-cooled centrifugal chiller¹
HVAC/R PREVENTIVE MAINTENANCE

m. Water-cooled reciprocating chiller\(^1\)
7. Develop a list of tools needed to perform the Preventative Maintenance Program.\(^1\)
8. Develop a Preventative Maintenance Check Sheet.\(^1\)

B. **Develop Maintenance Skills for the Service Technician.**
1. Identify the types of threaded and nonthreaded fasteners and explain their use.\(^2\)
2. Install threaded and non-threaded fasteners.\(^2\)
3. Identify the types of gaskets, packings, and seals and explain their use.\(^2\)
4. Remove and install gaskets, packings, and seals.\(^2\)
5. Identify the types of lubricants and explain their use.\(^2\)
6. Use lubrication equipment to lubricate motor bearings.\(^2\)
7. Identify the types of belt drives and explain their use.\(^2\)
8. Demonstrate and/or explain procedures used to install or adjust a belt drive.\(^2\)
9. Identify the types of couplings and explain their use.\(^2\)
10. Demonstrate and/or explain procedures used to remove, install, and align couplings.\(^2\)
11. Identify the types of bearings and explain their use.\(^2\)
12. Explain causes of bearing failures.\(^2\)
13. Demonstrate and/or explain procedures used to remove and install bearings.\(^2\)
14. Perform basic preventive maintenance inspection and cleaning procedures.\(^2\)
15. List work and personal habits that contribute to good customer relations.\(^2\)
16. Identify steps in the handling of a typical service call that will contribute to good customer relations.\(^2\)
17. Legibly fill out forms used for installation and service calls.\(^2\)

C. **Understand Planned Maintenance.**
1. Describe planned maintenance and service procedures required for selected HVAC equipment and components.\(^2\)
2. Develop a planned maintenance and service checklist for selected HVAC equipment and accessories.\(^2\)
3. Perform identified service and maintenance tasks on selected HVAC equipment, components, and accessories.\(^2\)
4. Identify the tools and materials necessary for performing service and maintenance tasks.\(^2\)
5. State the safety practices associated with the servicing of selected HVAC equipment, components, and accessories.\(^2\)

\(^1\) ODCTE objective
\(^2\) NCCER 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%.
HVAC/R PREVENTIVE MAINTENANCE

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.