Washtenaw Community College Comprehensive Report

UAT 267 Advanced HVAC & R Troubleshooting
Effective Term: Fall 2020

Course Cover

Division: Advanced Technologies and Public Service Careers
Department: United Association Department
Discipline: United Association Training
Course Number: 267
Org Number: 28200
Full Course Title: Advanced HVAC & R Troubleshooting
Transcript Title: Adv. HVAC & R Troubleshooting
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Web Page
Reason for Submission: Course Change
Change Information:
Consultation with all departments affected by this course is required.
Course description
Outcomes/Assessment
Objectives/Evaluation
Rationale: Update United Association course
Proposed Start Semester: Spring/Summer 2020
Course Description: In this course, students will study basic electricity as it applies to Heating, Ventilation, Air Conditioning, and Refrigeration (HVACR) systems. Students will review electrical theory, including voltage, amperage, resistance, and wiring schematics, with an emphasis on safely troubleshooting HVACR and plumbing control systems. In addition, students will demonstrate these techniques with online resources as well as trainers in a hands-on lab environment. Limited to United Association program participants.

Course Credit Hours

Variable hours: No
Credits: 1.5
The following Lecture Hour fields are not divisible by 15: Student Min ,Instructor Min
Lecture Hours: Instructor: 22.5 **Student:** 22.5
The following Lab fields are not divisible by 15: Student Min, Instructor Min
Lab: Instructor: 1.5 **Student:** 1.5
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 24 **Student:** 24
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites

General Education

Degree Attributes

Below College Level Pre-Reqs

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Identify electrical theory, voltage, amperage, resistance, impedance, and power related to HVACR.
   Assessment 1
   Assessment Tool: Outcome-related multiple-choice quiz questions
   Assessment Date: Fall 2020
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Answer key
   Standard of success to be used for this assessment: 80% of the students will score 80% or higher.
   Who will score and analyze the data: U.A. instructors

2. Demonstrate safety and troubleshooting skills for HVACR electrical circuits and trainers.
   Assessment 1
   Assessment Tool: Skills demonstration
   Assessment Date: Fall 2020
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Skills checklist
   Standard of success to be used for this assessment: 80% of the students will score 80% or higher.
   Who will score and analyze the data: U.A. instructors

3. Demonstrate the use of online instructional resources including UA Online Learning Resources (UAOLR) including Blackboard, Basic Electricity Circuit Builder, FreeForm Circuit Builder and Design/Draw Control Circuit Diagrams.
   Assessment 1
   Assessment Tool: Skills demonstration
   Assessment Date: Fall 2020
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All
   Number students to be assessed: All
   How the assessment will be scored: Skills checklist
   Standard of success to be used for this assessment: 80% of the students will score 80% or higher.
   Who will score and analyze the data: U.A. instructors

Course Objectives

1. Review electrical symbols and types of circuits when reading wiring diagrams and schematics.
2. Discuss the basics of electrical theory and terminology including voltage, amperage, resistance, impedance, and power.
3. Discuss the concepts of electricity as related to HVACR and plumbing controls.

4. Discuss electrical safety and the personal protection equipment (PPE) required when working with live electrical circuits.
5. Identify safety requirements for pre-determined troubleshooting scenarios for low and high voltage circuits.
6. Navigate the UAOLR and Blackboard for content, use, and activities available for students and use at their local Training Centers.
7. Create and design Solve Control Circuits utilizing FreeForm Circuit Builder software.
8. Navigate Blackboard course for troubleshooting scenarios, repair equipment exercises, and course quizzes.
9. Complete Basic Electricity Circuit Builder Interactive exercises applying the relevant formulas.
10. Utilize FreeForm Circuit Builder software for drawing control circuits with MS Office.
11. Work as a group to design and draw a conceptual control circuit.
12. Work as a group to build a control circuit using control components of the GBT Electrical Trainer.

New Resources for Course

Course Textbooks/Resources

Textbooks

International Association of Plumbing and Mechanical Officials. *Electrical Controls for Mechanical Equipment Service* , First ed. IAPMO Group, 2006

International Association of Plumbing and Mechanical Officials. *Basic Electricity*, First ed. IAPMO Group, 2015

Manuals

Periodicals

Software

Equipment/Facilities

Reviewer	Action	Date
Faculty Preparer:		
Tony Esposito	*Faculty Preparer*	*May 12, 2020*
Department Chair/Area Director:		
Marilyn Donham	*Recommend Approval*	*May 20, 2020*
Dean:		
Jimmie Baber	*Recommend Approval*	*May 27, 2020*
Curriculum Committee Chair:		
Lisa Veasey	*Recommend Approval*	*Sep 25, 2020*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*Sep 30, 2020*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Oct 06, 2020*