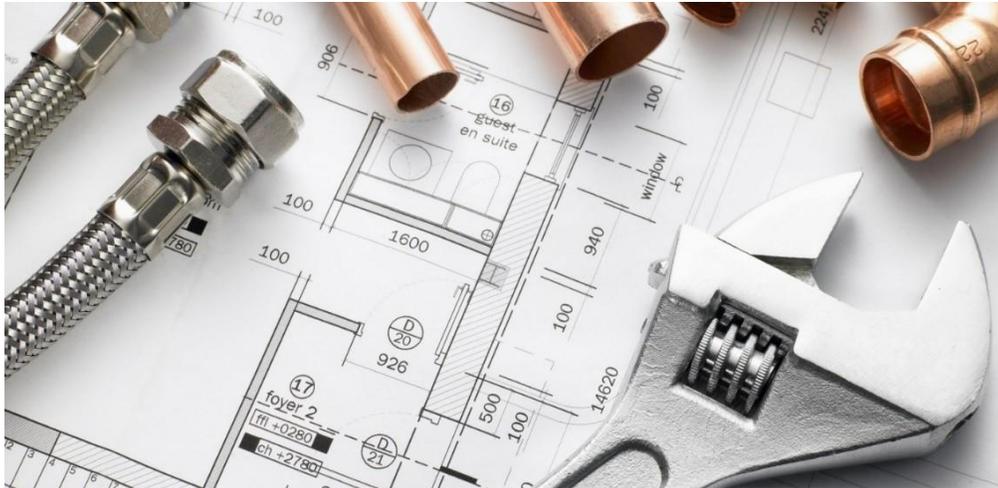


# PLUMBING

## MASTER PLAN OF INSTRUCTION

### 2021 - 2022

Mike Mayes, Instructor



#### MISSION

The mission of Fort Myers Technical College is to provide high quality career and technical training, in order to prepare students for current and emerging industries, delivered by a professional and caring staff in a positive learning environment.

The School Board of Lee County, Florida does not discriminate nor tolerate discrimination on the basis of race (including anti-Semitism), color, ethnicity, national origin, sex, sexual orientation, gender identification, gender expression, disability (physical or mental), pregnancy, marital status, age (except as authorized by law), religion, military status, socioeconomic status, linguistic preference, genetic information, ancestry, or any other reason protected under applicable federal, state, or local law in the provision of educational programs, activities or employment policies as required by Title II, Title VI, and Title VII Civil Rights Act of 1964 including, Title IX of the United States Education Amendments of 1972, Age Discrimination in Employment Act of 1967 (ADEA), Individuals with Disabilities Education Act (IDEA), Section 504 of the Rehabilitation Act of 1973, Florida Civil Rights Act of 1992, Genetic Information Nondiscrimination Act of 2008, Americans with Disabilities Act of 1990 (ADA) and the Amendment Act of 2008 (ADAAA), and the Florida Educational Equity Act of 1984. The School Board also provides equal access of its facilities to youth groups, as required by the Boy Scouts of America Equal Access Act. Any sections of the District's collectively bargained, negotiated agreements dealing with hiring, promotion, and tenure will contain a statement of nondiscrimination similar to that in the Board's statement above. As required by Florida's Educational Equity Act, the Superintendent shall submit an annual equity report addressing the District's educational and employment practices. The School Board of Lee County, Florida, prohibits retaliation by any District personnel against a person for reporting, filing or being a witness in a discrimination (including harassment) charge, complaint, investigation or lawsuit associated or in connection with this policy. Established grievance procedures and appropriate discrimination complaint forms are available from the Office of Civil Rights & Equity, Academic and Student Support Services or the Equity Coordinator at each school. Complaints/inquiries regarding compliance with these regulations may be submitted in writing to: For Employees: Office of Civil Rights & Equity Compliance at (239) 337-8134 or at [CivilRightsEquity@leeschools.net](mailto:CivilRightsEquity@leeschools.net). For Students: Office of Positive Prevention at (239) 939- 6858.

Lack of English language skills will not be a barrier to admission and participation. The District may assess each student's ability to benefit from specific programs through placement tests and counseling, and, if necessary, will provide services or referrals to better prepare students for successful participation.



