

Burlington County Institute of Technology

_____ **Medford Campus** **Westampton Campus**

CAREER MAJOR PROGRAMS

Course Title: Plumbing Technology

Curriculum Area: CTE

Credits: 5

Board Approved: May, 2018

Prepared by: Wayne Shelton

Plumbing Curriculum

I. Course of Study (Proposed):

A. Introduction to Plumbing	(9th)	S1 B4
B. Plumbing Safety Terminology and Tools	(9th)	S2 B4
C. Plastic, Cast Iron, Copper Pipes and Fittings Theory	(10th)	S1 B1
D. Plastic, Cast Iron, Copper & Fittings Lab	(10th)	S1 B2
E. Advanced Piping, Water Supply Distribution	(10th)	S2 B1
F. Applied Plumbing Math and Science Theory	(11th)	S1 B1
G. Plumbing Fixtures, and Fittings	(11th)	S2 B1
H. Blueprints and Plumbing Isometrics	(11th)	S2 B2
I. Business Law for Plumbers	(12th)	S1 B3
J. Business Applications (marketing)	(12th)	S2 B3
K. Contracts and Legal Issues	(12th)	S1 B4
L. Troubleshooting/Maintenance/Repairs	(12th)	S2 B4

II. Program Descriptor:

The Plumbing program is a four year course that will provide students with theory and knowledge from basic practices and applications to a more advanced level of design code compliance and evaluation of installation practices. Modules of information, trade terms and methods of design, application and installation will be reviewed discussed and exercised in a shop setting lab and the use of live equipment tools, parts, fittings and fixtures will be installed and serviced. Plumbing Sciences and mathematics will be integrated into each module of learning where applicable, as well as business law and marketing and contracting terminology and common practices.

III. Program Outcome.

Students completing the four year course will have prepared themselves for entry level employment with Master Plumbers and companies in the plumbing and mechanical fields of employment as advanced helpers and enter apprenticeship opportunities for further growth within the business with time accreditation of hours for 1st year apprentice related instruction with US Dept. of Labor standards of apprenticeship. Others will be prepared to test into Union type apprenticeship programs as well as Nonunion open shop opportunities.

IV. Course Descriptions:

A. Exploratory/Introduction to Plumbing (9th)

This course will familiarize the student with history of plumbing, Purpose of sanitary plumbing, career opportunities options, Current technology of the industry and many associations that make up the plumbing profession. Human relations as well as safety skills and soft skills will be reviewed.

B. Plumbing Safety Terminology and Tools (9th)

This course will discuss causes of accidents and the consequences and repercussions, increased expenses, injuries, loss of life. The review of proper use of PPE equipment. The students will learn critical safety signs and information conveyed in written hazardous information and communications. (HazCom) Safety signs, signals, lockout/tag out, emergency responses, the review of all safeties within the use of related tools.

C. Plumbing Plastic Pipes and Fitting Theory (10th/11th)

Introduces trainees to the different types of plastic piping used in plumbing applications, ABS, PVC, CPVC, PE, PEX, etc. Describes how to measure, cut, fit, join, and support plastics according to the manufacturer's instructions and related code section of National Standard Plumbing Code Current Model Year. Also discusses related pressure testing methods and test out procedures after application and installation.

D. DWV Plastic /Cast Iron/ Copper Fittings Lab (10th/11th)

Discusses sizing and application practices. Students will install piping and valves related to copper and or plastics and review the various applications DWV and water supply for each type. In place cutting, joining and installation to manufacturer's specification as well as code related sections. Insulation requirements pressure testing methods, seismic concerns, handling and storage of piping with inventory requirements.

E. Advanced Piping/ Water Supply and Distribution (10th/11th)

Identifies major components of the water supply system and terms as well as function and purpose of each component Reviews water sources, and treatment methods, covers each type of supply and distribution of different types of piping and code relationship, sizing, charts, wsfu, gpm, and interpolation of code sense that students may use on the job.

