

COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	Residential Plumbing and Repair
COURSE NUMBER	BEMT 0115
DIVISION	Career and Technical Education
DEPARTMENT	BEMT
CIP CODE	46.0401
CREDIT HOURS	4
CONTACT HOURS/WEEK	Class: 1.5 Lab: 5
PREREQUISITES	None

COURSE DESCRIPTION

This is the basic course in residential plumbing and repair. The course topics include: Environmental sustainability, plumbing codes, waste piping, drain, waste and vent systems, toilet maintenance, garbage disposals, kitchen sinks, gas hot water tanks, electric hot water tanks, heat pump hot water tanks, gas iron pipe, corrugated stainless steel piping, commercial flush valves, compression fittings, pipe flare, soldering, PEX and press fittings, and sump pumps.

PROGRAM LEARNING OUTCOMES

Students will demonstrate an adherence to safety standards and proficiency in the installation or repair of residential electrical, plumbing, HVAC, exterior building materials, roofing, irrigation systems, landscape/hardscape, concrete placement and finish, masonry install and repair.

TEXTBOOKS

<http://kckccbookstore.com/>

METHODS OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. Introduction
- II. Plumbing Codes
 - A. City

- B. State
- C. National
- III. Waste Piping/Water Supply systems
 - A. DWV Sizes
 - B. Water Supply Types
 - C. Water Supply Repairs
 - D. Compression Fittings
 - E. DWV Types
 - 1. Iron
 - 2. Plastic
- IV. The Drain, Waste, and Vent System
 - A. Stacks
 - B. Building Drain
 - C. Traps
 - D. Vents
 - E. Re-venting
- V. Toilet Maintenance/Install
 - A. Operation of the Toilet
 - B. Continuously Running Water
 - C. Replacing Tank Valve System
 - D. Dislodging an Obstruction for the Toilet
 - E. Stopping Leaking Bowls
 - F. Installation of a new toilet
- VI. Bathroom Vanity
 - A. Vanity Top Install
 - B. Faucet Install/Repair
 - C. Drain/P-Trap Maintenance and Install
 - D. DWV Requirements
- VII. Hot Water Tanks
 - A. Maintenance/Install of Gas Hot Water Tanks
 - B. Maintenance/Install of Electric Hot Water Tanks
 - C. Maintenance/Install of Heat Pump Hot Water Tanks
- VIII. Garbage Disposal Maintenance
 - A. Drain Clogs
 - B. Blade Jams
 - C. Install Mechanical or Electrical
- IX. Installing a New Kitchen Sink
 - A. Cutout Size
 - B. Cutting the Countertop

- C. Mounting the Sink and Faucet
- D. Water Line Vertical Tubes
- E. Riser Tubes
- F. Trim Fasteners
- G. Caulking
- H. Faucet and Drain Fittings
- X. Shower/Tub Faucet
 - A. Installation of Faucets
 - B. Repair of Faucets
 - C. Cleaning/Clearing Debris on Shower Head
 - D. Cleaning/Clearing Debris in Drains
- XI. Water Fountains
 - A. Repair/Replace Fountain Bubbler
 - B. Repair/Replace push bars and solenoids
 - C. Replace Thermostat
 - D. Adjust Water Pressure Regulator
 - E. Repair/Replace P-Trap and GFCI
- XII. Commercial Urinal/Toilet Flush Valves
 - A. Repair/Replace Diaphragm
 - B. Repair/Replace Flush Handle
 - C. Repair/Replace Vacuum Break
 - D. Repair/Replace Head Socket
 - E. Repair/Replace Main Shut-off Valve
 - F. Install New Flush Valve
 - G. Install New Urinal/Toilet

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. Define and explain plumbing codes.
 1. Understand and demonstrate knowledge of national codes.
 2. Understand and perform a code check.
 3. Identify and demonstrate knowledge of state codes.
 4. Understand and demonstrate knowledge of local codes.
 5. Understand and perform inspections based on code.
 6. Identify and demonstrate how codes are used.
- B. Define and explain drain, waste, and vent system.
 7. Understand and demonstrate why stacks are necessary.
 8. Understand and perform cleanouts on traps and drains.
 9. Identify and demonstrate how to re-vent a system.

10. Understand and demonstrate how to install a stack.
 11. Understand and perform how to install a trap.
 12. Identify and demonstrate plumbing drain, waste, and vent fittings.
- C. Define and complete toilet maintenance and install.
13. Understand and demonstrate the operation of a toilet.
 14. Understand and perform a tank valve test.
 15. Identify and demonstrate how to install/repair a toilet.
 16. Understand and demonstrate how to replace shut off valve.
 17. Understand and perform a new flapper install.
 18. Identify and demonstrate proper tightening of toilet bolts.
- D. Define and complete water supply line install and repair..
19. Install and repair copper or PEX supply lines.
 20. Identify all fittings for copper or PEX.
 21. Create a schematic for all supply lines.
- E. Define and complete garbage disposal install and repair.
22. Understand and demonstrate how to clear drain clogs.
 23. Understand and perform an electricity power check on a garbage disposal.
 24. Identify and demonstrate how to un-jam blades.
 25. Understand and demonstrate how to use the re-set feature.
 26. Understand and perform a garbage disposal install repair.
 27. Identify and demonstrate knowledge of garbage disposal wiring.
- F. The student will be define and complete kitchen sink install and repair.
28. Remove and replace the sink completely.
 29. Remove and install a new faucet.
 30. Mark and cut-out countertop.
 31. Repair and create new supply risers.
 32. Repair and install p-trap and drain assembly.
 33. Seal and clean the sink after repair or install.
- G. Define and complete shower or tub install and repair
34. Install or repair faucets.
 35. Clean and clear drains and shower heads.
- H. Define and complete commercial flush valve install and repair.
36. Repair the flush handle, vacuum break, and diaphragm.
 37. Repair the head socket.
 38. Repair or replace the main shut-off valve.
 39. Install a new flush valve.
- I. Define and complete water fountain install and repair.

- 40. Repair/replace fountain bubbler.
 - 41. Repair/replace push bar and solenoids.
 - 42. Replace the thermostat.
 - 43. Adjust water pressure and regulator.
 - 44. Repair/replace p-trap and GFCI receptacle.
- J. Install and repair hot water tanks.
- 45. Install or repair a gas hot water tank.
 - 46. install or repair an electric hot water tank.
 - 47. install a heat pump hot water tank.
- K. Thread and install black iron pipe, and CSST pipe.
- 48. Cut and thread black iron pipe.
 - 49. Clean threads, and assemble black iron pipe to fittings.
 - 50. Identify different black iron pipe fittings.
 - 51. Cut and assemble CSST pipe.
 - 52. Install CSST pipe.
 - 53. Properly ground CSST and black iron pipe.
 - 54. Identify CSST pipe fittings.
- L. Install and repair a bathroom sink, commercial or residential.
- 55. Install a new vanity top.
 - 56. Install and repair a faucet.
 - 57. Install and repair a p-trap and tailpiece.
 - 58. Install and repair shut off valves.

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.