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# Plumbing

## INTRODUCTION

Since 1978, the Plumbing program has been an important avenue to employment in the plumbing trade. In 2014 the program moved to a much larger lab and in 2016 the original instructor retired. These changes have strengthened and improved an already successful program that continues to evolve and grow to serve the needs of the community and local businesses.

What the Plumbing program provides is the best training in the latest materials and methods required to service and install residential and commercial plumbing systems that protect the health of the public and conserve natural resources. The active involvement of local plumbing businesses and material manufacturers keeps our training up to date so that our student's skills are always current. The FLDOE curriculum framework is the foundation of the program. Complementary training includes CPR, OSHA 10 and industry specific certifications provided by manufacturers' representatives.

## PROGRAM MISSION

The mission of the Plumbing program is to prepare students for entry level employment as a Plumbing Helper/Apprentice working under the supervision of a licensed plumbing contractor. Equal emphasis is placed on employability and technical skills. Preparing students to succeed encompasses training in technical skills, communication skills, interaction on the jobsite, personal responsibility and work ethics.

## PROGRAM PHILOSOPHY

Student success is dependent on each student's determination and commitment. Individual and group work is evaluated and students receive feedback on both technical performance and employability. This program is designed to prepare students to enter the workforce with the knowledge and confidence to succeed.

## PROGRAM CONTENT

The Plumbing program is a planned sequence of instruction consisting of four occupational completion points (OCP). The structure will allow students to complete specified portions of the program for employment or to remain for advanced training. A student who completes the applicable competencies at any occupational completion point may either continue with the training or become an occupational completer.

### **The program covers the following topics:**

- Introduction to Plumbing Profession
- Jobsite Safety
- Care & Use of Tools
- Plumbing Mathematics
- Architectural and Plumbing Drawings
- Plumbing Codes
- Drainage, Waste, and Vent Systems Installation/Repair/Maintenance
- Water Distribution System Installation/Repair/Maintenance
- Fixture Installation

- Residential & Commercial Plumbing System Repairs
- Employability Skills
- Entrepreneurship & Communication Skills

## **ESSENTIAL TRAINING TASKS**

### **Physical Requirements**

To succeed in the Plumbing trade students must be able to:

- Stand, walk, use hands or fingers, handle or feel, reach with hands and arms, stoop, kneel, crouch or crawl talk and hear.
- Lift and carry at least 75 pounds while travelling on foot or while working on a ladder.
- Students should be capable of working in and around the following conditions: outdoor weather (hot/cold/humid), very loud noise, heavy machinery, rotating mechanical parts, high precarious places, awkward and/or confining spaces, possible inhalation of fumes or airborne particles, risk of electrical shock.
- Climb and balance at least 1/3 of the work day.
- Lift and carry 25 pounds for at least 2/3 of the work day.

### **Cognitive Requirements**

- Must be able to analyze and reason to effectively troubleshoot typical plumbing situations and problems.
- Must be able to work on projects for extended periods of time performing repetitive tasks.
- Must be able to effectively manage unforeseen issues that may arise in any plumbing project or repair.
- Must be able to speak, read, understand, and write in English.

## **ACCOMMODATIONS**

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or post-secondary student's accommodations plan to meet individual needs to ensure equal access. Post-secondary students with disabilities must self-identify, present documentation, required accommodations if needed, and develop a plan with their post-secondary service provider. Accommodations received in post-secondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology, and special communication systems. Documentation of the accommodations requested and services provided are maintained in a confidential file.

## **TUITION**

Tuition is charged for adult students at a reasonable rate that may vary slightly from year to year and is due prior to the first day of each semester. Current fee information is available from Student Services. Tuition is waived for eligible high school dual-enrolled students. Failure to pay all fees due at the time class begins will result in the student not being able to attend class and/or clinical.

## **CLASS SCHEDULE**

Daytime certificated classes meet Monday through Friday from 8:00 A.M. until 2:30 P.M. This amounts to 30 hours of classroom instruction per week. Lunch breaks are 30 minutes in length.

## **ATTENDANCE POLICY**

In an effort to develop appropriate employability skills, FMTC students are expected to attend all class sessions. As is expected in the workplace, when it is necessary to be absent due to illness or emergency

situations, all students are to notify the instructor on or before the date of absence. The student attendance policy for each post-secondary program is consistent with industry standards.

