



## PHCC Academy® Plumbing 101 6<sup>th</sup> Edition Syllabus

### Course Contact for Registration and Non-LMS Questions

State Chapter Partner

Refer to <https://www.phccfoundation.org/foundation/phcc-academy-partners/>

### Course Contact for Technical Problems in Absorb LMS

PHCC Academy® Staff

[AcademySupport@naphcc.org](mailto:AcademySupport@naphcc.org)

### Prerequisites

None

Welcome to the PHCC Academy® Online Apprenticeship-Related Technical Instruction program for Plumbing 101!

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 interpreting basic construction drawings

### Required Textbook (Purchased Separately)

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

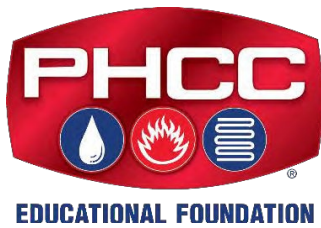
### Assignments

In each module you will be required to do the following:

- Read Chapter
- Review PowerPoint
- Watch Lesson
- Take Exam

**The Modules are titled as follows:**

- Module 1 - Plumbing History, Codes, and Principals
- Module 2 - Tools of the Plumbing Trade
- Module 3 - First Aid and Safety
- Module 4 - Basic Math for Plumbing
- Module 5 - Water Supply, Water Sources, Waste Disposal, and Sewage Disposal
- Module 6 - Mechanical Properties and Protection of Building Materials and Structures
- Module 7 - Piping Materials Used in Plumbing Work
- Module 8 - Joining Methods for DWV and Pressure Piping
- Module 9 - Squares, Square Roots, and Basic Geometry
- Module 10 - Plumbing Fixtures
- Module 11 - Faucets and Related Devices
- Module 12 - Valves
- Module 13 - Water Heaters
- Module 14 - Building Plans, Drawings, and Scale Rulers
- Module 15 - Sketching
- Comprehensive Final Exam



## PHCC Academy® Plumbing 201 Syllabus



Contacts for Registration and Non-LMS Questions - See the State Chapter Partner List:

<https://www.phccweb.org/foundation/phcc-academy-partners/>

If your state is not listed – PHCC Academy staff – [AcademySupport@naphcc.org](mailto:AcademySupport@naphcc.org)

### Course Contact for Technical Problems in Absorb LMS

PHCC Academy Staff

[AcademySupport@naphcc.org](mailto:AcademySupport@naphcc.org)

### Prerequisites

Plumbing 101 or equivalent

Welcome to the PHCC Academy™ 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 water distribution systems
- To familiarize students with sizing of water distribution and DWV systems
- To provide students with an understanding of mathematical concepts necessary for plumbing work
- To provide students with an understanding of interpreting trade drawings and sketches
- To introduce students to venting systems
- To introduce students to safety concepts for typical plumbing work

### Student Responsibilities

- Complete work in a timely manner.
- Read all information and assignments within the learning management system before starting the course.
- Complete all tests in this course as closed-book. Students are on the honor system.
- Complete all assignments with a passing grade of 70 percent or higher.
- Complete the course in 1 year (12 months) or request a 6-month extension before the course expiration date.
- Maintain records of on-the-job training completed.

### Employer Responsibilities

- Ensure that all students enrolled are proficient in reading and writing in English at a high school level and possess the self-motivation to complete internet-based coursework.
- Register apprentices with the U.S. Department of Labor, either through your own apprenticeship program or through your PHCC State Chapter Partner's registered apprenticeship program.

- Track the apprentice's on-the-job training hours and document such hours. Documentation records must be maintained by the employer for the duration of the apprentice's employment and must be retained as required by the U.S. Department of Labor.
- Ensure that apprentices are paid a progressively increasing schedule of wages and fringe benefits based on a percentage of the current journey worker wage rate as specified in the Standards of Apprenticeship for the program under which the apprentice is participating.

#### **State Chapter Partner Responsibilities**

- Register and enroll students in the appropriate courses on the learning management system.
- Assist students with ordering textbooks for their courses.
- Act as the primary point of contact for students and employers who register for courses in their state.
- Serve as the liaison between the PHCC Academy and employers of apprentices enrolled in the program in their state.

#### **PHCC Academy Responsibilities**

- Ensure that the federal Department of Labor approval for the apprenticeship program is kept current and is updated as needed.
- Administer the learning management system and course offerings for the eLearning program. This includes developing course content and placing it into the learning management system.
- Provide students with learning management system usernames and passwords.
- Provide all administrative functions on the learning management system.
- Coordinate any Advanced Placement Testing with PHCC State Chapter Partners.
- Provide a completion letter and certificate to students upon successful completion of each course.

