

PLUMBING TECHNOLOGY MISSISSIPPI CURRICULUM FRAMEWORK

Plumbing Technology CIP: 46.0503 (Plumbing Technology)

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The Office of Curriculum and Instruction (OCI) was founded in 2013 under the Division of Workforce, Career, and Technical Education at the Mississippi Community College Board (MCCB). The office is funded through a partnership with The Mississippi Department of Education (MDE), who serves as Mississippi's fiscal agent for state and federal Career and Technical Education (CTE) Funds. The OCI is tasked with developing statewide CTE curriculum, programming, and professional development designed to meet the local and statewide economic demand.

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INDUSTRY JOB PROJECTION DATA

A summary of occupational data is available from the Mississippi Department of Employment Security.

<https://mdes.ms.gov/information-center/labor-market-information/>

ARTICULATION

Check with the local community college CTE administration for articulation agreements.

INDUSTRY CREDENTIALS, CERTIFICATIONS, AND PROFESSIONAL LICENSURE

See the “Industry Credentials, Certifications, and Professional Licensure”

<https://www.mccb.edu/assessment>

DUAL ENROLLMENT

See the “Procedures Manual For Dual Enrollment and Accelerated Programs”

http://www.mississippi.edu/cjc/dual_enrollment.asp

Research Abstract

The curriculum framework in this document reflects the changes in the workplace and a number of other factors that impact local technical programs. Federal and state legislation calls for articulation between high school and community college programs, integration of academic and vocational skills, and the development of sequential courses of study that provide students with the optimum educational path for achieving successful employment. National skills standards, developed by industry groups and sponsored by the U.S. Department of Education and Labor, provide vocational educators with the expectations of employers across the United States. All of these factors are reflected in the framework found in this document.

Revision History

2011, Research and Curriculum Unit, Mississippi State University

2018, Office of Curriculum and Instruction, Mississippi Community College Board

2024, Office of Curriculum and Instruction, Mississippi Community College Board

Program Description

The Plumbing Technology program prepares a person for advanced placement in plumbing and related fields. Graduates of this program can take the journeyman exam and become employed as supervisors, instructors, material expeditors, inspectors, estimators, consultants, employers, or contractors. This document was developed with the use of the competencies and objectives as prepared by the National Center for Construction Education and Research, along with applicable national, state, and local codes. The Plumbing Technology program offers a Career certificate, Technical certificate and/or an Associate of Applied Science Degree.

Suggested Course Sequence

Work Ready Certificate

Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours
PCT 1113	Intro to Plumbing	3	2	3	30
PCT 1333	Plumbing Prints and Code	2	1	4	30
PCT 1622	Gas Piping	2	0	2	30
PCT 1523	Intro to Water Distribution	3	1	4	30
PCT 1513	Intro to Drain Waste and Ventilation	3	1	4	30
PCT 1722	Intro To Plumbing Fixtures	2	1	2	30
	Total	15			

Career Certificate

Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours
PCT 1113	Intro to Plumbing	3	2	3	30
PCT 1722	Intro to Plumbing Fixtures	2			
PCT 1333	Plumbing Prints and Code	3	1	4	30
PCT 1622	Gas Piping	2		2	30
PCT 1713	Intro to Water Distribution	3	1	4	30
PCT 1513	Intro to Drain, Waste and Vent	3	1	4	30
PCT 1622	Gas Piping	2	1	2	30
PCT 1612	Intro to Water Heating	2			30
PCT 1634	Service Plumbing	2		4	30
PCT 2113	Advanced Print Reading and Estimating	2	1	2	30
PCT 2123	Drain Cleaning and Equipment				
PCT 2133	Commercial Plumbing Fixtures	3	1	4	30
PCT2143	Intro to Underground Sewer Water and Gas				
	Instructor Approved Electives Per local community college	4			
	Total	30			

Technical Certificate

Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours
PCT 2212	Service Lab	2		2	30
PCT 2222	Fixtures Lab	2			
PCT 1732	Advanced Water Principles	3			
PCT 2232	Advanced Drainage Principles	3			
PCT 2313	Plumbing Management and Leadership	2			
	Instructor Approved Electives Per local community college	3			
	Total	15			

