



El Camino College
COURSE OUTLINE OF RECORD – Official

Course Acronym:	CTEC
Course Number:	180
Descriptive Title:	Residential Plumbing
Division:	Industry and Technology
Department:	Construction Technology
Course Disciplines:	Construction Technology
Catalog Description:	This course explores the layout and fabrication techniques needed to erect a water and waste plumbing system for a residence. Students apply appropriate methods and procedures by selecting proper size pipes, fittings, fixtures and accessories and install and test various fixtures and systems. Other topics include the diagnosing, troubleshooting and clearing of stoppages in a plumbing system.
Prerequisite:	
Co-requisite:	
Recommended Preparation:	
Enrollment Limitation:	
Hours Lecture (per week):	2.5
Hours Laboratory (per week):	5
Outside Study Hours:	5
Total Course Hours:	135
Course Units:	4
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	3/15/1999
Transfer UC:	No
Effective Date:	
General Education: ECC	
Term:	
Other:	
CSU GE:	
Term:	

Other:	
IGETC:	
Term:	
Other:	
Student Learning Outcomes:	<p>SLO #1 Plumbing Materials and Methods</p> <p>Students will be able to demonstrate a basic application of materials and methods commonly used in residential construction.</p> <p>SLO #2 Watertight Copper Joint</p> <p>Students will be able to assemble a watertight copper joint.</p> <p>SLO #3 Lavatory P-Trap</p> <p>Students will be able to assemble a P-trap under a lavatory.</p>
Course Objectives:	<ol style="list-style-type: none"> 1. Interpret plumbing manuals and code. 2. Demonstrate proper use of basic plumbing parts, materials, equipment and terminology. 3. Display an understanding of water supply and drain-waste-vent systems. 4. Prepare sketches of proper water and drainage systems. 5. Demonstrate proper methods of installing and testing of plumbing fixtures, faucets and devices. 6. Design, install and test a water distribution system, a hot water system and a sanitary system using local code standards and requirements. 7. Apply various methods of maintenance service, repair and replacement of plumbing parts. 8. Ensure plumbing code compliance for inspection. 9. Analyze, troubleshoot and clear a stoppage.
Major Topics:	<p>I. PLUMBING 180 OVERVIEW (1 hour, lecture)</p> <ol style="list-style-type: none"> A. Safety instructions B. Opportunities in the plumbing trade C. Care, handling and storage of hand and power tools <p>II. PLUMBING 180 OVERVIEW (4 hours, lab)</p> <ol style="list-style-type: none"> A. Safety instructions B. Opportunities in the plumbing trade C. Care, handling and storage of hand and power tools <p>III. PLUMBING FUNDAMENTALS (7 hours, lecture)</p> <ol style="list-style-type: none"> A. Plumbing pipes, fittings, fixtures, devices, and materials B. Basic plumbing systems: water; drain, waste and vent; fuel, and gas Uniform Plumbing Code (UPC) <p>IV. PLUMBING FUNDAMENTALS (12 hours, lab)</p> <ol style="list-style-type: none"> A. Plumbing pipes, fittings, fixtures, devices, and materials

- B. Basic plumbing systems: water; drain, waste and vent; fuel, and gas UPC

V. CONSTRUCTION OF A RESIDENTIAL PLUMBING SYSTEM (7 hours, lecture)

- A. Waste sketch system
- B. Isometric sketch showing proper installation of drain lines, traps, soil and vent stacks, indicating each fitting, nomenclature and size
- C. Water sketch
- D. Isometric sketch showing proper installation of hot and cold water connections to fixtures, indicating pipe size and connections

VI. CONSTRUCTION OF A RESIDENTIAL PLUMBING SYSTEM (17 hours, lab)

- A. Waste sketch system
- B. Isometric sketch showing proper installation of drain lines, traps, soil and vent stacks, indicating each fitting, nomenclature and size
- C. Water sketch
- D. Isometric sketch showing proper installation of hot and cold water connections to fixtures, indicating pipe size and connections

VII. ROUGH IN AND INSTALLATION OF FIXTURES (20 hours, lecture)

- A. Installation of drain, waste and vent lines to all fixtures and appliances assuring adequate support for lines
- B. Installation of hot and cold water lines to all fixtures and appliances, assuring piping systems have adequate hangers, brackets and supports
- C. Inspection of all work for compliance with UPC

VIII. ROUGH IN AND INSTALLATION OF FIXTURES (40 hours, lab)

- A. Installation of drain, waste and vent lines to all fixtures and appliances assuring adequate support for lines
- B. Installation of hot and cold water lines to all fixtures and appliances, assuring piping systems have adequate hangers, brackets and supports
- C. Inspection of all work for compliance with UPC

IX. FINISH WORK (5 hours, lecture)

- A. Installation of fixtures and appliances assuring Plumbing Code compliance for final test and inspection

X. FINISH WORK (9 hours, lab)

- A. Installation of fixtures and appliances assuring Plumbing Code compliance for final test and inspection

XI. TROUBLESHOOTING DRAINAGE SYSTEM AND SPECIAL SYSTEMS (5 hours, lecture)

- A. Supply systems
- B. Waste, drain and vent systems
- C. Special systems

	XII. TROUBLESHOOTING DRAINAGE SYSTEM AND SPECIAL SYSTEMS (8 hours, lab) A. Supply systems B. Waste, drain and vent systems C. Special systems
Total Lecture Hours:	45
Total Laboratory Hours:	90
Total Hours:	135
Primary Method of Evaluation:	3) Skills demonstration
Typical Assignment Using Primary Method of Evaluation:	Given a typical plumbing diagram, measure, cut, assemble and solder copper pipes and fittings. Test the system(s) for leaks. Report results to the instructor.
Critical Thinking Assignment 1:	Working from an isometric drawing, prepare a one-page material list for the job which includes all necessary pipes and fittings. Submit material list to the instructor.
Critical Thinking Assignment 2:	Calculate and document on a one-page lab sheet, the correct size of piping for drain-waste-vent system. Submit lab sheet to the instructor.
Other Evaluation Methods:	Class Performance, Completion, Fieldwork, Homework Problems, Laboratory Reports, Matching Items, Multiple Choice, Other Exams, Performance Exams, Quizzes, True/False
Instructional Methods:	Demonstration, Discussion, Field trips, Group Activities, Lab, Lecture, Multimedia presentations
If other:	Internet Presentation/Resources
Work Outside of Class:	Answer questions, Problem solving activity, Required reading, Skill practice, Study, Written work (such as essay/composition/report/analysis/research)
If Other:	
Up-To-Date Representative Texts:	Douglas Hansen, Redwood Kardon, Paddy Morrissey. <u>Code Check, Plumbing and Mechanical</u> . 6 th Edition. International Code Council. 2021.
Alternative Texts:	
Required Supplementary Readings:	
Other Required Materials:	Safety glasses Appropriate shoes and attire for construction work
Requisite:	
Category:	
Requisite course(s): List both prerequisites and corequisites in this box.	
Requisite and Matching skill(s): Bold the requisite skill. List	

the corresponding course objective under each skill(s).	
Requisite Skill:	
Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable	
Requisite course:	
Requisite and Matching skill(s):Bold the requisite skill. List the corresponding course objective under each skill(s).	
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Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	Eli Corbitt
Date:	09/01/1998
Original Board Approval Date:	03/15/1999
Last Reviewed and/or Revised by:	Ross Durand
Date:	02/08/2024
Last Board Approval Date:	06/17/2024
Effective Term:	FALL 2025