



VIRGINIA BEACH CITY PUBLIC SCHOOLS
CHARTING THE COURSE

Department of Teaching & Learning
Parent/Student Course Information

Plumbing
(VO 8522)
Three Credits, One Year
Grades 10 - 12

Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.

COURSE DESCRIPTION

In this program students learn to safely assemble, install, and repair pipes and fittings, and are introduced to installing fixtures of heating, water and drainage systems, according to specification and plumbing codes. Students learn to use, care for and safely handle the tools, machinery, equipment and materials commonly found in the plumbing trade.

CERTIFICATION

NCCER: Core
OSHA 10

STUDENT ORGANIZATION

SkillsUSA is a co-curricular organization for all students enrolled in trade and industrial education programs. SkillsUSA is a partnership of students, teachers and industry working together to ensure America has a skilled workforce. SkillsUSA helps students excel by providing educational programs, events and competitions that support career and technical education (CTE) in the nation's classrooms. Students are highly encouraged to participate.

PREREQUISITE

Construction Technology

OPTIONS FOR NEXT COURSE

None

REQUIRED STUDENT TEXTBOOK

None

COMPETENCIES FOR PLUMBING

Demonstrating Personal Qualities and Abilities

- 1 Demonstrate creativity and innovation.
- 2 Demonstrate critical thinking and problem-solving.
- 3 Demonstrate initiative and self-direction.
- 4 Demonstrate integrity.
- 5 Demonstrate work ethic.

Demonstrating Interpersonal Skills

- 6 Demonstrate conflict-resolution skills.
- 7 Demonstrate listening and speaking skills.
- 8 Demonstrate respect for diversity.
- 9 Demonstrate customer service skills.
- 10 Collaborate with team members.

Demonstrating Professional Competencies

- 11 Demonstrate big-picture thinking.
- 12 Demonstrate career- and life-management skills.
- 13 Demonstrate continuous learning and adaptability.
- 14 Manage time and resources.
- 15 Demonstrate information-literacy skills.
- 16 Demonstrate an understanding of information security.
- 17 Maintain working knowledge of current information-technology (IT) systems.
- 18 Demonstrate proficiency with technologies, tools, and machines common to a specific occupation.
- 19 Apply mathematical skills to job-specific tasks.
- 20 Demonstrate professionalism.
- 21 Demonstrate reading and writing skills.
- 22 Demonstrate workplace safety.

Examining All Aspects of an Industry

- 23 Examine aspects of planning within an industry/organization.
- 24 Examine aspects of management within an industry/organization.
- 25 Examine aspects of financial responsibility within an industry/organization.
- 26 Examine technical and production skills required of workers within an industry/organization.
- 27 Examine principles of technology that underlie an industry/organization.
- 28 Examine labor issues related to an industry/organization.
- 29 Examine community issues related to an industry/organization.
- 30 Examine health, safety, and environmental issues related to an industry/organization.

Addressing Elements of Student Life

- 31 Identify the purposes and goals of the student organization.
- 32 Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.
- 33 Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.
- 34 Identify Internet safety issues and procedures for complying with acceptable use standards.

Exploring Work-Based Learning

- 35 Identify the types of work-based learning (WBL) opportunities.
- 36 Reflect on lessons learned during the WBL experience.
- 37 Explore career opportunities related to the WBL experience.