Electives

BOT 1413	Business Accounting	3 sch: See Appropriate Program Description
BOT 1713	Mechanics of Communication	3 sch: See Appropriate Program Description
CST 1123	Basic Computer Systems	3 sch: See Appropriate Program Description
CPT 2133	Career Development	3 sch: See Appropriate Program Description
DDT 1213	Construction Materials	3 sch: See Appropriate Program Description
MMT 1313	Salesmanship	3 sch: See Appropriate Program Description
MMT 2213	Management	3 sch: See Appropriate Program Description
MMT 2513	Entrepreneurship	3 sch: See Appropriate Program Description
PCT 292(1-6)	Supervised Work Experience in Plumbing Technology	1-6 sch: 3-18 hr. externship
WBL 191(1-3) WBL 192(1-3) WBL 193(1-3) WBL 291(1-3) WBL 292(1-3) WBL 293(1-3)	Work-Based Learning	1-3 sch: 3-9 hr. externship
	Instructor Approved Electives per local community college.	

General Education Core Courses

To receive the Associate of Applied Science degree, a student must complete all of the required coursework found in the Career Certificate option, Technical certificate option, and a minimum of 15 semester hours of General Education core. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester or provided primarily within the last semester. Each community college will specify the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science degree at their college. The Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) Section 9 Standard 3 of the *Principles of Accreditation: Foundations for Quality Enhancement*¹ describes the general education core.

Section 9 Standard 3:

3. The institution requires the successful completion of a general education component at the undergraduate level that
 - a) is based on a coherent rationale.
 - b) is a substantial component of each undergraduate degree program. For degree completion in associate programs, the component constitutes a minimum of 15 semester hours of the equivalent; for baccalaureate programs, a minimum of 30 semester hours or the equivalent.
 - c) ensures breadth of knowledge. These credit hours include at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural science/mathematics. These courses do not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession.

General Education Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
	Humanities/Fine Arts	3						
	Social/Behavioral Sciences	3						
	Math/Science	3						
	Academic electives	6						
	TOTAL	15						

¹ Southern Association of Colleges and Schools Commission on Colleges. (2017). *The Principles of Accreditation: Foundations for Quality Enhancement*. Retrieved from <http://www.sacscoc.org/2017ProposedPrinc/Proposed%20Principles%20Adopted%20by%20BOT.pdf>

Course Number and Name: PCT 1113 Intro to Plumbing

Description: This course includes basic safety, an introduction to construction math, and introduction to hand and power tools, an introduction to construction drawings, and rigging. (3 sch: 2 hr lecture, 2 hr lab).

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	30

Prerequisite: None

Student Learning Outcomes:

1. Describe general safety rules for working in a shop/lab and industry.
 - a. Describe how to avoid on-site accidents.
 - b. Explain the relationship between housekeeping and safety.
 - c. Explain the importance of following all safety rules and company safety policies according to OSHA standards including addressing General Duty Clause and 1926 CFR Subpart C.
 - d. Explain the importance of reporting all on-the-job injuries, accidents, and near misses.
 - e. Explain the need for evacuation policies and the importance of following them.
 - f. Explain the employer's substances abuse policy and how it relates to safety
 - g. Explain the safety procedures when working near pressurized or high temperature.
2. Identify and apply safety around welding operations.
 - a. Use proper safety practices when welding or working around welding operations.
 - b. Use proper safety practices when welding in or near trenches and excavations.
 - c. Explain the term proximity work.
3. Identify and explain use of various barriers and confinements.
 - a. Explain the safety requirements for working in confined areas.
 - b. Explain and practice lockout/tagout procedures
 - c. Explain the different barriers and barricades, and how they are used.
 - d. Recognize and explain personal protective equipment.
 - e. Inspect and care for personal protective equipment.
4. Explain lifting, fall protection, and the use of ladders and scaffolds.
 - a. Identify and explain the procedures for lifting heavy objects.
 - b. Explain fall protection procedures.
 - c. Inspect and safely work with various ladders and scaffolds
5. Explain the Material Safety Data Sheet (MSDS).
 - a. Explain the function of the MSDS.
 - b. Interpret the requirements of the MSDS.
6. Explain fires.
 - a. Explain the process by which fires start.
 - b. Explain fire prevention of various flammable liquids.
 - c. Explain the classes of fire and the types of extinguishers.
7. Explain safety in and around electrical situations.
 - a. Explain injuries when electrical contact occurs.
 - b. Explain safety around electrical hazards.
 - c. Explain action to take when an electrical shock occurs.