The Carbon Steel section discusses threading, tools , machinery use, the proper techniques of cutting threading supporting steel and stainless steel piping system that may be used for gas, steam ,hydronic, corrugated steel applications.,

F. Plumbing Fixtures and Fitting (10th)

Discusses the proper applications of code approved fixtures in plumbing installations. Reviews the different types of fixtures and related components of each material used with them. Covers storage handling and related code requirements, locations, water conservation, and relevant basic principles.

G. Applied Plumbing Math/Science (11th)

Explores the basic math concepts, whole numbers, fractions, squares, decimals, percentage, reading a ruler. Demonstrates how they apply to job situations with the plumbing trade. Use of tables, charts and graphs, framing squares, Offsets and piping arrangement calculations and formulas. Also explores the function of sciences as applied to waste lines Safety from diseases in improper plumbing systems, types of sickness and disease relevant to proper methods of plumbing, vents, stacks, traps and safeties built into the systems.

H. Blueprint and Plumbing Isometrics (12th)

This section introduces the students to various types of drawing they may encounter within the trade.

How to interpret and apply them when laying out work. Discusses the symbols of plumbing fittings and fixtures and mechanical systems. Review Isometric, oblique, orthographic, as well as schematic drawings. Requires students to render drawings and to recognize code relationships and interpretations.

I. Business Law for Plumbers (12th)

This section represents a new course of learning related to development of Master Plumbers and the necessity to have knowledge in and understand the makeup of business methods, responsibility to governing bodies such as IRS, sales tax, payroll Deductions, getting a paycheck, paying business taxes, Liabilities. In this course we will review and practice forms, reports and filings required by law, both personal and business related.

J. Business Applications /Marketing (optional) (12th)

This course allows students to mock up a company and develop a plan for building customers, customer's relationships, developing a marketing plan, figuring pricing with materials and labor estimates, learning to use labor calculators to make up an estimate, invoices and statements. Students will read off

blueprints and then develop a proposal for work to be done, keeping in mind the total cost, net profits, warranties, and responsibilities. Students will develop inventories and maintain report on Microsoft's Access program. Students will be able to perform a work assignment, adjust inventories, make out a daily report and invoice the customer in a simulation of business practice.

K. Contracts and Legal Issues (School to work) optional (12th)

This Course of study will allow students to simulate making out formal contracts for customers, agreements for work to be done, rights of customer's rescission, disclosures of guarantees and warranties. The students will write employment agreements for their companies and formulate growth plans for employees. Students will use excel, PowerPoint and access as methods of creating documents.

L. Troubleshooting, Maintenance, Repair. (12th)

This course of study allows the students to perform repairs to fixtures and faucets, water heaters, replacing valves, replacing stems and cartridges, replacing a tub waste, resetting sinks, water closet change outs and wax seal replacement. The course will serve to strengthen the student's performance in diagnosing troubles, and preparing for service work, also use of basic drain cleaning machinery will be performed.

Course: Exploratory/ Introduction to Plumbing

9th grade, Semester I Unit: History of Plumbing

Length: Sept-Nov

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS
Plumbing Proficiencies: 1,2,3,13,14,15,19 9.1.12 A 1-4 9.1.12 B. 1-3 9.1.12. C 1-5 9.1.12 F 1-6 9.2.12 A 1-12 9.2.12 B 1-10 9.2.12 E 1-9 9.2.12 G 1-10 9.3.12 C 1-24 9.4.12.O (2) 1-6	Do I want to be a Plumber? What are the materials used in plumbing? How do you connect various types of piping? What are the methods of joint connections? How do I grow in the business as a plumber?	Tools Safety Use of tools Small piping projects Various types of piping. Module one Nccer Level one	Describe career opportunities in plumbing field. Explain and describe different levels in career field. Explain how to advance in career field with extended education. Understand what is necessary to obtain a plumbing license.	Written/Oral Quizzes Written Chapter Tests Daily Practice Observation/Visual of Projects Evaluation/Test

