HVAC U – HVAC Technician Program Basic Electricity

I. Office Location: 18311 W 10 W Mile Rd STE 103, Southfield MI 48075
II. Office Phone: 248-450-3105
III. Email Address: info@hvatrain.com
IV. Contact Hours: 60 Hours
V. Prerequisite: None
VI. Co-requisites: None
VII. Grading Scale: A to E

Catalog Course Description:

Covers the fundamentals of DC and AC circuits and circuit calculations. Examines electrical definitions, units of electrical measure, use of meters, series and parallel resistive circuits, capacitance, and inductance. Also explores basic wiring techniques and how to troubleshoot circuit faults. Extensive laboratory activities. Extensive laboratory activities.

Goals, Topics, and Objectives

Goal Statement

This course provides students with the capability to meet or exceed the requirements for entry-level multifunctional residential and light commercial service technicians. It covers National Skills Standards requirements as specified by several nationally recognized heating/cooling field including ARI/GAMA and VTECS. It further provides the student with readily applicable workplace skills to minimize entry training into the field. Completion of this course will count towards BPI, NATE, and RSES continuous education credits.

Core Course Topics and Objectives

Upon successful completion of this course, students should be able to perform the following:

1. Describe concepts of basic electricity theory; and define terms voltage, current, resistance, and power.
2. Demonstrate in labs and on exams basic electrical safety.
3. Demonstrate Ohm's law and power calculations in an electrical circuit.
4. Describe concepts of series and parallel circuits and explain the differences between them.
5. Describe concepts of capacitance and inductance.
6. Describe concepts of AC theory and be able to differentiate it from DC.
7. Demonstrate a working knowledge of how and why conductor size and type affect the flow of current; be able to calculate proper conductor size in a circuit.
8. Demonstrate transformers, resistors, and relays/contactors usage.
9. Explain single-phase current and three-phase current.
10. Calculate line loss in an electrical conductor, good conductors vs. poor conductors, and semi-conductors.
11. Perform electrical troubleshooting on HVACR Appliances

Course Outline:

1. Electrical Safety
2. Alternating Current Generation, Power Distribution, and Voltages

3. Electric Services
4. Electric Circuits
5. Instruments
6. Reading Electric Wiring Diagrams
7. Midterm
8. Electric Motors
9. Contactors, Relays, and Starters
10. Thermostats and HVAC Controls
11. Residential Heating Systems
12. Residential Cooling Systems
13. Troubleshooting HVACR Systems
14. Final Exams

Lab Activities:

To maximize the effectiveness of personal learning, there will be labs activities as well as hands on field experience. You will be assigned a sponsoring contractor and will be required to complete 20 hours of in field shadowing.

Course Assessment:

Methods for measuring achievement of objectives:

1. Quizzes – Quizzes will be given throughout the semester. Quiz scores represent 20% of the course grade. Quizzes can be issues online or in class, instructor's discretion.
2. Laboratory Activities – Lab activities vary from in person labs or job shadowing. These will make up 20% of the course grade. Students must attend the sessions as assigned to receive credit.
3. Homework – Homework will consist of assignments based on the textbook's chapters. Homework will also consist of any materials that are provided by the instructor. These assignments will make up 20% if the course grade.
4. Exams – A written midterm and final exam will be given and totally they will represent the 20% of the course grade.
5. Attendance – Attendance will account for 20% of the final grade. Absence from class is part of not com pleting the required work, so each absence will result in a deduction of the final grade. This will only be explained once; if you cannot make it to class you make early arrangements with the instructor or call and leave a message on his phone or e-mail. All assigned work will be completed by the end of the semester, or a grade of Incomplete will be given.

Grading Scale:

1. 100 – 90% = A
2. 89 – 80% = B
3. 79 – 70% = C
4. 69- 63% = D
5. 63 – Below - F

Class Textbook:

Electricity for the Refrigeration, Heating and Air Conditioning 10th Edition – Required

Russell E. Smith

ISBN – 13: 978-1-337-39912-8

The textbook will be provided

Attendance Policy:

Maximum allowable number of absences is 3. The 4th class means automatic failure, but the class can still be attended. Tardiness and leaving early added up to 60 minutes will be counted as an absence.

Attire:

Appropriate clothing should be always worn. When showing a specific contractor please consult with them for their specific requirements.

Cheating and Plagiarism:

You are the student so; the work should be your own. You are not cheating anyone other than yourself and your work performance in industry, will be reflected by your what you learn in the classes.

Cell Phone Usage:

Please refrain from cell phone use in class. If cell phone usage is abused you will be asked to leave.

Intoxication/Drugs:

HVAC U, LLC has a zero-tolerance policy regarding intoxication or drugs. If evidence of either is recognized, campus security will be requested to remove you from the premises and might involve associated required tests by law enforcement agencies. Do not come to campus or class because of the possibility of endangerment to other students and staff. Additionally, the contractors in this program will require you to be drug tested prior to job showing.

ADA:

HVAC U, LLC will make necessary specific accommodations, to those students of record at HVAC U, LLC with identified ADA needs.

Dropping the class:

We provide 100% refund after the 1st week of class. After the 1st initial week, no refunds will be given. Credit for class may be granted on a case-by-case basis. Please contact the training director for specific details.

Tuition Cost:

$2279.00