

SAN DIEGO COMMUNITY COLLEGE DISTRICT
CONTINUING EDUCATION
COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER

MECT 421

COURSE TITLE

PLUMBING I

TYPE COURSE

NON-FEE

VOCATIONAL

CATALOG COURSE DESCRIPTION

This course provides entry-level training in plumbing occupations such as plumber's helper, pipe layer, plumbing maintenance worker and parts clerk. Instruction will cover the following areas: plumbing systems and theories, plumbing codes, plumbing tools and materials, and safety practices and procedures. Students will use equipment that includes torches, cutoff saws, pipe threaders, pipe cutting tools and assorted hand tools. (FT)

LECTURE/LABORATORY HOURS

120

ADVISORIES

Students may be required to conform to safety-related dress codes.

RECOMMENDED SKILL LEVEL

High School diploma or GED recommended. Ability to read and comprehend at the 9th grade reading level, ability to communicate effectively in the English language and knowledge of general math and basic geometry.

COURSE GOALS

ESLRs

1. SDCE students will demonstrate interpersonal skills by learning and working cooperatively in a diverse environment.
2. SDCE students will be effective communicators and listeners.
3. SDCE students will process information independently and cooperatively.

COURSE GOALS (CONTINUED)

4. SDCE students will pursue life-long learning to adapt to changing conditions and to fulfill their roles as individuals, family members, workers and community members.
5. SDCE students will demonstrate learning gains or competencies relevant to their needs and course objectives.

To provide instruction and practical application of occupational knowledge skills in the plumbing industry and to provide students with a working knowledge of the tools, materials, systems, installation methods, and codes associated with the modern plumbing trade. Integrated throughout the course are career preparation standards, which include communication, interpersonal skills, problem solving, safety, technology, and other employment skills. Students who successfully complete the program will be qualified for entry-level positions in the plumbing trade. Jobs in the field include plumber, estimator, pipe fitter and plumber apprentice.

COURSE OBJECTIVES

Students will demonstrate through practical applications, written and oral communication skills, their ability to:

1. Demonstrate knowledge of the principles of public and employer relations including appearance and conduct, communications and customer satisfaction.
2. Demonstrate the safe and proper uses of basic plumbing tools, i.e., wrenches, cutters, reamers, caulkers, measuring devices, ladders, levels and power tools.
3. Demonstrate knowledge of the terminology of major plumbing parts.
4. Demonstrate knowledge of safe work habits and practices concerning use of tools, equipment, supplies and trucks, and is able to describe types of job site hazards.
5. List basic plumbing codes and regulatory agencies.
6. Describe basic plumbing principles and requirements.
7. List waste system components.
8. Calculate needed sizes of waste and vent systems.
9. Demonstrate knowledge of the application of drainage fittings.
10. Calculate needed sizes of gas systems.
11. Demonstrate knowledge of applications of most commonly used piping materials.
12. Demonstrate knowledge of plumbing fixture types, sizes and uses.
13. Demonstrate proper soldering techniques in class and complete penetration test.
14. Demonstrate performance and attendance required within the trade.
15. Demonstrate punctuality and dependability.
16. Demonstrate positive attitude, honesty, integrity and cooperation.
17. Demonstrates knowledge of how to handle advisory relationships off the job.
18. Choose appropriate actions in response to constructive criticism.
19. Meet job standards of neatness and grooming.

COURSE OBJECTIVES (CONTINUED)

20 Meets comprehension and abilities required within the trade.

21. Demonstrates ability to follow oral and written directions.
22. Completes assigned work within the allotted time.
23. Demonstrates ability to work well with minimum supervision.
24. Demonstrates initiative by working beyond minimum requirements.
25. Job Acquisition Skills/Lifelong Learning Opportunities
26. Completes a resume and job application.
27. Demonstrates job interview techniques.
28. Describe career opportunities in the field.
29. Demonstrate the need for continuing education and learning.

SECTION II

COURSE CONTENT AND SCOPE

The following topics are included in the framework of the course but are not intended as limits on content. The order of presentation and relative emphasis will vary with each instructor.

