

PHCC Educational Foundation
E-Learning
Plumbing 401 Syllabus

Primary Course Contact

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Office Hours: 9:00 a.m. to 3:00 p.m. ET Tuesday through Thursday.

Prerequisites

Plumbing 101, 201 and 301 or equivalent

Welcome to the PHCC Educational Foundation's Plumbing Online Apprenticeship-Related Instruction Program!

This program is designed to provide students who cannot attend classes in a traditional apprentice program with the same opportunity to learn the textbook fundamentals of the trade. This training course must be supplemented by your employer, through both technical assistance and on-the-job training in each area of instruction in the book.

Course Goals

- To familiarize students with service and repair techniques
- To provide students with an understanding of system sizing using blueprint reading techniques
- To familiarize students with methods for protecting the water supply
- To introduce students to heating systems and techniques
- To provide students with an understanding of pumps
- To familiarize students with the plumbing code and its application in field work

Course Policies and Instructions

It is the student's responsibility to ensure that this course is an acceptable form of apprenticeship training in his/her state.

The student must complete the enrollment form and pay for the course before a program can be delivered.

To maintain continuity, it is recommended that at least one unit be completed and one test be submitted each month. **There is a maximum time limit of 12 months to complete the program.** Exceptions to the time limit may be made at the discretion of the Director of Apprentice & Journeyman Training.

The student is solely responsible for completing his or her work in a timely manner and for requesting any extensions for completing the course. Students who have not submitted a unit test

in 60 days will receive a warning notice by mail requiring them to complete a minimum of one unit test within 30 days to remain active in the program. Students failing to submit a unit test for 90 consecutive days will be dropped from the program. If the student is dropped from the program, the student forfeits all money paid for the program and receives no credit for the portion completed.

Students in good standing (with an average test grade of 70% or higher) dropped from the program may reinstate their registration and resume studies within 6 months of the date dropped by paying a \$100 reinstatement fee.

No refunds are available on this course.

All tests are closed-book and are taken on the honor system. Students are expected to submit original work at all times. Any answers on a test that are verbatim from the textbook will be marked incorrect and no credit will be given. Students violating this policy are subject to removal from the program at the discretion of the PHCC Educational Foundation. All students removed from the program are ineligible for refunds and may not be reinstated in the program under any circumstances.

On-the-job training must be coordinated with the student's employer. **On-the-job training is the responsibility of the apprentice and his/her sponsor.** The apprentice and employer are responsible for maintaining accurate records of on-the-job training and supplying those to the appropriate state apprenticeship agency as required in the state where the apprentice is registered.

Due to varying state requirements for licensing, students are limited to enrollment in one course per calendar year. Exceptions may be made on a case-by-case basis. Requests for waivers to this policy must be made in writing to: Merry Beth Hall, Director of Apprentice & Journeyman Training, PHCC Educational Foundation, 180 S. Washington St., Ste. 100, Falls Church, VA 22046.

Course Requirements & Grading

In order to successfully complete this course, each student must complete all assignments including:

- Reading assignments
- Three discussion board assignments
- Three drawing assignments
- One business math assignment
- Eight unit tests
- One final project
- One final exam

Online tests need instructor review and will be graded and returned within 7 days from the date submitted. In the case of tests or assignments with drawings, please allow up to 30 days for tests to be graded and returned. If you have not received your graded test within 30 days, please contact us at 800-533-7694 or by email at vasquez@naphcc.org.

Please note that online tests may show an answer as incorrect when it is actually correct. This occurs with fill in the blank and short answer questions. The software is not intuitive and spelling errors or verbiage not exactly like the answer key trigger the software to mark an answer wrong when it is not. The instructor will review all tests to override the software errors so your grade is correct. Please allow up to 7 days from the date submitted for the instructor to review your test.

Students and their employers are responsible for maintaining records for on-the-job training as required by the state in which they are regulated. Upon request, the PHCC Educational Foundation will provide student progress reports on the home study (apprenticeship-related instruction) portion of the apprenticeship to the appropriate state licensing entity.