8. Apply basic mathematics for residential carpentry.
 - a. Apply the four basic math skills with whole numbers, fractions, and percent.
 - b. Use the metric system.
 - c. Identify and read measuring tools.
 - d. Solve basic algebraic equations.
 - e. Calculate area and volume of simple geometric figures.
 - f. Apply basic math to solve simple geometric figures and problems.
9. Demonstrate the use and maintenance of hand and power tools.
 - a. Identify and discuss the use of common hand and power tools.
 - b. Discuss rules of safety for hand and power tools.
 - c. Select and demonstrate the use of tools.
 - d. Explain the procedures for maintenance.
10. Read, analyze, and design a construction drawing.
 - a. Identify terms and symbols commonly used on construction drawings.
 - b. Interpret various symbols to locate various elements.
 - c. Interpret a plan to determine layout.
 - d. Interpret basic electrical specifications.
 - e. Interpret electrical drawings, including site plans, floor plans, and detail drawings.
 - f. Read equipment schedule.
 - g. Explain basic layout of a construction drawing.
 - h. Describe the information in a title block.
 - i. Identify the lines used on construction drawings.
 - j. Explain the architect's and engineer's scales.
 - k. Design a construction drawing.
 - l. Construct a structure based on a construction drawing.
11. Explain and identify safe rigging and equipment.
 - a. Explain and practice safe rigging.
 - b. Identify and explain rigging equipment.
 - c. Inspect rigging equipment.
12. Describe employment opportunities and responsibilities.
 - a. Describe employment opportunities including potential earnings, employee benefits, job availability, and places of employment, working conditions, and educational requirements.
 - b. Describe basic employee responsibilities.
13. Demonstrate the ability to follow verbal and written instructions and communicate effectively in on-the-job situations.
14. Safely handle and store materials.
 - a. Define a load.
 - b. Establish a pre-task plan prior to moving a load.
 - c. Use proper materials-handling techniques.
 - d. Choose appropriate materials-handling equipment for the task.
 - e. Recognize hazards and follow safety procedures required for materials handling
15. Identify and discuss basic fittings and valves related to plumbing.
16. Identify and install hangers, supports, structural, penetrations, and fire stopping materials.

Course Number and Name: PCT 1333 Plumbing Prints and Code

Description: An in-depth understanding of blueprint reading related to plumbing profession

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	1	4	30

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Identify and interpret various symbols, notes, and terms.
 - a. Identify terms, symbols, abbreviations, and lines used on blueprints.
 - b. Interpret notes, specifications, and dimensions. Explain related structures.
2. Identify, interpret, and locate details on mechanical, plumbing and structural blueprints.
 - a. Identify the three basic views of a drawing.
 - b. Identify the various lines used on drawings.
 - c. Interpret dimensions and symbols.
 - d. Interpret general and specific notes on drawings.
 - e. Verify dimensions shown on drawings and generate an RFI when discrepancies are found.
 - f. Locate details on drawings.
 - g. Order materials needed as interpreted from specifications/blueprints.
 - h. Interpret isometric views of plumbing drawings.