Course: Introduction to Plumbing 9th grade, Semester I Unit: History of Plumbing Length: Nov Dec S1B4

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS
Plumbing Proficiencies: 1,2,3,13,14,15,19 9.2.12.C.1-3 9.3.12.AC.1 9.3.12.AC.5 9.3.12.AC-MO.1 RST.9-10.1 RST.9-10.3 CRP-1-12	Why does society need plumbers, why are codes required? What are the different levels of plumbing systems? How do we create green plumbing systems? How has plumbing changed through the years?	History of plumbing Purpose of codes . Basic principles of codes Module one level one NCCER	Determine needs for Sanitary Systems. Evaluate different levels of The plumbing Industry. State Characteristics of the profession. Identify stages of progress in the industry and its impact on society. Identify Green Technology.	Written/Oral quiz Chapter Test Daily Practices Rubrics Visual Observations Projects Evaluation /Test

Career Major: Introduction to Plumbing

Month: LEVEL 1

November- January S1B4

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
<p>Plumbing Proficiencies #1, 2, 3, 13, 14, 15, 99</p> <p>CRP 1-12 9.2.12.C.1-4 9.3.12.AC.5 9.3.12.AC.7 RST.9-10.1 RST.9-10.4 RST.9-10.5</p>	<p>How did we get to where society needs plumbers?</p> <p>Why are Plumbing codes needed and monitored?</p> <p>Where do we get clean water and where does the waste go?</p> <p>How do I become a plumber and how high can I achieve?</p> <p>What are some basic math functions for plumbers?</p>	<p>History of plumbing</p> <p>Purpose of the plumbing codes</p> <p>Basic principles of the code</p> <p>Different codes nationally and internationally</p> <p>Fundamentals of potables, DWV and Storm Systems</p> <p>Different levels and structures of being a plumber</p> <p>Module one level one Nccer</p>	<p>Describe career opportunities in plumbing field.</p> <p>Explain and describe different levels in career field.</p> <p>Explain how to advance in career field with extended education.</p> <p>Understand what is necessary to obtain a plumbing license.</p> <p>Making basic design using basic math in plumbing</p>	<p>Written/Oral Quizzes Written Chapter Tests Daily Practice Observation/Visual of Projects Evaluation/Test</p>	<p>Plumbing Design & Installation Textbook & Workbook Internet Research of Career Opportunities Notes from lectures National Standard Plumbing Code Internet Research of New Jersey license procedure Internet Research of Apprentice Standards Nccer plumbing level 1 text/workbook</p>

CAREER MAJOR COURSE: Plumbing Safety and Tools MONTH: Level 1 January -March S2B4

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
<p>Plumbing Proficiencies #4-#15, #110</p> <p>9.3.12.AC.1 9.3.12.AC.3 9.3.12.AC-CST.5 WHST.9-10.7 CRP1-12</p>	<p>Why would a person need to understand safety and use protection while performing plumbing duties?</p> <p>Is there a proper way to handle tools safely?</p> <p>Are there special precautions when using electricity?</p> <p>What do you need to account for when a job requires a ladder or something that needs scaffolding?</p> <p>Why do students need to know about motor vehicle safety?</p> <p>What is OSHA and why was it created?</p>	<p>Safety</p> <p>Personal Protection</p> <p>Hand tools</p> <p>Power tools</p> <p>Electrical</p> <p>Ladders and scaffolding</p> <p>High reach</p> <p>Motor vehicle</p> <p>Material handling</p> <p>Chemicals</p> <p>Hazardous waste and materials</p> <p>Torch</p> <p>Module Two Level one NCCER</p>	<p>Students will be able to:</p> <p>Demonstrate safety procedures in shop.</p> <p>Demonstrate safety procedures on the job.</p> <p>Demonstrate personal safety procedures.</p> <p>Understand OSHA and who it protects.</p> <p>Understand safety OSHA regulations.</p> <p>Understand the "Right to Know" laws.</p> <p>MSDS information.</p>	<p>Written/Oral Quizzes</p> <p>Written Chapter Tests</p> <p>Daily Practice</p> <p>Observation</p> <p>Evaluation/Test</p> <p>Internet Activities</p> <p>Collections of MSDS information on Chemical Safety</p>	<p>National Standard Plumbing Code American Technical Publishing Review (ATP) Software Corporate Internet Research OSHA & MSDS information Review Notes VCR Videos Nccer level 1 text/workbook Module two</p>

