

APRT 141B: TROUBLESHOOTING DIAGNOSIS & REPAIR FOR RESIDENTIAL HVAC SERVICE

Foothill College Course Outline of Record

| Heading | Value |
|-------------------------|--|
| Units: | 2.5 |
| Hours: | 24 lecture, 30 laboratory per quarter (54 total per quarter) |
| Prerequisite: | Per California Code of Regulations, this course is limited to students admitted to the Sheet Metal Residential Service Apprenticeship Program. |
| Degree & Credit Status: | Degree-Applicable Credit Course |
| Foothill GE: | Non-GE |
| Transferable: | None |
| Grade Type: | Letter Grade (Request for Pass/No Pass) |
| Repeatability: | Not Repeatable |

Student Learning Outcomes

- A student will be able to test and trace electrical circuits.
- A student will be able to change out a small refrigeration compressor.

Description

Troubleshooting approaches for HVAC equipment problems, with diagnosis and repair. Testing and tracing of circuits; visual evaluations for electrical and mechanical HVAC equipment. Review and practice of all basic skills necessary for A/C residential service technicians.

Course Objectives

The student will be able to:

- Discuss troubleshooting approaches for furnace, air conditioner and heat pump problems.
- Perform visual electrical and mechanical evaluations.
- Test and trace electrical circuits.
- Describe compressor functions and failures.
- Change out refrigerant compressors.

Course Content

- Discuss troubleshooting approaches for furnace, air conditioner and heat pump problems
 - Diagnosis and repair of furnaces; electrical and mechanical approaches
 - Diagnosis and repair of electrical heaters and electric filters
 - Troubleshooting air conditioning and heat pumps problems
- Perform visual electrical and mechanical evaluations
 - Access and visual overview of circuit and mechanical components
 - Check for wiring disconnections, evidence of malfunction, shorts, and proper mechanical functions of components
- Test and trace electrical circuits

- Initial testing without disconnection
- Describe when and how to test for current flow versus continuity/equipment usage
- Change out refrigerant compressors
- Describe compressor functions and failures
- Review of electrical and refrigeration systems; test 1. Condemnation and change-out of compressors

Lab Content

- Practice troubleshooting of residential HVAC equipment
- Practice repairing of residential HVAC equipment

Special Facilities and/or Equipment

Laboratory equipped with air conditioning equipment.

Method(s) of Evaluation

- Results of written quizzes and tests
- Satisfactory completion of shop projects
- Comprehensive written final examination
- Maintenance of a workbook of student's daily work activities

Method(s) of Instruction

- Lecture
- Discussion
- Laboratory
- Demonstration

Representative Text(s) and Other Materials

International Training Institute for the Sheet Metal and Air Conditioning Industry. Residential HVAC Service Technician. International Training Institute, 2007.

NOTE: This is the standard Sheet Metal textbook/workbook used for this course. Although it may not be within 5 years of the required published date, it is the most current book used when teaching this course.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

- Readings from textbook on diagnosing residential HVAC system problems using Electrical Diagrams
- Writing assignments given in the laboratory
 - Review questions regarding diagnosing compressor circuit problems

Discipline(s)

Air Conditioning, Refrigeration, Heating