Course Number and Name: PCT 1513 Intro to Drain Waste and Vent

Description: Information and practical aspects of drainage and disposal systems and the International Plumbing Code. Included are the installation of the drainage system in a residential unit covering health aspects and the disposal of poisonous gases arising from the discharge of traps. Instruction is provided on elements of disposal systems, including sewer, septic tanks, tank size calculations, maintenance causes, and removal of sewer obstructions.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	1	4	45

Prerequisite: Instructor Approved

Student Learning Outcomes

1. Identify and explain safety in drainage and sewer systems.
 - a. Identify and explain health department regulations for drainage and sewer systems.
 - b. Identify and explain hazards of working in confined spaces in the presence of methane gas.
 - c. Identify international plumbing code definitions.
 - d. Identify local authority for plumbing installation.
 - e. Identify approved traps and cleanouts
2. Identify various systems used in drainage and sewer systems.
 - a. Explain safety procedures.
 - b. Identify components of individual sewer systems.
 - c. Identify various types of vents and drains, including storm
3. Install various types of soil and waste pipes.
 - a. Install different types of traps.
 - b. Install stacks according to functions
4. Identify various types of sewers.
 - a. Differentiate between sanitary, storm, and combined sewers.
 - b. Identify sanitary and storm sewers.
 - c. Estimate the drainage fixture unit (DFU).
 - d. Estimate the storm sewer fixture unit.

Course Number and Name: PCT 1612 Intro to Water Heating

Description: Information on local codes for installing and repairing water heaters, force air units, and floor furnaces.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
2	1	2	30

Prerequisite: Instructor Approved

Student Learning Outcomes

1. Identify and perform various functions on
 - a. hot water system.
 - b. Identify and explain safety procedures.
 - c. Identify and explain parts of a tank and tankless water heater.
 - d. Install a tank and tankless water heater, including T&P valves.
 - e. Replace a dip tube.
 - f. Construct a venting system for gas water heaters.
 - g. Perform repairs on gas and electric water heaters.

2. Identify, install, troubleshoot, and perform various functions on heating systems.
 - a. Identify and discuss the safety techniques of installing and maintaining heating systems.
 - b. Troubleshoot and repair a force air heating system.
 - c. Determine if the venting system for a force air heating system is adequate.
 - d. Identify proper methods of venting appliances.
 - e. Identify proper types of gas controls.
 - f. Connect appliances to specifications.
 - g. Adjust or replace ignition devices on gas appliances.

Course Number and Name: PCT 1622 Gas Piping

Description: Information on standard gas codes. The safe installation of gas appliances and gas lines, according to codes, will be included.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
2	1	2	30

Prerequisite: Instructor Approved

Student Learning Outcomes

1. Identify and explain the various codes pertaining to gas and plumbing installation.
 - a. Identify local authority for gas installation.
 - b. Identify International Fuel Gas Code definitions.
 - c. Identify installation requirements for undiluted liquefied petroleum gas.
 - d. Explain and utilize International Fuel Gas Code for installation requirements for specific appliances, residences, and apartments.
 - e. Identify general regulations.

2. Identify appliances and materials for gas and plumbing installations.
 - a. Identify approved gas appliances and materials.
 - b. Identify approved joints and connections and methods of hanging and supporting.
 - c. Apply approved methods for safely testing lines using a manometer.

3. Explain, size, and install a gas system as per the principles of the British Thermal Unit (BTU).
 - a. Explain the BTU principles.
 - b. Size using the longest length method.
 - c. Install a gas piping system per given BTU requirements.

Course Number and Name: PCT 1713 Intro to Water Distribution

Description: Information on the installation of a hot water system according to the unit fixture system. Also information on sizing and installation of a potable cold water system.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
2	1	4	30

Prerequisite: Instructor Approved

Student Learning Outcomes

1. Estimate and install a hot water system.
 - a. Estimate a hot water supply fixture unit (HWSFU).
 - b. Estimate the size of a hot water heater or storage tank.
 - c. Explain and install a forced and natural circulating hot water system.