38 Participate in a WBL experience, when appropriate.

Applying Basic Safety Standards

39 Comply with federal, state, and local safety legal requirements.

40 Identify PPE (personal protective equipment) requirements.

41 Maintain a safe working environment.

42 Explain safe working practices around electrical hazards.

43 Identify emergency first-aid procedures.

44 Identify the types of fires and the methods used to extinguish them.

45 Inspect course-specific hand and power tools to visually identify defects.

46 Demonstrate lifting and carrying techniques.

47 Demonstrate safe laddering techniques.

48 Demonstrate safe scaffolding techniques.

49 Report personal injuries and environmental and equipment safety violations to the appropriate authority.

50 Earn the Construction Industry OSHA 10 card.

51 Pass a safety exam for lab/site safety and the use of tools and equipment specific to the construction industry.

Focusing on the Plumbing Profession

52 Discuss the historical development of the plumbing trade.

53 Describe the importance of plumbers in modern society.

54 Explain the importance of code compliance to the profession.

55 Discuss the role of teams in a plumbing trade.

56 Develop a list of tools and safety equipment to be carried in work vehicle.

57 Describe chemical risks associated with the plumbing occupation.

58 Identify plumbing-related career and educational opportunities.

59 Identify how green technology is incorporated into plumbing.

Applying Basic Mathematics to the Plumbing Profession

60 Measure pipe dimensions.

61 Calculate fitting allowance.

62 Calculate offsets using the Pythagorean Theorem.

63 Calculate a 45-degree offset using the constant method.

64 Perform mathematical calculations using feet and inches as the unit of measure, including addition, subtraction, and conversion (feet to inches, inches to feet).

65 Convert decimals to fractions and fractions to decimals.

66 Convert metric measurements to standard measurements.

Reading Drawings for the Plumbing Profession

67 Identify fixtures depicted on a blueprint.

68 Read an architect's scale.

69 Develop an overhead and an isometric drawing.

70 Develop fitting/material lists based on drawings.

71 Interpret the schedule on a blueprint.

72 Interpret specifications on a blueprint.

73 Describe how code requirements apply to certain drawings.

Working with Plastic Pipe and Fittings

74 Identify the types of plastic pipe.

75 Identify the material properties, storage, and handling requirements of plastic pipe.

76 Identify the types of fittings and valves used with plastic pipe.

77 Identify the techniques used in hanging and supporting plastic pipe.

- 78 Join plastic pipe.
- 79 Identify the hazards and safety precautions associated with plastic pipe.

Working with Copper Tube and Fittings

- 80 Identify types of copper tube.
- 81 Identify the material properties, storage, and handling requirements of copper tube.
- 82 Identify the types of fittings and valves used with copper tube.
- 83 Identify the techniques used in hanging and supporting copper tube.
- 84 Join copper tube.
- 85 Identify the hazards and safety precautions associated with copper tube.

Working with Cast-Iron Pipe and Fittings

- 86 Identify types of cast-iron pipe.
- 87 Identify the material properties, storage, and handling requirements of cast-iron pipe.
- 88 Identify the types of fittings and valves used with cast-iron pipe.
- 89 Identify the techniques used in hanging and supporting cast-iron pipe.
- 90 Join cast-iron pipe.
- 91 Identify the hazards and safety precautions associated with cast-iron pipe.

Working with Steel Pipe and Fittings

- 92 Identify types of steel pipe.
- 93 Identify the material properties, storage, and handling requirements of steel pipe.
- 94 Identify the types of fittings and valves used with steel pipe.
- 95 Identify the techniques used in hanging and supporting steel pipe.
- 96 Join steel pipe.
- 97 Identify the hazards and safety precautions associated with steel pipe.

Performing Pipe Cutting and Joining

- 98 Cut and deburr copper tubing.
- 99 Operate torches commonly used in the plumbing trade.
- 100 Construct a copper tubing assembly using solder joints.
- 101 Install press fittings.

Installing Drainage, Waste, and Vent (DWV) Systems

- 102 Identify the steps of roughing-in a DWV (drainage, waste, and vent) assembly of PVC/ABS, for the following: water closet, lavatory, bathtub, shower, kitchen or bar sink, washing machine, bidet, urinal, indirect waste.
- 103 Explain how waste moves from a fixture through the drain system to the environment.
- 104 Identify the major components of a drainage system and their functions.
- 105 Identify types of traps and their components.
- 106 Identify significant code and health issues, violations, and consequences related to DWV systems.

Exploring Rough-in of Water Distribution Components

- 107 Describe the installation of a water distribution system of hard drawn copper, CPVC, and PEX.
- 108 Describe air- and water-pressure tests.