#### **Required Textbooks (Purchased Separately)**

PHCC Educational Foundation Plumbing Apprentice & Journeyman Training Committee (2015). *Plumbing 201*, 6th ed. Clifton Park, NY: Delmar, Cengage Learning.

#### **Assignments**

##### Unit 1 – Installation Practices

Read Chapter 1 in the Plumbing 201 textbook.

Video – Customer Service Leadership

Video – Customer Service Persuasion

Chapter 1 Review PowerPoint

Read Chapter 2 in the Plumbing 201 textbook

Video – Solvent Cement Joining PVC

Video – Flaring Copper Tube

Video – Cutting Cast Iron Soil Pipe with Snap Cutters

Video – Joining PEX Pipe

Video – Using SharkBite Push Fittings

Chapter 2 Review PowerPoint

Read Chapter 3 in the Plumbing 201 textbook.

Chapter 3 Review PowerPoint

Video – Radiant Floor Heating Types

Unit 1 Exam

## Unit 2 – Joining Methods

Read Chapter 4 in the Plumbing 201 textbook.

Video – Welding PPE

Chapter 4 Review PowerPoint

Read Chapter 5 in the Plumbing 201 textbook.

Video – Soldering Copper Tube

Video – Brazing Copper Tube

Chapter 5 Review PowerPoint

Unit 2 Exam

## Unit 3 – Installation Practices – Water Supply

Read Chapter 6 in the Plumbing 201 textbook.

Video – Public Water Distribution System

Video – Private Water Distribution System

Chapter 6 Review PowerPoint

Read Chapter 7 in the Plumbing 201 textbook.

Chapter 7 Review PowerPoint

Read Chapter 8 in the Plumbing 201 textbook.

Video – Gas Water Heater Troubleshooting

Chapter 8 Review PowerPoint

Unit 3 Exam

## Unit 4 – Installation Practices - DWV

Read Chapter 9 in the Plumbing 201 textbook.

Video – Backflow and Cross Connection Control: Applications and Installations

Chapter 9 Review PowerPoint

Read Chapter 10 in the Plumbing 201 textbook.

Chapter 10 Review PowerPoint

Read Chapter 11 in the Plumbing 201 textbook.

Chapter 11 Review PowerPoint

Read Chapter 12 in the Plumbing 201 textbook.

Video – Hydraulic Jump

Chapter 12 Review PowerPoint

Video – Wastewater Treatment Plant

Read Chapter 13 in the Plumbing 201 textbook.

Chapter 13 Review PowerPoint

DWV Systems Game

Unit 4 Exam

## Unit 5 – Plumbing Mathematics

Read Chapter 14 in the Plumbing 201 textbook.

Video – Adding and Subtracting Fractions Review

Video – Multiplying Fractions Review

Video – Dividing Fractions Review

Video – Mixed Numbers Review

Video – Converting Fractions to Decimals

Video – Exponents and Roots

Chapter 14 Review PowerPoint  
Read Chapter 15 in the Plumbing 201 textbook.  
Chapter 15 Review PowerPoint  
Video – Circles: Circumference and Area  
Video – Perimeter  
Video – Area  
Video – Volume  
Unit 5 Exam  
Quiz – Fractions and Exponents/Roots Quiz

Unit 6 – Related Science and Venting  
Read Chapter 16 in the Plumbing 201 textbook.  
Chapter 16 Review PowerPoint  
Read Chapter 17 in the Plumbing 201 textbooks.  
Chapter 17 Review PowerPoint  
Video – Plumbing Vent System Walk-Thru  
Unit 6 Exam

Unit 7 – Installation Practices  
Read Chapter 18 in the Plumbing 201 textbook.  
Video – How It's Made Sewage Pumps  
Chapter 18 Review PowerPoint  
Read Chapter 19 in the Plumbing 201 textbook.  
Video – How a Plumbing Trap Can Lose Water  
Chapter 19 Review PowerPoint  
Read Chapter 20 in the Plumbing 201 textbook.  
Chapter 20 Review PowerPoint  
Unit 7 Exam

Unit 8 – Safety Practices  
Read Chapter 21 in the Plumbing 201 textbook.  
Chapter 21 Review PowerPoint  
Read Chapter 22 in the Plumbing 201 textbook.  
Chapter 22 Review PowerPoint  
Video – Ladder Safety  
Safety Review Game  
Unit 8 Exam

Unit 9 – Blueprint Reading and Construction Drawings  
Read Chapter 23 in the Plumbing 201 textbook.  
Chapter 23 Review PowerPoint  
Read Chapter 24 in the Plumbing 201 textbook.  
Chapter 24 Review PowerPoint  
Unit 9 Exam

Final Exam

Course Evaluation



## PHCC Academy® Plumbing 301 Syllabus



Contacts for Registration and Non-LMS Questions - See the State Chapter Partner List:

<https://www.phccweb.org/foundation/phcc-academy-partners/>

If your state is not listed – PHCC Academy staff – [AcademySupport@naphcc.org](mailto:AcademySupport@naphcc.org)

### Course Contact for Technical Problems in Absorb LMS

PHCC Academy Staff

[AcademySupport@naphcc.org](mailto:AcademySupport@naphcc.org)

### Prerequisites

Plumbing 101 and 201 or equivalent

Welcome to the PHCC Academy™ 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 fixtures and appliances
- To familiarize students installation methods for fixtures and appliances
- To provide students with an understanding of blueprints, drawing types, and plumbing plans
- To introduce students to fuel gas piping systems and appliances
- To introduce students to advanced mathematical concepts used in plumbing work
- To provide students with an understanding of electrical concepts related to plumbing work

### Student Responsibilities

- Complete work in a timely manner.
- Read all information and assignments within the learning management system before starting the course.
- Complete all tests in this course as closed-book. Students are on the honor system.
- Complete all assignments with a passing grade of 70 percent or higher.
- Complete the course in 1 year (12 months) or request a 6-month extension before the course expiration date.
- Maintain records of on-the-job training completed.

### Employer Responsibilities

- Ensure that all students enrolled are proficient in reading and writing in English at a high school level and possess the self-motivation to complete internet-based coursework.
- Register apprentices with the U.S. Department of Labor, either through your own apprenticeship program or through your PHCC State Chapter Partner's registered apprenticeship program.

- Track the apprentice's on-the-job training hours and document such hours. Documentation records must be maintained by the employer for the duration of the apprentice's employment and must be retained as required by the U.S. Department of Labor.
- Ensure that apprentices are paid a progressively increasing schedule of wages and fringe benefits based on a percentage of the current journey worker wage rate as specified in the Standards of Apprenticeship for the program under which the apprentice is participating.

### **State Chapter Partner Responsibilities**

- Register and enroll students in the appropriate courses on the learning management system.
- Assist students with ordering textbooks for their courses.
- Act as the primary point of contact for students and employers who register for courses in their state.
- Serve as the liaison between the PHCC Academy and employers of apprentices enrolled in the program in their state.

### **PHCC Academy Responsibilities**

- Ensure that the federal Department of Labor approval for the apprenticeship program is kept current and is updated as needed.
- Administer the learning management system and course offerings for the eLearning program. This includes developing course content and placing it into the learning management system.
- Provide students with learning management system usernames and passwords.
- Provide all administrative functions on the learning management system.
- Coordinate any Advanced Placement Testing with PHCC State Chapter Partners.
- Provide a completion letter and certificate to students upon successful completion of each course.

### **Required Textbook (Purchased Separately)**

PHCC Educational Foundation Plumbing Apprentice & Journeyman Training Committee (2017). *Plumbing 301*, 2nd ed. Clifton Park, NY: Delmar, Cengage Learning.

### **Assignments**

#### Unit 1 – Installation Practices

Read Chapter 1 in the Plumbing 301 textbook.

Video – The Life of Pipe: Planning, Prefabrication, Installation and Delivery

Chapter 1 Review PowerPoint

Read Chapter 2 in the Plumbing 301 textbook

Chapter 2 Review PowerPoint

Read Chapter 3 in the Plumbing 301 textbook.

Video – How to Install a New Garbage Disposer

Chapter 3 Review PowerPoint

Read Chapter 4 in the Plumbing 301 textbook.

Chapter 4 Review PowerPoint

Read Chapter 5 in the Plumbing 301 textbook.

Chapter 5 Review PowerPoint

Read Chapter 6 in the Plumbing 301 textbook.

Chapter 6 Review PowerPoint

Unit 1 Exam



### Unit 2 – Blueprint Reading

Read Chapter 7 in the Plumbing 301 textbook.

Chapter 7 Review PowerPoint

Read Chapter 8 in the Plumbing 301 textbook.

Video – How to Read Floor Plans

Chapter 8 Review PowerPoint

Read Chapter 9 in the Plumbing 301 textbook.

Chapter 9 Review PowerPoint

Quiz – Drawing Assignment

Unit 2 Exam

### Unit 3 – National Fuel Gas Code, Piping, Connections, and Controls

Read Chapter 10 in the Plumbing 301 textbook.

Read Chapter 11 in the Plumbing 301 textbook.

Read Chapter 12 in the Plumbing 301 textbook.

Chapter 10 Review PowerPoint

Chapter 11 Review PowerPoint

Chapter 12 Review PowerPoint

Unit 3 Exam

### Unit 4 – Combustion Air, Venting, and Fundamentals of LP

Read Chapter 13 in the Plumbing 301 textbook.

Chapter 13 Review PowerPoint

Read Chapter 14 in the Plumbing 301 textbook.