2. Identify and install a potable cold water system.
 - a. Estimate a cold water supply fixture unit (CWSFU).
 - b. Discuss safety precautions in installing and repairing potable water systems.
 - c. Identify potable water and water mains.
 - d. Identify and install a water treatment system.
 - e. Identify and install water service and fixture branches and supplies.
 - f. Identify and install water meters.
 - g. Install a distribution system.
 - h. Identify and install a water hammer arrester.
 - i. Install a pressure-reducing valve and bypass

Course Number and Name: PCT 1722 Intro to Plumbing Fixtures

Description: Information on the installation of the rough-in and finish fixtures used in the plumbing construction according to International Plumbing Code.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
2	0	4	30

Prerequisite: Instructor Approved

Student Learning Outcomes

1. Explain the procedures and install bathroom fixtures according to local, state, and/or international codes.
 - a. Explain and install a lavatory, tub, and shower.
 - b. Explain and install a water closet.
2. Explain the procedures and install other fixtures according to local, state, and/or international codes.
 - a. Explain and install washer boxes and an icemaker box.
 - b. Explain and install urinals.
 - c. Explain and install service sinks and mop sinks.
 - d. Explain and install drinking fountains and a water filtering system.
 - e. Explain and install a kitchen sink, garbage disposal, and dishwasher.
 - f. Explain and identify other approved plumbing fixtures.

Course Number and Name: PCT 1911(1-3) Special Project in Plumbing

Description: Practical application of skills and knowledge gained in other technical courses. The instructor works closely with the student to ensure that the selection of a project will enhance the student's learning experience.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
2	0	2	30

Prerequisite: Instructor Approved

Student Learning Outcomes

1. Develop a written plan that details the activities and projects to be completed.
 - a. Utilize a written plan that details the activities and projects to be completed.
 - b. Perform written occupational objectives in the special project.
2. Assess accomplishment of objectives.
 - a. Prepare a daily written assessment of accomplishment of objectives.
 - b. Present weekly written reports to the instructor about activities performed and objectives accomplished.
3. Utilize and follow a set of written guidelines for the special project.
 - a. Develop and follow a set of written guidelines for the special project.

Course Number and Name: PCT 292 (1-6) Supervised Work Experience in Plumbing

Description: This course is a cooperative program between industry and education and is designed to integrate the student's studies with industrial experience. Variable credit is awarded on the basis of semester hour per 45 industrial contact hours.

Hour Breakdown:

Semester Credit Hours	Lecture	Externship	Lab	Contact Hours
1-6	1	3-18	0	30

Prerequisite: Instructor Approved

Student Learning Outcomes

1. Apply technical skills needed to be a viable member of the workforce.
 - a. Prepare a description of technical skills to be developed.
 - b. Develop technical skills needed to be a viable member of the workforce

2. Apply skills developed in other program area courses.
 - a. Perform skills developed in other program area courses.

3. Apply human relationship skills.
 - a. Practice human relationship skills in the program.

4. Apply and practice positive work habits and responsibilities.
 - a. Perform assignments to develop positive work habits and responsibilities.

5. Work with the instructor and employer to develop written occupational objectives to be accomplished.
 - a. Perform written occupational objectives.

6. Assess accomplishment of objectives.
 - a. Prepare daily written assessment of accomplishment of objectives.
 - b. Present weekly written reports to the instructor about activities performed and objectives accomplished.

7. Utilize a set of written guidelines.
 - a. Develop and follow a set of written guidelines.

Course Number and Name: WBL 191 (1-3) WBL 192 (1-3), WBL 193(1-3), WBL 291(1-3), WBL 292(1-3), and WBL 293(1-3)

Description: A structured workplace learning experience in which the student, program area teacher, work-based learning coordinator, and workplace supervisor/mentor develop and implement an educational training agreement. Designed to integrate the student's academic and technical skills into a work environment. May include regular meetings and seminars with school personnel and employers for supplemental instruction and progress reviews. (1-3 sch: 3-9 hr externship).

Hour Breakdown:

Semester Credit Hours	Lecture	Contact Hours
1-3	0	0

Prerequisite: Instructor Approved

Student Learning Outcomes

1. Apply technical skills and related academic knowledge needed to be a viable member of the workforce.
 - a. Demonstrate technical skills necessary to complete job requirements.
 - b. Demonstrate academic skills necessary to complete job requirements.
 - c. Perform tasks detailed in an educational training agreement at the work setting

2. Apply general workplace skills to include positive work habits necessary for successful employment.
 - a. Demonstrate appropriate human relationship skills in the work setting to include conflict resolution, team participation, leadership, negotiation, and customer/client service.
 - b. Utilize time, materials, and resource-management skills.
 - c. Use critical-thinking skills, such as problem solving, decision making, and reasoning.
 - d. Acquire, evaluate, organize, maintain, interpret, and communicate information.