CAREER MAJOR COURSE: PLUMBING Safety and Tools

MONTH: Level 1 April -June S2B4

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
<p>Plumbing Proficiencies #18, #19, 105, 106</p> <p>9.3.12.AC.1 9.3.12.AC.3 9.3.12.AC-CST.5 WHST.9-10.7 CRP1-12</p>	<p>Does it matter what tools I use when working?</p> <p>Is there ever a time when hand tools are more acceptable?</p> <p>When does a plumber need to improvise or change tools?</p>	<p>Tools</p> <p>Hand tools</p> <p>Power tools</p> <p>Saws</p> <p>Drills</p> <p>Torches and tanks</p> <p>Specialty tools</p> <p>Nccer Module three Level one</p>	<p>Recognize and select correct tool for application.</p> <p>Apply correct tool to application and use it correctly.</p> <p>Switch tools for different application.</p>	<p>Written/Oral Quizzes Written Chapter Tests Daily Practice Observation Evaluation/Test Internet Activities</p>	<p>Plumbing Design & Installation Textbook & Workbook National Standard Plumbing Code American Technical Publishing Review (ATP) Software Handle use of tools on Physical Projects Tests Review Notes NCCER level one module three.</p>

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
Plumbing Proficiencies #4-#15, #110 9.3.12.AC.1 9.3.12.AC.3 9.3.12.AC-CST.5 9.3.12.AC-CST.9 9.3.12.AC-DES.4 9.3.12.AC-DES.8 9.3.12.AC-MO.1	Why would a person need to understand safety and use protection while performing plumbing duties? Is there a proper way to handle tools safely? Are there special precautions when using electricity? What do you need to account for when a job requires a ladder or something that needs scaffolding? Why do students need to know about motor vehicle safety? What is OSHA and why was it created?	Safety Personal Protection Hand tools Power tools Electrical Ladders and scaffolding High reach Motor vehicle Material handling Chemicals Hazardous waste and materials Torch Nccer safety modules	Students will be able to: Demonstrate safety procedures in shop. Demonstrate safety procedures on the job. Demonstrate personal safety procedures. Understand OSHA and who it protects. Understand safety OSHA regulations. Understand the "Right to Know" laws. MSDS information.	Written/Oral Quizzes Written Chapter Tests Daily Practice Observation Evaluation/Test Internet Activities Collections of MSDS information on Chemical Safety	National Standard Plumbing Code American Technical Publishing Review (ATP) Software Corporate Internet Research OSHA & MSDS information Review Notes VCR Videos Nccer Safety Modules.level two

CAREER MAJOR COURSE: Plastics, Cast Iron, Copper, Pipes and Fitting Theory MONTH: Level 2 October-Dec. S1 B1

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
<p>Plumbing Proficiencies #75-#79</p> <p>9.3.12.AC.2 9.3.12.AC.6 9.3.12.AC-CST.3 9.3.12.AC-CST.7 9.3.12.AC-DES.1 RST.9-10.1 RST.9-10.3</p>	<p>How am I going to hold the piping systems together?</p> <p>How might we prove/confirm /justify that the pipe is full or empty?</p> <p>What might happen when a plumber changes anchors when securing different materials?</p> <p>What does the Code reveal about the use of anchors?</p>	<p>HANGERS/SUPPORT S LINE INSTALLER</p> <p>Plastics Module Six</p> <p>Nccer Theory</p> <p>Identify and select proper hangers/ supports according to code and standard practice</p> <p>Understand the use of hangers and why able to select proper anchors according to building construction materials</p> <p>Install hangers with proper grade</p> <p>Nccer Module 6,</p> <p>Nccer Level one Plastic pipe /fittings Fitting selection/use</p>	<p>Install hangers and support.</p> <p>Know proper techniques according to text and code</p> <p>Determine types of plastics.</p> <p>Support properly.</p> <p>Tie in Code compliance.</p>	<p>Written/Oral Quizzes Written Chapter Tests Daily Practice Observation Evaluation/Test Internet Activities</p>	<p>Plumbing Design & Installation Textbook & Workbook National Standard Plumbing Code American Technical Publishing Review (ATP) Software Handle use of tools on Physical Projects Tests Review Notes</p>