1. Introduction to the Plumbing Trade 3 Hours
 - 1.1. History of plumbing
 - 1.2. Principles of plumbing systems
 - 1.3. Steps to becoming a journeyman
 - 1.3.1. Pride in your work
 - 1.3.2. Attitude, as it affects your work
 - 1.3.3. Getting, keeping and advancing in a job
 - 1.4. Math calculations for the Plumbing Trade
 - 1.4.1. Calculating area, diameters, fractions, division and multiplication.
 - 1.4.2. Expansion coefficients, rates of fall, pipe lengths and offsets.
2. How Plumbing Protects the Health of the Nation 3 Hours
 - 2.1. Potable water
 - 2.2. Cross connections
 - 2.3. Other health hazards
 - 2.4. How society protects itself
 - 2.5. Uniform Plumbing Code - introduction
3. Personal Safety and Job Site Practices 3 Hours
 - 3.1. Tool and equipment safety orientation
 - 3.2. Safety on the job site
 - 3.2.1. Material Safety Data Sheets, Lock-out, Tag-out
 - 3.2.2. Injury and illness prevention
 - 3.3. Principles of safety
4. Hand Tools 18 Hours
 - 4.1. Categories of hand tools
 - 4.2. Copper rough-in tools
 - 4.2.1. Copper assembly
 - 4.3. Plastic rough-in tools
 - 4.3.1. Plastic assembly

COURSE CONTENT AND SCOPE (CONTINUED)

4.4.	Cast iron rough-in tools	
4.4.1.	Cast iron assembly	
4.5.	Steel pipe rough-in tools	
4.5.1.	Steel pipe assembly	
4.6.	Miscellaneous tools	
5.	Power Tools	12 Hours
5.1.	Categories of power tools	
5.2.	Power tool safety	
6.	More Plumbing Principles	9 Hours
6.1.	More about cross connections	
6.2.	How to prime a 'P' trap	
6.3.	More on Plumbing Code	
7.	Water Sources	9 Hours
7.1.	Public water supplies	
7.1.1.	Water treatment	
7.2.	Private water supplies	
7.2.1.	Types of wells	
7.2.2.	Rules of wells	
8.	Sewage Disposal Systems	9 Hours
8.1.	Public sewage disposal	
8.1.1.	Components of the drainage system	
8.1.2.	Clean-out rules	
8.1.3.	The city sewer system	
8.1.4.	Sewage treatment	
8.2.	Private sewage disposal systems	
8.2.1.	Septic tanks systems	
9.	Gases	6 Hours
9.1.	Principles and properties of gases	
9.2.	Types of gases	
9.3.	Safety - working in enclosed spaces	
10.	Piping Materials	19 Hours
10.1.	How to select piping material	
10.2.	Uses of various piping materials	
10.3.	Manufacturing methods of these materials	
10.4.	Advantages and disadvantages of these materials	
10.5.	Applications of drainage fittings	
10.6.	Industry organizations	
10.7.	How to "read" copper fittings	
10.8.	Plastic piping- in depth	
10.9.	Steel piping- in depth	
11.	Galvanic Action	6 Hours
11.1.	Requirements	
11.2.	Results	
12.	Plumbing Fixtures	13 Hours
12.1.	All plumbing fixtures, types, and sizes	
12.2.	All facets, types and sizes	

COURSE CONTENT AND SCOPE (CONTINUED)

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| 13. Job Search Instruction | 10 Hours |
| 13.1. Selecting a job | |
| 13.2. Finding employment openings | |
| 13.3. Preparing for job interviews | |
| 13.4. Job interview techniques | |
| 13.5. Career ladders in the Plumbing Industry | |

APPROPRIATE READINGS

Reading assignments are required and may include but, are not limited to, the following: Textbooks, reference books such as Uniform Plumbing Code, Math for the Industrial Shop, Practical Problems in Mathematics, supplemental materials such as copies of company safety policies, OSHA Standards (Occupational Safety and Hazard), Material Safety Data Sheets (MSDS) and procedures and assorted blueprints.

WRITING ASSIGNMENTS

Writing assignments are required and may include, but are not limited to the following: Listing of safety rules as applied to hand and power tools, completing answers on quizzes and self-check review questions, personal resume.

OUTSIDE ASSIGNMENTS

Students are expected to spend a minimum of two hours per day outside of class in practice and preparation for each day in class. Appropriate assignments may include, but not limited to:

1. Appropriate readings
2. Preparing research projects
3. Preparing appropriate writing assignments
4. Studying as needed to perform successfully in class

APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING

Critical thinking assignments are required and may include, but are not limited to, the following: solving math calculations such as volume and area, using blueprints and drawings and selection of appropriate tools for specific jobs.

EVALUATION

A student's grade will be based on multiple measures of performance related to the course objectives. Multiple measures may include, but are not limited to, the following: mid-term and final exams, quizzes, class participation and attendance.