Course Number and Name: PCT 2232 Advanced Drainage Principles

Description: The course provides a comprehensive understanding of septic systems, sewage ejector systems and sump pump systems, exploring their functions, components, and maintenance requirements. Participants will gain practical knowledge to design, install, and troubleshoot these crucial systems for effect wastewater management.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	1	4	30

Prerequisite: Intro to drain waste and vent

Student Learning Outcomes:

1. Septic Systems
 - a. Types of septic systems.
 - b. Design principles and considerations.
 - c. Installation and construction guidelines.

2. Sewage Ejector Systems
 - a. Role and Significance in building plumbing.
 - b. Components and operation of sewage ejector pumps.
 - c. Installation requirements and consideration.
 - d. Troubleshooting common issues.

3. Sump Pump Systems
 - a. purpose and functionality of sump pumps
 - b. types of sump pump systems.
 - c. Installation guidelines for different settings.
 - d. Maintenance and troubleshooting techniques

Course Number and Name: PCT 2113 Advanced print reading and estimating

Description: This course is designed for students to enhance their expertise in blueprint reading and project estimation. Students can expect to learn about detailed plans, specifications, and calculations related to plumbing installations, as well as advanced techniques for accurate cost estimation in the plumbing industry.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	1	4	30

Prerequisite: Plumbing prints and code

Student Learning Outcomes:

1. Blueprint Interpretations
 - a. Students will learn to read and interpret commercial plumbing, structural, and architectural blueprints.
Interpretation of isometric and orthographic drawings.
2. Understanding building systems.
 - a. Gain an understanding of commercial plumbing systems and how they interrelate within a construction project
3. Materials and equipment knowledge
 - a. Develop expertise in identifying and selecting the appropriate materials, fixtures, and equipment for plumbing construction project.
4. Estimating skills
 - a. Acquire estimating skills, including the ability the calculate quantities of materials required for a project, assess labor costs, and provide accurate cost estimates.

Course Number and Name: PCT 1732 Advanced Water Principles

Description: This comprehensive course is designed to provide in-depth knowledge and practical skills related to water booster pumps, recirculation pumps, and well pumps in water supply systems. Participants will gain a thorough understanding of the principles, operation, maintenance and troubleshooting techniques associated with critical components of water distribution.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	1	4	30

Prerequisite: Intro to water distribution

Student Learning Outcomes:

1. Water Booster Pumps
 - a. Introduction to booster pump systems.
 - b. Pump selection criteria
 - c. Performance characteristics and efficiency.
 - d. Installation and configuration best practices.
 - e. Troubleshooting common issues

2. Recirculation Pumps
 - a. Purpose and benefits of recirculation systems.
 - b. Pump types suitable for recirculation.
 - c. System design considerations.
 - d. Energy efficiency and optimization.
 - e. Hands-on exercises on recirculation system setup.

3. Well Pumps
 - a. Understanding well pump systems.
 - b. Types of well pumps (submersible, jet, etc)
 - c. Installation and maintenance procedures.
 - d. Groundwater monitoring and well management.
 - e. Emergency response and contingency planning

Course Number and Name: PCT 2123 Drain Cleaning and Equipment

Description: This class is designed to provide participants with a comprehensive understanding of drain cleaning techniques, tools, and equipment. Students will learn the fundamentals of maintaining and clearing drainage systems, with a focus on both residential and commercial settings. The course integrates theoretical knowledge with hands-on practical skills to ensure participants are well-equipped to handle real-world drain cleaning scenarios.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
2	1	4	30

Prerequisite: Intro to drain waste and vent

Student Learning Outcomes:

1. Drain cleaning tools and equipment
 - a. Introduction to various drain cleaning tools and equipment.
 - b. Hands-on training with augers, snakes, and other specialized tools.
 - c. Understanding the use of videos inspection equipment.
2. Safety Procedures
 - a. Importance of safety in drain cleaning.
 - b. Personal protective equipment (PPE) requirements.
 - c. Hazard identification and mitigation.
3. Types of Blockages
 - a. Identifying different types of blockages.
 - b. Strategies for clearing common blockages.
 - c. Dealing with more complex issues.
4. Preventive Maintenance
 - a. developing preventative maintenance schedules.
 - b. Tips for clients on avoiding drain issues.
 - c. Long-term strategies for maintain drainage systems.
5. Troubleshooting
 - a. diagnosing draining problems.
 - b. Problem-solving techniques.
 - c. case studies and real world scenarios

Course Number and Name: PCT 2143 Intro to underground gas, sewer and water

Description: This course is designed to provide students with a foundational understanding of underground utility systems with a focus on gas, sewer and water infrastructure.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	1	4	30

Prerequisite: Plumbing and Prints Code

Student Learning Outcomes:

1. Introduction of Utility Systems
 - a. Student will gain a basic understanding of underground utility systems.
2. Safety Procedures
 - a. Emphasis on excavation safety protocols and best practices related to working with underground utility systems, including the handling of gas, sewer and water components.
3. Components and Materials
 - a. Detailed study of the various components, materials and equipment used in underground gas, sewer and water systems, such as pipes, valves meters and fitters.
4. Installation and Maintenance
 - a. Learning the fundamentals of installation and maintenance procedures for these underground utility systems, including excavation techniques and trenchless methods.
5. Regulation and codes.
 - a. Understanding the relevant local and state regulations and building codes governing the installation and maintenance of underground utilities.

Course Number and Name: PCT 2222 Fixtures Lab

Description: The lab course is designed to give students practical experience in working with plumbing fixtures commonly found in residential and commercial buildings. Emphasis will be placed on installation for various plumbing fixtures.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
2	1	2	30

Prerequisite: Intro to Plumbing fixtures, Commercial plumbing fixtures

Student Learning Outcomes:

1. Installation Techniques
 - a. Hands-on installation of different plumbing fixtures.
 - b. proper use of tools and materials for fixture installation.
 - c. adherence to plumbing codes and regulations.

Course Number and Name: PCT 2313 Plumbing Management and Leadership

Description: This course is designed to prepare individuals for leadership roles within the plumbing industry. It integrates technical knowledge with management and leadership skills to equip students with a comprehensive understanding of plumbing operations and the ability to effectively lead a plumbing team or manage a plumbing business.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	1	4	30

Prerequisite: Second semester classes

Student Learning Outcomes:

1. Business Management
 - a. Business planning and strategy for plumbing firms.
 - b. Financial management and budgeting.
 - c. Marketing and customer relations in the plumbing industry.
2. Leadership Development
 - a. effective communication in a plumbing context.
 - b. team building and conflict resolution.
 - c. Motivation and leadership styles.
3. Project Management
 - a. Planning and executing plumbing projects.
 - b. Resource allocation and scheduling.
 - c. Quality control and project evaluation.

Course Number and Name: PCT 1634 Service Plumbing

Description: This class is designed to equip individuals with the knowledge and skills needed to perform maintenance, troubleshooting, and repair tasks in plumbing systems.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	1	4	30

Prerequisite: Intro to plumbing

Student Learning Outcomes:

1. Troubleshooting
 - a. Developing skills to identify and diagnose plumbing problems such as leaks, clogs, and faulty components.
2. Repair techniques
 - a. Learning practical repair techniques for addressing common plumbing issues. This may include fixing leaks, clearing clogs, replacing damaged pipes, and repairing or replacing fixtures.
3. Customer Service
 - a. Developing effective communication and customer service skills, as plumbing professionals often work directly with clients. This includes explaining problems, providing estimates, and ensuring customer satisfaction.
4. Preventive Maintenance
 - a. Learning about proactive measures to prevent plumbing issues and prolong the lifespan of plumbing systems.