CAREER MAJOR COURSE:

Plastics, Cast Iron, Copper, Pipes and Fitting Theory

MONTH: Level 2 Jan-March S1 B1

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
<p>Plumbing Proficiencies #75-#79</p> <p>9.3.12.AC-DES.3 9.3.12.AC-DES.4 9.3.12.AC-DES.6 RST.9-10.1 RST.9-10.3 CRP1-12</p>	<p>How am I going to hold the piping systems together?</p> <p>How might we prove/confirm/justify that the pipe is full or empty?</p> <p>What might happen when a plumber changes anchors when securing different materials?</p> <p>What does the Code reveal about the use of anchors?</p>	<p>Hangers, supports</p> <p>Pipe Installation</p> <p>Copper Tube</p> <p>Module 7 Nccer Theory</p> <p>Identify and select proper hangers/piping supports according to code and standard practice</p> <p>Understand the use of hangers and why</p> <p>Able to select proper anchors according to building construction materials used</p> <p>Install hangers with proper grade</p> <p>Nccer Module 7,</p> <p>Nccer Level one Copper pipe /fittings</p>	<p>Install hangers and support.</p> <p>Know proper Installation techniques according to text and code.</p> <p>Determine types of materials.</p> <p>Support properly.</p> <p>Tie in Code compliance.</p>	<p>Written/Oral Quizzes Written Chapter Tests Daily Practice Observation Evaluation/Test Internet Activities</p>	<p>Plumbing Design & Installation Textbook & Workbook National Standard Plumbing Code American Technical Publishing Review (ATP) Software Handle use of tools on Physical Projects Tests Review Notes</p>

CAREER MAJOR COURSE: Plastics, Cast Iron, Copper, Pipes and Fitting Theory MONTH: level 2 April -June S1 B1

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
<p>Plumbing Proficiencies #75-#79</p> <p>9.3.12.AC-DES.1 9.3.12.AC-DES.3 9.3.12.AC-DES.4 9.3.12.AC-CST.3 9.3.12.AC-CST.7 RST.9-10.6. RST.9-10.8. CRP1-12</p>	<p>How am I going to hold the piping systems together?</p> <p>How might we prove/confirm/justify that the pipe is full or empty?</p> <p>What might happen when a plumber changes anchors when securing different materials?</p> <p>What does the Code reveal about the use of anchors?</p>	<p>Hangers/support line installer</p> <p>Cast Iron pipe and fittings</p> <p>Nccer Module 8 Theory</p> <p>Identify and select proper hangers/ supports according to code and standard practice</p> <p>Understand the use of hangers and why</p> <p>Able to select proper anchors according to building construction materials</p> <p>Install hangers with proper grade</p> <p>Nccer Module 7,</p> <p>Nccer Level one Copper pipe /fittings</p>	<p>Students will be able to: Install hangers and support.</p> <p>Know proper techniques according to text and code, models</p> <p>Determine types of cast iron./methods to install</p> <p>Support properly.</p> <p>Tie in Code compliance.</p>	<p>Written/Oral Quizzes Written Chapter Tests Daily Practice Observation Evaluation/Test Internet Activities</p>	<p>Plumbing Design & Installation Textbook & Workbook National Standard Plumbing Code American Technical Publishing Review (ATP) Software Handle use of tools on Physical Projects Tests Review Notes</p>