All assignments must be completed in order to finish and pass the course.

Students are required to achieve a passing grade of 70% on each test. In the case of a score lower than 70%, a test may be re-taken after the student reviews the unit again and is prepared to re-take the exam. Students must contact the instructor to re-take the exam (vasquez@naphcc.org) and must wait at least 10 days from the previous attempt before re-taking the exam.

A certificate of completion will be awarded for completion of the program with a minimum 70% grade.

Grades will be calculated based on a total of 600 possible points, meaning that a student must earn at least 420 points to successfully complete the course. However, please note above that students must score a 70% on each test in order to pass that component of the course. Unit tests are worth 25 points each, so 17.5 out of 25 must be scored in order to pass a unit test. Weighting of course assignments and tests is as follows:

Discussion board assignments (3) - 25 points each (75 points total)

Drawing assignments (3) – 25 points each (75 points total)

Business math assignment (1) – 50 points

Unit tests (8) - 25 points each (200 points total)

Final project (1) – 100 points

Final exam (1) - 100 points

Required Textbooks

PHCC Educational Foundation Plumbing Apprentice & Journeyman Training Committee (2009). *Plumbing 401*, 3rd ed. Clifton Park, NY: Delmar, Cengage Learning.

Assignments

In order to stay on track for course completion within 12 months, students are expected to complete one unit per month.

Unit 1 - Service and Repair

Read Chapters 1-6 in the *Plumbing 401* textbook.

Video - [Excavation Safety](#)

Discussion Board Assignment #1: Discuss in detail an instance when you have had to explain to a customer the need to replace a plumbing appliance or fixture versus repairing it. What was the situation? What was your rationale for replacement versus repair? How did you approach this with the customer? What was the customer's response? Would you do things differently the next time? If you have not had this experience, talk with a journeyman plumber who has had this experience and relate his or her story.

Test #1: Once you have studied the content of Chapters 1 through 6 and are prepared to take a test, you may take the Unit 1 Test by clicking on the link at the bottom of this page. Once you start the test, you may not leave it and come back later. You must complete it at that time. Make sure you have enough time to finish the test before starting it! Please note that all of the tests in this course are **closed-book tests**. As with any academic program, it is expected that you will complete each test without any outside assistance. You are on the honor system.

Unit 2 - Service and Repair

Read Chapters 7-10 in the *Plumbing 401* textbook.

Test #2: Once you have studied the content for this unit and are prepared to take a test, you may take the Unit 2 Test by clicking on the link at the bottom of this page. Again, this is a closed-book test and you may not receive any outside assistance to complete it.

Unit 3 - Blueprint Reading

Read Chapters 11-14 in the *Plumbing 401* textbook

Video - [Isometric Drawing](#)

Drawing Assignment #1: Using the partial plan view of an office building file at the bottom of this page, draw an isometric view of the project. Isometric graph paper is available at the link at the bottom of this page. Scan your drawing and write to a pdf format. Submit your assignment to the instructor at vasquez@naphcc.org.

Test #3: Once you have mastered the content of this unit and are prepared to take a test, click on the link below to take the Unit 3 Test. This is a closed-book test!

Unit 4 - Installation Practices

Read Chapters 15-17 in the *Plumbing 401* textbook.

Video - [Cross-Connection Control](#)

Test #4: Once you are prepared for the test on this unit, click on the Unit 4 Test link at the bottom of this page. No outside assistance!

Unit 5 - Heating Systems

Read Chapters 18-24 in the *Plumbing 401* textbook.

Video - [Steam Systems](#)

Video - [Hydronic Heating](#)

Discussion Board Assignment #2: Visit the U. S. Green Building Council (<http://www.usgbc.org>), EPA WaterSense (<http://www.epa.gov/watersense/>), or another green construction-oriented web site. Search for articles on green practices and/or success stories related to plumbing or heating systems (water- or air-based). Find an article and enter its link onto your entry on the discussion board. Summarize the key points of this article. Add your personal thoughts about the issues discussed in this article. Is this a practical solution? Where would it work? What obstacles exist that might prevent this from becoming a mainstream practice? You must find a unique article that no other students have posted on the discussion board to receive credit.