Campus attendance is kept via a computerized system. It is the responsibility of the student to **log in and out** in order to receive credit for class time. This allows the school to keep accurate attendance records for the actual number of hours and minutes attended.

All adult students are expected to be in attendance at least 90% of their scheduled hours during each semester. Adult students failing to maintain the 90% attendance standard may not be permitted to continue in their program and may be required to sit out one full semester, unless administration approves to waive the 90% standard based on special circumstances.

### **Absences**

A student who is absent for 6 consecutive class sessions will be withdrawn from enrollment in his/her program. A student withdrawn for absenteeism must petition administration to return. Students exhibiting a pattern of consecutive absences less than 4 days may be subject to dismissal as determined by a School Intervention Team. School Intervention Team meetings will be held as necessary to attempt to alleviate issues resulting in excessive absences and to counsel the student of possible alternatives and consequences.

Students who are late for class, including returning late from lunch, must clock in. Students who leave school early must notify their instructor and clock out. This time out of class is recorded as time absent and is counted against the required 90% attendance. Excessive tardiness or early departures will be reported to the Student Affairs Specialist and will result in a meeting with the School Intervention Team.

Adult students who know they will be out of school for an extended period of time (4 days or longer) may apply for a Leave of Absence from their program. A Leave of Absence will be granted only once during a twelve-month period. **STUDENTS WHO EXERCISE A LEAVE OF ABSENCE MAY HAVE TO EXTEND THEIR TIME IN THEIR PROGRAM AND PAY ADDITIONAL FEES.**

### **Leaving Campus During School Hours**

Students must notify their instructor when leaving campus early. This is for the safety of students, to accurately track time, and to allow the instructor to best utilize instructional resources.

## **PLAN OF INSTRUCTIONAL PRACTICES**

### **Teaching Methods**

Classroom instruction and lectures as well as hands-on training in a plumbing shop environment are typical of the Plumbing program. Lectures will be led by the instructor and students will be expected to participate in discussions as a class and demonstrate proficiency through quizzes and tests. Students will work alone and as a team in the shop environment and around the campus on various plumbing projects. Students are encouraged to assist each other in the learning process and become independent problem-solvers as well.

### **Safety**

A basic outline of safety standards and practices is covered the first week of class along with a continuous implementation of safety principles throughout the course. Students will also have the opportunity to gain certification in NCCER Core Safety and OSHA 10.

### **Evaluation**

Student performance will be evaluated using quizzes, tests, attendance, portfolio assessments, completion of project assignments, decision-making, work habits, and achievement of entry-level competencies, and other methods.

## **Job Shadowing**

Job shadowing experiences, or volunteer experiences, are available to students as part of their program training. These experiences are designed to give the student actual hands-on experience doing a variety of related tasks. Length and type of experiences will vary. The program instructor determines appropriateness of the experience. Additional information regarding job-shadowing experiences may be obtained from the program instructor.

## **GRADING PROCEDURE**

### **Teacher Grading Procedure**

The grading policy for the Plumbing program is as follows:

- |                               |                    |
|-------------------------------|--------------------|
| 1. Shop/Lab Work              | 40% of Total Grade |
| 2. Quizzes/Exams/Written Work | 30% of Total Grade |
| 3. Attendance/Productivity    | 30% of Total Grade |

The grading scale for the program is as follows:

A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	0 – 59%

Fort Myers Technical College is a post-secondary institute designed to provide trained individuals to industry. The approved post-secondary program grading requirements must be met if the student is to receive a certificate.

### **Program Progress**

Students are required to complete the program of training within the hours allotted by the State of Florida for completion. Progress must be at a rate that will allow completion of the program with the number of membership hours stated in the Curriculum Frameworks.

Failure to progress at this rate will require the student to meet with the program instructor, a counselor, and an administrator in order to identify an appropriate completion point or to assist the student in selecting a more appropriate training program.

### **Work Habits**

Effective work habits are the cornerstone to successful employment. Students are expected to demonstrate productive work habits during all phases of enrollment. Instructors will work with students who need assistance in this area to improve the overall possibility for successful employment.