CAREER MAJOR COURSE: Plastics, Cast Iron, Copper, Pipes and Fitting Lab MONTH: Level 2 Feb-April S2B2

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
<p>Plumbing Proficiencies #16, 40</p> <p>9.3.12.AC.1 9.3.12.AC.2 9.3.12.AC.6 9.3.12.AC-CST.2 9.3.12.AC-CST.3 CRP1-12</p>	<p>What size pipe should be run for the different water systems?</p> <p>When will I need math skills to size water pipes?</p> <p>How are residential potable water systems similar to/different from commercial systems?</p> <p>What are different types of materials or fittings that affect water flow?</p>	<p>Theory</p> <p>The use of a WSFU System</p> <p>What affects flow velocity</p> <p>Different measurements of flow rate</p> <p>Add/subtract/multiply whole numbers and decimals</p> <p>Use of sizing charts Nccer Module 12</p> <p>Intro to water systems</p> <p>Use of code charts</p> <p>Wsfu,fps velocity</p> <p>Different pipes=different capacity</p>	<p>Size a residential and commercial potable water system.</p> <p>Perform math calculations needed to perform sizing</p>	<p>Written/Oral Quizzes Written Chapter Tests Daily Practice Observation Evaluation/Test Internet Activities</p>	<p>Modern Plumbing text and workbook Plumbing Design & Installation Textbook & Workbook National Standard Plumbing Code Calculators Internet Research – Methods of Sizing Computation Charts Nccer level one Module 12</p>

CAREER MAJOR COURSE: Advanced Water Supply and Distribution

MONTH: Level 2 April-June S2 B2

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
Plumbing Proficiencies #16, 40 Reading #1 9.1.12.A 1-4 9.1.12.B.1-3 9.1.12.C.1-5 9.1.12.F.1-6 9.2.12.A.1-12 9.2.12.B.1-10 9.2.12.E.1-9 9.2.12.G.1-10 9.3.12.C.1-24 9.4.12.O.(2).1-6	What size pipe should be run for the different water systems? When will I need math skills to size water pipes? How are residential potable water systems similar to/different from commercial systems? What are different types of materials or fittings that affect water flow?	Lab/ shop The use of a WSFU System and DWV system What affects flow velocity Different measurements of flow rate Add/subtract/multiply whole numbers and decimals Use of sizing charts Nccer Module 11,12 Intro to water systems Use of code charts Wsfu,fps dfu velocity Different pipes=different capacity	Size a residential and commercial potable water system. Perform math calculations needed to perform sizing Install lines based on calculations. Calculate dwv and venting systems. Determine size of piping. Calculate drainage fixture units per code	Written/Oral Quizzes Written Chapter Tests Daily Practice Observation Evaluation/Test Internet Activities	Plumbing Design & Installation Textbook & Workbook National Standard Plumbing Code Calculators Internet Research – Methods of Sizing Computation Charts Nccer level one Module 11,12

CAREER MAJOR COURSE: Plumbing Fixtures and Fittings

MONTH: Level 3 Jan- Feb S2 B1

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
<p>Plumbing Proficiencies #42, 48, 94</p> <p>9.3.12.AC-MO.2 9.3.12.AC-MO.3 9.3.12.AC-DES.8 9.3.12.AC-DES.3 CRP1-12</p>	<p>What does science reveal about plumbing and its related fixtures?</p> <p>How and when can we use science principles with the flow of liquid?</p> <p>What does energy do to water storage?</p> <p>How do I keep plumbing fixtures working properly?</p>	<p>Apprentice Future Installer</p> <p>What is a fixture</p> <p>The difference between fixtures and appliances</p> <p>Install and identify typical fixtures and associated trim</p> <p>Determine how a heater and water softener is used and what science technologies are used</p>	<p>Determine what makes a fixture a fixture and differences to appliances</p> <p>Explain how flush devices work and the operating principle of all plumbing fixtures.</p> <p>Identify all common fixtures and trim that applies to fixtures.</p> <p>Explain how water heaters functions and how water softeners relate to water supply and the treatment of water conditions</p>	<p>Written/Oral Quizzes Written Chapter Tests Daily Practice Observation Visual Inspection of fixture use & personal projects Evaluation/Test</p>	<p>American Technical Publishing Software (ATP) Manufacturer's Web pages of Trim Computer Information on Installation practices Internet Research Nccer Level one module 10</p>

