HVAC IIA-Fall 2024 (HVAC 1210)

Welcome back to the HVAC Apprenticeship program! Congratulations on beginning your second year.

I understand you are a busy person, successful people are, and I strongly encourage you to set aside the time you will need to learn and master the content within each module. To facilitate this, establish a study schedule and stick to it. If you are substantially engaged in the textbooks and Pearson online materials, on a near-daily basis, your study habits will improve and your knowledge and skills will increase.

This semester, we will explore AC power generation, transformers, and electric motors. You will also learn about the various types of refrigeration compressors and their operation and control. We will continue to study refrigerants, charging, evacuation, and also learn about the different lubricants used in refrigeration systems. Refrigerant metering devices, Indoor Air Quality (IAQ), and an introduction to the properties of air will round out the semester.

Attendance and engagement in the online material is critical to your success in this course. Particularly, attendance is a requirement and metric used to determine successful completion of your apprenticeship program. As per the requirements set forth in 29 CFR 29.5 Standards of Apprenticeship paragraph (b)(4), each apprentice must successfully complete a minimum of 144 hours of related and supplemental instruction each year of Apprenticeship (72 hours for each of two semesters). Each core semester-long course (HVAC IA, IB, IIA, IIB, etc.) will provide 75 hours each semester to meet the requirement of this federal standard. This 75 hours is arrived at by attending a 2.5-hour lecture once a week for 15 weeks in addition to 2.5 hours of online work each week via a Learning Management System (LMS) provided by our textbook publisher and also Canvas, a LMS used at SLCC. This means you can only miss one class period each semester, while still completing all of the online work, and pass this course.

Instructors are required to record attendance each class period. It is your responsibility to ensure you have enough clock hours to successfully complete the course. Students with insufficient clock hours will not be permitted to sit for the comprehensive Final Exam at the end of the semester. These students will receive a failing grade and be required to re-take the course prior to moving forward in their apprenticeship.

Final Exam – A comprehensive final will be administered at the end of each semester. This comprehensive exam may include any information covered during the semester. This will be a 60-question multiple-choice exam and must be completed within two hours. This exam will account for a major portion (25%) of your final grade. Other than a calculator and a writing utensil, no other items will be allowed during testing. (A TI-30 calculator or equivalent is recommended. Graphing or programmable calculators are not permitted. Construction Master, Electrical Pro, Project Master, or other similar calculators are not permitted. Calculators on cell phones are not allowed to be used during quizzes and exams.) This exam will account for 25% of the final grade for the class. If the student scores less than 70% on the exam, the score will be recorded as a 0 (zero).

Pay close attention to the schedule outlined below and be prepared (read the material and write down questions to ask) for the lecture. As the semester progresses, there could be a need to adjust the schedule. I will use the email function in Canvas to communicate schedule changes and reminders to the

class. All assignments and quizzes in Pearson and Canvas must be completed by the due date in order to receive credit. We will meet for lecture in TAB-112 and lab activities in TAB-109.

The required textbook for this semester is *Heating, Ventilating, and Air* Conditioning, Level 2, 5th edition. This text may be available in the SLCC bookstore, if not, it is available on Amazon.com and Pearson.com. Use ISBN 0-13-518512-2 or ISBN 978-0-13-518512-4 to search and verify you are purchasing the correct textbook. I highly recommend purchasing this book instead of renting it. Some of the offerings include the access code for the online material; the access code is also required. If your book does not come with the access code, you can pay for access to the online material during the registration process below. You will also need the following hand tools and meters for the labs:

- HVACR Clamp Multi-Meter UEI DL479 or similar available at some supply houses or Amazon.
- 6 in 1 screwdriver (#1 and #2 Phillips screwdrivers, 1/4" and 3/16" slotted screwdrivers, 1/4" and 5/16" nut-drivers)
- Small 1/8" flat-blade screwdriver (control screwdriver) used for installing thermostats and other control devices.
- Adjustable open-end wrench, 6"
- Adjustable open-end wrench, 8"
- Two pocket thermometers, UEI PDT650 or similar
- Magnet (approx. 2"X3/4"X1/2") or The Old Switcheroo (Google to find source)
- Refrigeration service wrench, Yellow Jacket model 60613 or similar
- Measuring tape, at least 16'
- Electrical tape
- Tubing cutter, Rigid model 150 or similar
- Deburring tool, Yellow Jacket model 60163 or similar

We will be using a Learning Management System (LMS) on the website of our textbook's publisher—Pearson. All textbook-related assignments, and exam preparation materials, will only be available via this LMS. To be successful in this course, you must register for this course on Pearson's website and access this course frequently to supplement your study of the textbook.