**Attendance:** Attends class, arrives/leaves on time; begins and ends work as expected.

**Character:** Displays loyalty, honesty, trustworthiness, dependability, reliability, initiative, self-discipline, and self-responsibility; displays a high level of effort and commitment to performing and completing work.

**Teamwork:** Respects the right of others; respects confidentiality; is cooperative; is assertive; displays a customer service attitude; seeks opportunities for continuous learning; demonstrates mannerly behavior; encourages and facilitates cooperation, pride, trust, and group identity; fosters commitment and team spirit.

**Appearance:** Displays appropriate dress, grooming, hygiene, and etiquette; wears full regulation uniform.

**Attitude:** Displays a willingness to cooperate and accept constructive criticism; sets realistic expectations; approaches assignments with interest.

**Productivity:** Is prepared for class by reading assignments and completing homework; contributes to class discussions; and involvement in lab activities (in other words, no sleeping or daydreaming). Follows safety practices; conserves and maintains equipment and supplies; keeps work area neat and clean; follows directions and procedures; makes up assignments and tests punctually; notifies proper authorities of situations presenting potential safety hazards; does not use or knowingly permits others to use tools and equipment improperly; stays on task and utilizes time constructively.

**Organization:** Manifests skill in prioritizing and management of time and stress; demonstrates flexibility in adapting to changes.

**Communication:** Communicates accurate information to others in a professional and courteous manner; displays appropriate nonverbal (eye contact, body language) and oral (listening, telephone etiquette, grammar) skills; asks pertinent questions; listens attentively to others, notifies instructor in advance of absences or tardiness.

### **SATISFACTORY ACADEMIC PROGRESS**

In order to receive and continue to receive financial assistance of any type, a student must maintain satisfactory academic progress. The Financial Aid Advisor will require a progress report to be completed by the student's instructor and submitted to the Financial Aid Office prior to each disbursement.

Students are considered to be making Satisfactory Academic Progress (SAP) if they successfully complete their scheduled clock hours, achieve a specific cumulative grade evaluation or grade point average (GPA), and do not exceed the maximum time limits to complete their course of study. Each Student Academic Progress will be checked at 450 clock hours and prior to subsequent disbursements for students enrolled in programs one academic year or greater. Progress will be checked at the half-way point for programs less than one academic year. No SAP is required prior to the first disbursement.

### **REQUIREMENTS FOR A CERTIFICATE**

All competencies specified in the State of Florida Curriculum Frameworks for the program must be successfully completed. Successful completion is at least an 85% average in the areas of skills, knowledge, and work habits.

Proficiency in the competency standards listed in the Master Plan of Instruction must be demonstrated.

Students must meet minimum T.A.B.E. skill requirements (or qualify for an exemption) prior to graduation.

In addition to the requirements above, the recommendation of the instructor for certification includes: consideration of employability skills, personal appearance, the willingness to learn and to work, punctuality, cooperative attitude, and appropriate work habits.

### **PLUMBING STUDENT DRESS CODE**

Students who attend FMTC shall dress in a manner appropriate for the job in which they are receiving training, including any special protective gear and professional uniforms. All clothing must be neither distracting nor offensive and be clean, neat, modest, in good repair, and appropriately sized.

Administration has the final authority for determining whether or not a student's apparel conforms to the dress code. When it is determined that it does not, students will be required to change into clothing which will conform to this code or leave campus. Students may return to campus when they have changed into appropriate clothing.

**Dress Code/Uniforms Required:** FMTC uniform khaki work shirts (tucked into pants at the waist), work pants or jeans with belt, and work shoes.

## **JOB DESCRIPTIONS**

### **OCP A            Helper, Plumber, Pipefitter (360 Hours)**

Upon completion of OCP A the student will be qualified to work as a plumber's apprentice/helper on most plumbing projects and repairs.

### **OCP B            Residential Plumber (240 Hours)**

Upon completion of OCP B the student will be qualified to work as a plumber's apprentice/helper on most plumbing projects and repairs. The student will also be qualified to work on new construction plumbing projects under the supervision of a foreman or licensed plumber.

### **OCP C            Commercial Plumber (240 Hours)**

Upon completion of OCP C the student will be qualified to perform basic plumbing repairs and install most fixtures and appliances while employed by a licensed plumbing contractor.