CAREER MAJOR COURSE: Plumbing Fixtures and Fittings

MONTH: Level 3 Feb-April, S2 B2

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
<p>Plumbing Proficiencies #42, 48, 94</p> <p>9.3.12.AC.6 9.3.12.AC-MO.2 9.3.12.AC-MO.3 9.3.12.AC-DES.8 9.3.12.AC-DES.3 CRP1-12</p>	<p>What is common among all fixtures?</p> <p>When do appliances have bearing or taxing on piping systems?</p> <p>How is the environment affected by plumbing and how do I protect it?</p> <p>Why does my selection of fixtures save the environment?</p>	<p>Apprentice Future Installer</p> <p>What is a fixture</p> <p>The difference between fixtures and appliances</p> <p>Install and identify typical fixtures and associated trim</p> <p>Determine how a heater and water softener is used and what science technologies are used</p>	<p>Students will be able to:</p> <p>Determine what makes a fixture, a fixture and differences to appliances</p> <p>Explain how flush devices work and the operating principle of all plumbing fixtures.</p> <p>Identify all common fixtures and trim that applies to fixtures.</p> <p>Explain how a water heater functions and how water softeners relate to water supply.</p>	<p>Written/Oral Quizzes Written Chapter Tests Daily Practice Observation Visual Inspection of fixture use & personal projects Evaluation/Test</p>	<p>American Technical Publishing Software (ATP) Manufacturer's Web pages of Trim Computer Information on Installation practices Internet Research Nccer Level one module 10</p>

CAREER MAJOR COURSE: Blueprints and Plumbing Isometrics Drawings

MONTH: Level 3 April, May, June S2 B2

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
<p>Plumbing Proficiencies #31, 32, 16</p> <p>9.3.12.AC.1 9.3.12.AC-DES.8 9.3.12.AC.6 9.3.12.AC-DES.4 9.3.12.AC.6 RST.11-12.1 RST.11-12.3.</p>	<p>What are common misconceptions about measuring?</p> <p>How are scale drawings similar to/different from actual buildings?</p> <p>How do I use a standard ruler when reading prints?</p> <p>How is reading documents connected to the installation of systems?</p>	<p>Apprentice Blueprint/Isometrics Riser Diagrams</p> <p>Learning how and when to use blueprints vs shop sets</p> <p>How scale ruler is used in print reading</p> <p>How to read a scale ruler and how it relates to a standard ruler</p> <p>How to relate the rules of a scale ruler to a standard ruler</p> <p>Nccer level one Module five</p>	<p>Students will be able to:</p> <p>Read a scale ruler.</p> <p>Convert linear measurements to scale measurements.</p> <p>Develop isometrics</p> <p>Develop risers</p> <p>Interpret drawings and symbols.</p> <p>Make drawings using cad systems or similar</p> <p>Make 3d drawings by Cad related software</p>	<p>Written/Oral Quizzes Written Chapter Tests Daily Practice Observation Visual Evaluation/Test Projects Blueprint reading of scale measurements</p>	<p>American Technical Publishing Software (ATP) Internet Scale Information/Research</p> <p>Nccer level one module five</p>