Video – Fuel Gas Purging

Chapter 14 Review PowerPoint

Venting and Fuel Gas Terms Review Game

Unit 4 Exam

### Unit 5 – Elevations, Grade, and Trench Safety

Read Chapter 15 in the Plumbing 301 textbook.

Chapter 15 Review PowerPoint

Read Chapter 16 in the Plumbing 301 textbook.

Video – How to Set Up a Builder's Level

Chapter 16 Review PowerPoint

Unit 5 Exam

### Unit 6 – Applied Math – Offsets, Ratios, and Tank Capacities

Read Chapter 17 in the Plumbing 301 textbook.

Video – Parallel Offsets

Video - 45° Parallel Offsets with Constants

Video – Rolling Offsets

Chapter 17 Review PowerPoint

Quiz – Offsets and Ratios

Read Chapter 18 in the Plumbing 301 textbook.

Chapter 18 Review PowerPoint

Video – Calculating Tank Volume

Quiz – Tank Capacities, Volume, and Weight of Water  
Unit 6 Exam

Unit 7 – Installation Practices

Read Chapter 19 in the Plumbing 301 textbook.  
Chapter 19 Review PowerPoint  
Read Chapter 20 in the Plumbing 301 textbook.  
Chapter 20 Review PowerPoint  
Read Chapter 21 in the Plumbing 301 textbook.  
Chapter 21 Review PowerPoint  
Read Chapter 24 in the Plumbing 301 textbook.  
Chapter 24 Review PowerPoint  
Unit 7 Exam

Unit 8 – Related Science

Read Chapter 22 in the Plumbing 301 textbook.  
Video – Psychrometric Charts  
Video – Calculating Relative Humidity and Dew Point  
Chapter 22 Review PowerPoint  
Read Chapter 23 in the Plumbing 301 textbook.  
Chapter 23 Review PowerPoint  
Related Science and Water Treatment Terms Review Game  
Unit 8 Exam

Unit 9 – Blueprint Reading and Construction Drawings

Read Chapter 25 in the Plumbing 301 textbook.  
Chapter 25 Review PowerPoint  
Read Chapter 26 in the Plumbing 301 textbook.  
Video – Electrical Safety  
Chapter 26 Review PowerPoint  
Read Chapter 27 in the Plumbing 301 textbook.  
Video – Basic Electrical Measurements  
Video – Electrical Troubleshooting  
Chapter 27 Review PowerPoint  
Unit 9 Exam

Final Exam

Course Evaluation



## PHCC Academy® Plumbing 401 2<sup>nd</sup> Edition Syllabus

### Course Contact for Registration and Non-LMS Questions

State Chapter Partner

Refer to <https://www.phccfoundation.org/foundation/phcc-academy-partners/>

### Course Contact for Technical Problems in Absorb LMS

PHCC Academy® Staff

[AcademySupport@naphcc.org](mailto:AcademySupport@naphcc.org)

### Prerequisites

Plumbing 101, 201 and 301 or equivalent

Welcome to the PHCC Academy® Online Apprenticeship-Related Technical Instruction program for Plumbing 401!

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

### Required Textbook (Purchased Separately)

PHCC Educational Foundation Plumbing Apprentice & Journeyman Training Committee (2020). *Plumbing 401*, 2nd ed. Boston, MA: Cengage Learning

### Assignments

In each module you will be required to do the following:

- Read Chapter
- Review PowerPoint
- Watch Lesson
- Take Exam

**The Modules are titled as follows:**

- Module 1: Service and Repair: Fixtures
- Module 2: Service and Repair: Water and Fuel Gas Distribution
- Module 3: Service and Repair: DWV Systems
- Module 4: Sizing DWV and Storm Drainage Systems
- Module 5: Sizing Water Distribution and Fuel Gas Piping Systems
- Module 6: Indirect and Special Wastes
- Module 7: Protection of the Water Supply
- Module 8: Steam Heating
- Module 9: Hydronic Heating and Controls
- Module 10: Forced Air Heating and Alternative Heating Systems
- Module 11: Pumps
- Module 12: Blueprints, Isometrics, and Material Take-Offs
- Module 13: Plumbing Code Administration and Licensing
- Module 14: Plumbing Fixtures and Minimum Fixture Requirements
- Module 15: Plumbing Codes: Water Heaters
- Module 16: Water Supply and Distribution
- Module 17: Plumbing Codes: Sanitary Drainage
- Module 18: Plumbing Codes: Indirect Wastes
- Module 19: Plumbing Codes: Vents
- Module 20: Plumbing Codes: Traps and Interceptors
- Module 21: Plumbing Codes: Storm Drainage
- Module 22: Plumbing Codes: Fuel Gas Piping
- Module 23: Plumbing Codes: Healthcare Facilities, Medical Gas, and Vacuum Systems
- Module 24: Plumbing Codes: Non-potable Water Systems
- Comprehensive Final Exam