

**PHCC Educational Foundation**  
**E-Learning**  
**Plumbing 101 Syllabus**

**Primary Course Contact**

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**Prerequisites**

None

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 provide a practical introduction to the plumbing trade
- To familiarize entry-level students with a broad overview of fundamental topics in the plumbing industry
- To provide students with an understanding of basic mathematical concepts necessary for plumbing work
- To provide students with an introduction to drawing and sketching techniques

**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
- One drawing assignment
- One math pre-test
- Nine unit tests
- One final exam

Online tests may 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](mailto: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](mailto: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 500 possible points, meaning that a student must earn at least 350 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 assignment (1) - 50 points

Math pre-test (1) – 50 points

Unit tests (9) - 25 points each (225 points total)

Final exam (1) - 100 points

## **Required Textbooks**

PHCC Educational Foundation Plumbing Apprentice & Journeyman Training Committee (2012). *Plumbing 101*, 6th ed. Clifton Park, NY: Delmar, Cengage Learning.

American College of Emergency Physicians (2014). *First Aid Manual*, 5th ed. New York, NY: DK Publishing, Inc.

## **Assignments**

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

### **Unit 1 - Plumbing Essentials and Tools**

Read Chapters 1 and 2 in the *Plumbing 101* textbook.

Video - [History of Plumbing](#) (Modern Marvels)

Video - [Careers in Plumbing](#)

Video - [Soft Skills Part 1](#)

Video - [Soft Skills Part 2](#)

Article - [5 Minutes Early is On Time](#)

Discussion Board Assignment #1: Visit your local or state licensing board web site to find regulations pertinent to the plumbing trade in your area. Note what is required for a plumber to practice his/her trade and what is required for a contractor to run a business. Go to the Discussion Board and enter the information requested in Assignment #1 (specific instructions are on the Discussion Board page).

Test #1: Once you have studied the content of Chapters 1 and 2 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 each test in this course is a **closed-book test**. As with any academic program, it is expected that you will complete each test without any outside assistance. You are on the honor system. It is our practice to check answers against the book and to mark answers as incorrect when we have reason to believe you are not following the honor system.

### **Unit 2 - First Aid & Safety**

Read Chapter 3 in the *Plumbing 101* textbook and Chapters 1-7 and 9-13 in the *First Aid Manual (4th edition)* or Chapters 1-12 in the *First Aid Manual (5th edition)*. It is recommended that you attend a Red Cross first aid course in your area to ensure that you have hands-on experience with first aid.

Video - [Are You Bringing Home More than the Bacon?](#)

Test #2: Once you have studied the content for this unit and are prepared to take a test, you may take Unit Test 2 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 - Basic Math for Plumbing**

Read Chapter 4 in the *Plumbing 101* textbook. Complete the answers to the problems in the textbook. An answer key is provided in Appendix C of the textbook.

Scroll to the bottom of this page for the Plumbing 101 Math site link from Cengage Learning. Click to launch the program. Follow the Plumbing 101 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 LCAXL7HV3C to enter the course site for Plumbing

101 the first time you log in. You are responsible for reviewing and mastering all of the content in the following math subject areas for this unit:

Basic Operations

Fractions

Decimals

Measurement

Converting Measures

Operating with Measures

Geometry (Circles, Triangles, Pythagorean Theorem, Quadrilaterals)

When you have reviewed these items, you may complete the Unit 3 Review to prepare for the Unit 3 test (listed under the Tests heading on the external course site).

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 Unit Test 3. This is a closed-book test!

#### **Unit 4 - Plumbing & Construction Basics**

Read Chapters 5-6 in the *Plumbing 101* textbook.

Video - [What is Backflow?](#)

Video - [Drinking Water Treatment Plant](#)

Video - [Wastewater Treatment Plant](#)

Discussion Board Assignment #2: Each year, public water utilities are required to submit water quality reports to the EPA. Visit the web site for the nearest public water utility in your area. What contaminants were found in the water in your area? At what levels? Are these levels considered violations of EPA requirements? What were the sources of these contaminants? Visit the Discussion Board page to enter this information.

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 - Piping Materials & Joining Methods**

Read Chapters 7-8 in the *Plumbing 101* textbook. Ask your supervisor to give you opportunities to practice properly joining the various types of piping in the field. Have your supervisor check your work and make recommendations for improvement where needed.

Video - [Soldering No-Lead Copper Alloys](#)

Video - [Solderless Fittings](#)

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

### **Unit 6 - Squares, Square Roots & Basic Geometry**

Read Chapter 9 in the *Plumbing 101* textbook. Complete the answers to the problems in the textbook. An answer key is provided in Appendix C of the textbook.

Return to the Plumbing 101 Math site link from Cengage Learning (link at the bottom of this page). Follow the Plumbing 101 Math System Tutorial (attached at top of this page) to log into the system and navigate the topics you need to cover. You are responsible for reviewing and mastering all of the content in the following math subject areas for this unit:

Number Sense (Roots)

Geometry (Angles, Triangles, Pythagorean Theorem, Circles, Degrees, Minutes & Seconds)

A Unit 6 Review is available to help you prepare for the Unit 6 test. It is optional. However, the assignment below is **REQUIRED**.

When you have reviewed these items, please **complete the Plumbing 101 Math Review** (listed under the Tests heading on the external course site). This review includes all math for the course (Units 3 and 6) and is worth 50 points. You have up to three attempts to get the best grade possible on this assignment.

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 - Fixtures, Faucets & Valves**

Read Chapters 10-12 in the *Plumbing 101* textbook.

Discussion Board Assignment #3: Select a fixture, faucet, or valve that you are using on the job and visit the manufacturer's web site to obtain a specification sheet for that item. What is contained on the specification sheet? See the Discussion Board page for more directions on completing this assignment. The External Links page includes links to many manufacturers of these products.

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 - Water Heaters**

Read Chapter 13 in the *Plumbing 101* textbook.

Video - [Water Heater Manufacturing](#)

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

### **Unit 9 - Fundamentals of Plumbing Drawings**

Read Chapters 14-15 in the *Plumbing 101* textbook.

Drawing Assignment #1: Complete Problem 2 found on page 320 of the textbook. Read the paragraph below the problem as well for additional instructions. Use the graph paper provided in the textbook (page 321-324) to make your drawings. Scan the completed drawings to .pdf or .jpg format and email them to the instructor at [vasquez@naphcc.org](mailto:vasquez@naphcc.org). There are a total of four drawings using Figures 15-12 through 15-15.

Test #9: Click the link below to complete the Unit 9 Test.

### **Final Exam**

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