CAREER MAJOR COURSE: Business Law for Plumbers MONTH: Level 4 Sept - Dec S1 B3

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS
<p>9.3.12.AC.1 9.3.12.AC.3 9.3.12.AC.5 9.3.12.AC-DES.4 9.3.12.BM.2 9.3.12.BM-MGT.2</p>	<p>What is business law for plumbers?</p> <p>Why do we need contracts and agreements?</p> <p>Who is the Plumbing Board of examiners?</p> <p>What does IRS mean?</p> <p>Who has to comply with all these rules of business?</p> <p>What documents are needed to be compliant?</p> <p>How do I make an Invoice?</p> <p>What is sales tax?</p> <p>What is a markup/profit?</p>	<p>Filling in invoice documents.</p> <p>Codes and tax laws</p> <p>What a plumber should charge to make a profit.</p> <p>Quarterly forms.</p> <p>The role of an accountant.</p>	<p>Student will be able to:</p> <p>Identify proper forms</p> <p>Identify proper statements</p> <p>Be familiar with tax laws</p> <p>Understand paper work relevant to proper business transactions</p> <p>Realize the importance of Fair business.</p>	<p>Written/Oral Quizzes</p> <p>Written Chapter Tests</p> <p>Daily Practice</p> <p>Observation</p> <p>Visual Evaluation/Test Projects</p> <p>Compare New Jersey standards</p>

CAREER MAJOR COURSE: Business Application /Marketing

MONTH: Level 4 - Dec -Jan S1 B3

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
9.3.12.AC.1 9.3.12.AC.3 9.3.12.BM.2 9.3.12.BM-MGT.2 9.3.12.BM-MGT.8 WHST.11-12.1. WHST.11-12.4. WHST.11-12.6	What is Marketing a business? What sells a product? How do I use sponsors to help my market plan?	Creating a plan Developing interest in your service or products Collaboration with sponsor companies	Selling your plan Advertisements Promotions Sales skills Developing a collaborative agreement with the industry. Create a brochure Build a website	Visual applications Visual observations Portfolio Assessment Test/quiz	NCCER text Phcc website. NJPhcc.com. Google search engine

Career Major Course

Contracts and Legal Documents

Month Level 4

Feb- March

S2 B3

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS
9.3.12.AC.1 9.3.12.AC.3 9.3.12.BM.2 9.3.12.BM-MGT.2 9.3.12.AC-CST.1	What is a contract? What are business documents? What are trade terms for documents?	Making a contract. Filing documents The use of proper words when filling out a document Nccer textbook level 2 Plumbers Law book	Developing terms of agreements. Gaining an understanding of legal values, obligations, and liabilities Develop a trade terms vocabulary of contract words for basic agreements related to business transactions.	Visual applications Visual observations Portfolio assessment Test/quiz

Career Major Course Troubleshooting Maintenance and Repairs Month Level 4 April- June S2B3

STANDARDS	ESSENTIAL QUESTIONS	CONTENT	SKILLS	ASSESSMENTS	OTHER
9.3.12.AC.3 9.3.12.AC-MO.2 9.3.12.AC-MO.3 9.3.12.AC-MO.4 9.3.12.AC-MO.5	What are maintenance requirements for plumbing? What are the parts that I will need to fix the fixture? How will I take that apart and then reassemble it successfully? How do I fix that pipe in its place? What are my choices to make that repair? What defines an Ordinary repair?	Fixture repairs Valve repairs Seal repairs and replacement Filter replacements. Purification of piping. Changing faucets and washers.	Provide service to basic plumbing fixtures. Develop a sequence for ongoing routine maintenance. Determine the need for repair or replacement. Establish industry methods for maintenance and ordinary repairs	Visual applications Visual observations Portfolio assessment Test/quiz	Modern plumbing text. NCCER level 2 NSPC model Plumbing Code. Uniform Construction Code NJ 5;23 ordinary repairs

Texts:

Modern Plumbing	7th	G-W	2010	978-1-60525-236-0
Modern Plumbingworkbook	7th	G-W	2010	978-1-60525-237-7
Plumbing DNS	3rd	ATP	2006	0-8269-0631-1
Planning DWV	2nd	Craftsman	1990	0-934041-51-2
Plumbing A House	2nd	Taunton	1994	1-942391-40-3