Introducing Plumbing Fixtures

- 109 Identify the basic types of materials used in the manufacture of plumbing fixtures.
- 110 Identify common types of sinks, lavatories, and faucets.
- 111 Identify common bathtubs and showers.
- 112 Identify common toilets, urinals, and bidets.
- 113 Identify common drinking fountains and water coolers.
- 114 Identify common types of appliances connected by a plumber.

Aaron C. Spence, Ed.D., Superintendent
Virginia Beach City Public Schools
2512 George Mason Drive, Virginia Beach, VA 23456-0038

Produced by the Department of Teaching and Learning.
For further information, please call (757) 263-1070.

Notice of Non-Discrimination Policy

Virginia Beach City Public Schools does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation/gender identity, pregnancy, childbirth or related medical condition, disability, marital status, age, genetic information or veteran status in its programs, activities, employment, or enrollment, and provides equal access to the Boy Scouts and other designated youth groups. School Board policies and regulations (including, but not limited to, Policies 2-33, 4-4, 5-7, 5-19, 5-20, 5-44, 6-33, 6-7, 7-48, 7-49, 7-57 and Regulations 4-4.1, 4-4.2, 5-44.1, 7-11.1, 7-17.1 and 7-57.1) provide equal access to courses, programs, enrollment, counseling services, physical education and athletic, vocational education, instructional materials, extracurricular activities and employment.

Title IX Notice: Complaints or concerns regarding discrimination on the basis of sex or sexual harassment should be addressed to the Title IX Coordinator, at the VBCPS Office of Student Leadership, 641 Carriage Hill Road, Suite 200, Virginia Beach, 23452, (757) 263-2020, Mary.Dees@vbschools.com (student complaints) or the VBCPS Department of School Leadership, 2512 George Mason Drive, Municipal Center, Building 6, Virginia Beach, Virginia, 23456 (757) 263-1088, Elizabeth.Bryant@vbschools.com (employee complaints). Additional information regarding Virginia Beach City Public Schools' policies regarding discrimination on the basis of sex and sexual harassment, as well as the procedures for filing a formal complaint and related grievance processes, can be found in School Board Policy 5-44 and School Board Regulations 5-44.1 (students), School Board Policy 4-4 and School Board Regulation 4-4.3 (employees), and on the School Division's website at [Diversity, Equity and Inclusion/Title IX](#). Concerns about the application of [Section 504 of the Rehabilitation Act](#) should be addressed to the Section 504 Coordinator/Executive Director of Student Support Services at (757) 263-1980, 2512 George Mason Drive, Virginia Beach, Virginia, 23456 or the Section 504 Coordinator at the student's school. For students who are eligible or suspected of being eligible for special education or related services under IDEA, please contact the Office of Programs for Exceptional Children at (757) 263-2400, Plaza Annex/Family and Community Engagement Center, 641 Carriage Hill Road, Suite 200, Virginia Beach, VA 23452.

The School Division is committed to providing educational environments that are free of discrimination, harassment, and bullying. Students, staff, parents/guardians who have concerns about discrimination, harassment, or bullying should contact the school administration at their school. Promptly reporting concerns will allow the school to take appropriate actions to investigate and resolve issues. School Board Policy 5-7 addresses non-discrimination and anti-harassment, Policy 5-44 addresses sexual harassment and discrimination based on sex or gender. Policy 5-36 and its supporting regulations address other forms of harassment.

Alternative formats of this publication which may include taped, Braille, or large print materials are available upon request for individuals with disabilities. Call or write The Department of Teaching and Learning, Virginia Beach City Public Schools, 2512 George Mason Drive, P.O. Box 6038, Virginia Beach, VA 23456-0038. Telephone 263-1070 (voice); fax 263-1424; 263-1240 (TDD) or email at Brandon.Martin@vbschools.com.

vbschools.com
your virtual link to Hampton Roads' largest school system



No part of this publication may be produced or shared in any form without giving specific credit to Virginia Beach City Public Schools.

August 2021