Drawing Assignment #2: Using the drawing provided at the link below for this assignment, draw the same system with a straight edge, adding three (3) additional radiators on a second floor above the system shown. Show piping details and add any necessary devices. Scan your drawing and write to a pdf document. Submit your assignment to the instructor at vasquez@naphcc.org.

Test #5: Click the link at the bottom of this page to take the Unit 5 Test. Again, this is a closed-book test.

Unit 6 - Related Science

Read Chapters 25-27 in the *Plumbing 401* textbook.

Video - [Pump Curves](#)

Test #6: Once you have mastered the content of this unit and are prepared to take a test, click the Unit 6 Test link at the bottom of this page. This is a closed-book test!

Unit 7 - Blueprint Reading

Read Chapters 28-31 in the *Plumbing 401* textbook.

Drawing Assignment #3: During a visit to a job, the customer showed you a duplex dwelling where he wants to install two new 40-gallon gas-fired water heaters with new ball valves, T&P valves, and new vent pipe to the brick chimney. He needs a written, firm bid to present to the bank for a loan.

Using the plumbing estimate and plumbing proposal sheets linked at the bottom of this page, detail the water heater specifications (invent a model #), describe the procedure you will use, and detail the labor hours, using the format \$000.00 for your pricing. Complete this in a way that if you needed to take this to collection for your money, it would stand up legally.

You will be graded on the completeness of the assignment including what you will and will not do, but not on the legal aspect of your presentation. Please print clearly. Scan your documents to pdf and submit your assignment to the instructor at vasquez@naphcc.org.

Test #7: When you are prepared to take the Unit 7 Test, click on the link at the bottom of this page. As always, this is a closed-book test.

Unit 8 - Plumbing Code

Read Chapters 32-42 in the *Plumbing 401* textbook. Use the *2006 National Standard Plumbing Code - Illustrated* and your local code as references throughout these chapters.

Discussion Board Assignment #3: Select one of the topics from the bulleted list below. Specify the name and version (year) of the code you are using and identify the section where the topic is addressed. List the code requirements for your selected topic. Note how this is different from the information listed in the textbook, if applicable.

- Allowable water distribution piping materials
- Prohibited joints and connections in DWV piping
- Requirements for and locations of cleanouts
- Required clearances for water closets
- Fixture requirements for dishwashers
- Allowable support intervals for copper tubing and ABS pipe
- Minimum requirements for water distribution systems
- Venting requirements for roof terminals
- Allowable plumbing system tests

Test #8: Click the link below to complete the Unit 8 Test.

Business Math

Scroll to the bottom of this page for the Plumbing 401 Math site link from Cengage Learning. Click to launch the program. Follow the Plumbing 401 Math System Tutorial (attached at top of this page) to learn how to log in to the system and navigate the topics you need to cover. You must log in and enter the Learning Code LCKFXXG837 to enter the course site for Plumbing 401 the first time you log in. You are responsible for reviewing and mastering all of the content in the following math subject areas:

Wages

Averages, Estimates & Pricing Charts

When you have reviewed these items, please **complete the Basic Business Math Test** (listed under the Tests heading on the external course site). This is worth 50 points. You have up to three attempts to get the best grade possible on this assignment.

Final Project

Using the floor plan for Repairs, Inc. included with your course materials (and also linked on this page), complete the required drawings and material take-off as directed in the Final Project Instructions (linked below). Be sure to open all of the Final Project documents and complete them as directed in the instructions. When completed, scan your drawings and documents to pdf format and submit your assignment to the instructor at vasquez@naphcc.org.

Final Exam

Review all of the previous units and tests. When you are prepared, click the link below to take the final exam.