To register for HVAC 1210:

1. Go to
2. Sign in with your Pearson student account or create your account.
3. Select any available access option, if asked.
    - Enter a prepaid access code that came with your textbook or from the bookstore.
    - Buy instant access using a credit card or PayPal.
    - Select Get temporary access without payment for 14 days.
4. Select Go to my course.

5. Select HVAC 1210 from My Courses.

If you contact Pearson Support, give them the course ID:

To sign in later:

1. Go to https://mlm.pearson.com.
2. Sign in with the same Pearson account you used before.
3. Select HVAC 1210 from My Courses.

The following schedule will be our guide to learning this semester. As usual, there are assignments in Pearson for each module. Due to their nature, scheduled labs will be performed as a class and cannot be made up.

August 21, 2024	HVAC IIA Introduction
	Module 1 Section 1 AC Power Generation and Uses
	Canvas—Module 1 Assignments and quizzes.
August 28, 2024	Module 1 Section 2 Transformers
	Module 1 Section 3 Induction Motors
	Module 1 Section 4 Testing AC Components
September 4, 2024	Module 1 Review
	Electrical Measuring Lab
	Module 2 Section 1 Compressor Types and Operating Characteristics
September 11, 2024	Module 1 Exam
	Module 2 Section 2 Compressor Capacity Control
	Module 2 Section 3 Common Causes of Compressor Failures
	Canvas—Module 2 Assignments and quizzes.
September 18, 2024	Module 2 Section 4 Compressor Protection Devices
	Module 2 Section 5 Hermetic Compressor Analysis
	Module 2 Review
September 25, 2024	Module 2 Exam

	Module 3 Section 1 Refrigerant Characteristics
	Module 3 Section 2 Refrigerant Types and Classifications
	Canvas—Module 3 Assignments and quizzes.
October 2, 2024	Module 3 Section 3 Pressure-Temperature Charts
	Module 3 Section 4 Lubricating Oils
	Module 3 Section 5 Refrigerant Conversions
October 9, 2024	Module 3 Review
	Module 4 Section 1 Refrigerant Leak Testing and Location
	Module 4 Section 2 Refrigerant Containment
	Canvas—Module 4 Assignments and quizzes
October 16, 2024	Module 3 Exam
	Module 4 Section 3 Refrigerant Circuit Evacuation
	Module 4 Section 4 Refrigerant Charging
October 23, 2024	Module 4 Review
	Lab Activities: Refrigerant Leak Detection, Refrigerant Recovery, Circuit Evacuation, and Refrigerant Charging.
October 30, 2024	Module 4 Exam
	Module 5 Section 1 Metering Devices
	Module 5 Section 2 Fixed Metering Devices
	Module 5 Section 3 Expansion Valves
	Canvas—Module 5 Assignments and quizzes.
November 6, 2024	Module 5 Section 4 Expansion Valve Selection and Installation
	Module 5 Review
	Module 5 Lab Activities: Metering Devices
November 13,2024	Module 5 Exam
	Module 12 Section 1 Indoor Air Quality
	Module 12 Humidity Control
	Canvas—Module 12 Assignments and quizzes.
November 20, 2024	Module 12 Section 3 Air Cleanliness Equipment

	Module 12 Review
November 27, 2024	No Class—Happy Thanksgiving
December 4, 2024	Module 12 Exam
	Course Review and Final Exam Preparation
December 11, 2024	Final Exam

Your final grade for the semester will be calculated as follows:

Assignments and Labs	35% of final grade
Module Exams	40% of final grade
Final Exam	25% of final grade

The following grading standards will be used in this class:

Grade	Range
A	100% to 94%
A-	< 94% to 90%
B+	< 90% to 87%
B	< 87% to 84%
B-	< 84% to 80%
C+	< 80% to 77%
C	< 77% to 74%
E	< 74% to 0%