### **OCP D            Plumbing Applications (240 Hours)**

Upon completion of OCP D the student will be qualified to work on most residential and commercial plumbing projects and repairs while employed by a licensed plumbing contractor.

## **TEXTBOOKS**

Included in program costs by FMTC.

## **REQUIRED MATERIALS**

Notebook/Paper/Pens/Pencils/Ruler/Architect Scale/30-60 Drawing Triangle

## **PROGRAM OBJECTIVES**

See the attached Florida State Department of Education Curriculum Frameworks for program objectives and competencies.

**Florida Department of Education  
Curriculum Framework**

**Program Title:** Plumbing  
**Program Type:** Career Preparatory  
**Career Cluster:** Architecture & Construction

<b>Career Certificate Program</b>	
Program Number	C500500
CIP Number	0646050312
Grade Level	30, 31
Standard Length	1080 Hours
Teacher Certification	Refer to the <b>Program Structure</b> section.
CTSO	SkillsUSA
SOC Codes (all applicable)	47-3015 - Helpers—Pipelayers, Plumbers, Pipefitters, and Steamfitters 47-2152 - Plumbers, Pipefitters, and Steamfitters
CTE Program Resources	<a href="http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml">http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml</a>
Basic Skills Level	Mathematics: 9 Language: 9 Reading: 9

**Purpose**

The purpose of the programs in this cluster is to prepare students for employment or advanced training in a variety of pipe occupations.

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Architecture and Construction career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Architecture and Construction career cluster.

The content includes but is not limited to reading construction documents, understanding building codes in the pipe trades, plumbing pipe-cutting-and-joining skills and plumbing layout and installation.

**Additional Information** relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

### **Program Structure**

This program is a planned sequence of instruction consisting of four occupational completion points. The recommended sequence allows students to complete specified portions of the program for employment or to remain for advanced training. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or terminate as an occupational completer.

This program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3)(b), F.S.

To teach the courses listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the postsecondary program structure:

			Teacher Certification		
A	BCV0508	Helper, Plumber, Pipefitter	PLUMBIN @7 7G Bldg Const ¶ 7 ¶ G Tec Constr ¶ 7 ¶ G	360 Hours	47-3015
B	BCV0540	Residential Plumber		240 Hours	47-2152
C	BCV0562	Commercial Plumber		240 Hours	47-2152
D	BCV0596	Plumbing Applications		240 Hours	47-2152

### **Common Career Technical Core – Career Ready Practices**

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

## **Standards**

After successfully completing this program, the student will be able to perform the following:

- 01.0 Describe career and training opportunities in the pipe-trade industry.
- 02.0 Demonstrate a basic knowledge of the pipe-trade industry.
- 03.0 Identify the use and care of basic tools in the pipe-trade industry.
- 04.0 Demonstrate the importance of health, safety and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- 05.0 Demonstrate mathematics knowledge and skills.
- 06.0 Demonstrate science knowledge and skills.
- 07.0 Read and interpret construction documents.
- 08.0 Read and interpret basic pipe-trade codes.
- 09.0 Demonstrate knowledge of basic plumbing skills.
- 10.0 Cut and join pipes.
- 11.0 Demonstrate knowledge of plumbing codes.
- 12.0 Read and interpret construction documents and specifications.
- 13.0 Lay out and coordinate a job.
- 14.0 Install first rough (underground).
- 15.0 Install second rough (first floor and above).
- 16.0 Trim out plumbing.
- 17.0 Explain the importance of employability and entrepreneurship skills.
- 18.0 Install hot-water-heating and circulating-systems.
- 19.0 Install interceptors and separators.
- 20.0 Install a storm drainage system.
- 21.0 Explain the principles of backflow cross and connection control.
- 22.0 Explain the process of installing a medical gas system. (optional)
- 23.0 Explain how Liquid Propane Gas (LPG) and natural gas systems work.
- 24.0 Repair, service and maintain plumbing systems.
- 25.0 Explain how to connect residential plumbing to a municipal sewer lateral. (optional)
- 26.0 Apply plumbing applications to swimming pools and spas. (optional)
- 27.0 Identify systems and their components.
- 28.0 Adapt a system design.
- 29.0 Conduct a site assessment.
- 30.0 Maintain and troubleshoot a solar thermal system.
- 31.0 Install solar collectors.