Course Number and Name: PCT 2212 Service Lab

Description: This lab based course is designed to provide students with practical, hands-on experience in the field of service plumbing. Participants will engage in a series of exercises and projects that cover a range of plumbing service tasks commonly encountered in residential, commercial, and industrial settings. Emphasis will be placed on troubleshooting, repair and maintenance of plumbing systems.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
2	1	2	30

Prerequisite: Service Plumbing

Student Learning Outcomes:

1. Diagnostic Techniques
 - a. Identifying and diagnosing common plumbing issues.
 - b. Use of testing equipment and tools for problem assessment.
2. Repair and Maintenance
 - a. Hands on experience in repairing leaks, clogs, and other plumbing issues
 - b. Maintenance procedures for different plumbing fixtures and systems.
3. Pipe Systems
 - a. Understanding and working with various types of pipes (e.g., copper, PVC, PEX).
 - b. Installation, repair, and replacement of pipes.
4. Fixtures and Appliances
 - a. Installation and maintenance of plumbing fixtures such as sinks, faucets, toilets, and water heaters.
 - b. Troubleshooting and repairing plumbing appliances.

Appendix A: Recommended Tools And Equipment Plumbing Technology

Non-capitalized items

Capitalized items

Recommended Instructional Aid

It is recommended that instructors have access to the following items:

“Other equipment items can be added when deemed appropriate by the community by the community college industry craft committee or by industry/business training requirements

Appendix B: Recommended Textbook List

Recommended Plumbing Technology Text Book List CIP: 45.0503- Plumbing Technology		
Book Title	Author (s)	ISBN
G-W Modern Plumbing Ninth Edition	E. Keith Blankenbaker	978-1-64564-668-6
G-W Modern Plumbing Ninth Edition Lab Book	E. Keith Blankenbaker	978-1-64564-46709
Print Reading for Construction	Walter C. Brown	978-1-63126-922-6
Print Reading for Construction Large Prints	Daniel P. Doftmueller	978-1-63126-922-6

Appendix C: Course Crosswalks

<p style="text-align: center;">Course Crosswalk Plumbing Technology Program CIP: 45.0503 Plumbing Technology Plumber</p>					
<i>Note: Courses that have been added or changed in the 2019 curriculum are highlighted.</i>					
Existing			Revised		
2015 MS Curriculum Framework			2024 MS Curriculum Framework		
Course Number	Course Title	Hours	Course Number	Course Title	Hours
PCT 1113	Fundamentals of Plumbing	3	PCT #####	Advanced Drainage Principles	3
PCT 1333	Blueprint Reading for Plumbing	3	PCT #####	Advanced Print reading and Estimating	2
PCT 1443	Piping Level/Transit	3	PCT #####	Drain Cleaning and equipment	2
PCT 1513	Drainage and Sewer Systems	3	PCT 1513	Intro to underground Gas, Sewer, and Water	3
PCT 1612	Heating Devices	2	PCT #####	Intro to Plumbing Fixtures	2
PCT 1622	Gas Piping	2	PCT #####	Plumbing Management and Leadership	2
PCT 1712	Domestic Systems	2	PCT #####	Service Plumbing	3
			PCT #####	Commercial Plumbing Fixtures	3
PCT 1722	Plumbing Fixtures Lab	2	PCT #####	Service Lab	2
PCT 1743	Advanced Plumbing Lab	3	PCT #####	Advanced Water Principles	3
PCT 1113	Fundamentals of Plumbing	3	PCT1713	Intro to Water Distribution	3
PCT 1333	Blueprint Reading for Plumbing	3	PCT 1333	Plumbing Prints and Code	3
PCT 1513	Drainage and Sewer Systems	3	PCT 1513	Intro To Drain Waste and Vent	3
PCT 1612	Heating Devices	2	PCT 1612	Intro to Water Heating	2
PCT 1622	Gas Piping	2	PCT 1622	Gas Piping	2
PCT 1113	Fundamentals of Plumbing	3	PCT 1113	Intro to Plumbing	3
			PCT #####	Plumbing Fixtures Lab	2
			PCT #####	Special Projects	2