



VIRGINIA BEACH CITY PUBLIC SCHOOLS
CHARTING THE COURSE

Department of Teaching & Learning
Parent/Student Course Information

Electricity
(VO8534)
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

This program covers safety, wiring, terminology, electrical floor plan layouts and the National Electric Code. Students are instructed in the installation of all power and lighting circuits, including 200-amp service and the materials used in new construction or remodeling. They gain practical experience troubleshooting electrical problems and reading blueprints.

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 ELECTRICITY

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 Construction Safety Standards (Core Safety)

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

40 Maintain a safe working environment.

41 Explain safe working practices around electrical hazards.

42 Identify emergency first aid procedures.

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

44 Identify PPE (personal protective equipment) requirements.

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 Demonstrate lockout/tagout procedures.

50 Report injuries.

51 Report personal, environmental, and equipment safety violations to the appropriate authority.

52 Earn the OSHA 10 card.

53 Pass safety exam.

Focusing on the Electrician's Profession

54 Explain electrician-specific safety issues.

55 Discuss current topics in the industry.

56 Explore the various occupations available in electricity and related fields.

57 Investigate career opportunities in the electrical industry.

58 Discuss all postsecondary training and licensing in the electricity field.

59 Describe the employee's role in ensuring the success of the electrical business.

60 Identify national and local trade organizations.

Using Tools and Materials

61 Utilize the various types of hand tools used by electricians.

62 Utilize the various types of power tools used by electricians.

63 Identify commonly used materials by name and by regional variance of terminology.

64 Prepare a material inventory.

Applying Basic Electrical Theory

65 Explain basic electrical theory.

66 Explain the relationship of electron theory to circuit design by the use of Ohm's Law.

67 Use a variety of meters to take readings.

68 Calculate series circuits.

69 Wire a series circuit.

70 Calculate parallel circuits.

71 Wire parallel circuits.

Solving Mathematical Problems Related to the Electrical Field

72 Solve word problems involving whole numbers, fractions, and decimals.

73 Solve algebraic formulas pertaining to electrical applications.

74 Solve problems involving percentage, ratio, and proportion.

75 Measure distances using scales and measuring devices.

Interpreting Prints and Specifications

76 Draw electrical circuits.

77 Read electrical construction drawings and specifications.

Navigating the NEC Book

- 78 Explain the intent of the NEC.
- 79 Interpret the NEC requirements for electrical installation.

Selecting and Installing Conductors

- 80 Identify various types of conductors and their associated applications.
- 81 Install conductors.
- 82 Terminate conductors with lugs, connectors, or terminals.

Identifying Panelboards and Switchboards

- 83 Identify purpose and location of overcurrent protective devices (OCPDs) and service entrance equipment.

Describing Generators and Power Supplies

- 84 Explain principles of generating electricity.
- 85 Explain principles of magnetism/electromagnetism.
- 86 Apply principles of generating electricity.
- 87 Identify components of a typical stand-alone generator.

Exploring Environmentally Friendly Choices

- 88 Identify energy-efficient equipment and methods.
- 89 Explore the environmental impacts of land use and site location for a proposed building project.
- 90 Explore design choices for a proposed building project that reflect conservation and efficient use of materials.
- 91 Explore design choices for a proposed building project that reflect conservation and efficient use of energy.
- 92 Explore design choices for a proposed building project that reflect conservation and efficient use of water.
- 93 Explore design choices that can affect indoor air quality for proposed building projects

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.

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August 2021