



Department of Teaching & Learning
Parent/Student Course Information

Telecommunications I
(AT8680)
Three Credits, One Year
Grades 9 - 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

While participating in this course of study, students may begin preparation for careers with corporations such as Cox Communications, Verizon, Nortel or Direct TV. Students learn to install telephone, television, surround sound, security systems, closed-circuit television and internet connections. Students work in a lab setting and install current technology.

CERTIFICATION

Residential Satellite Technician
Certified Fiber Optics Installer (FOI)
Data Cabling Installer (DCIC)

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

None

OPTIONS FOR NEXT COURSE

Telecommunications II

REQUIRED STUDENT TEXTBOOK

None

COMPETENCIES FOR TELECOMMUNICATIONS I

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.

Practicing Safety

- 39 Demonstrate special safety procedures required for outside equipment.
- 40 Demonstrate compliance with OSHA requirements for telecommunications (Standard 1910.268).
- 41 List safety procedures for operating a service truck.
- 42 Document procedures for eye and skin safety.
- 43 Describe electrostatic discharge.

Understanding AC/DC Fundamentals

- 44 Apply safe working practices around AC and DC circuits.
- 45 Demonstrate proper use of electronics tools and equipment.
- 46 Analyze series and parallel DC circuit characteristics.
- 47 Examine different types of circuit control devices.
- 48 Examine the use of capacitors and inductors in DC circuits.
- 49 Analyze alternating voltage and current.
- 50 Examine the use of capacitors and inductors in AC circuits.
- 51 Analyze electrical power.
- 52 Assemble circuits on printed circuit boards.
- 53 Analyze semiconductor properties, devices, and integrated circuits.
- 54 Analyze amplifier circuits used in various electronics products.
- 55 Examine basic logic gates, logic truth tables, and digital signals.
- 56 Analyze the function of a basic telephone set.

Integrating Computer Skills

- 57 Explain how software and hybrid hardware/software solutions may provide alternative solutions to problems.
- 58 Explain worldwide numbering systems.
- 59 Explain computer telephony integration.
- 60 Demonstrate proficiency with standard office software.
- 61 Draw a basic building wiring plan, using a CADD program.
- 62 Describe Internet and network topologies and technologies.
- 63 Explain the different levels of the OSI and TCP/IP models.
- 64 Demonstrate skills in file system navigation, accessing manuals, and editing files in various operating systems.
- 65 Research computer and Internet security problems.

Exploring Analog Telephony and Transmission Service Providers

- 66 Outline the history of the telephone.
- 67 Demonstrate the basics of a wired voice system.
- 68 Define POTS, DID, OPX, tie-lines, and WATS lines.
- 69 Explain the function of a PBX.
- 70 Construct local loops of phone companies.
- 71 Describe the functions of the central exchange.
- 72 Differentiate among dedicated lines, metered, and switched services.

- 73 Compare broadband DSL and ISDN.
- 74 Explain the purposes of local exchange carriers (LECs).
- 75 Explore the history of telephone companies.
- 76 Explain the difference between LECs and ROCs (regional operating companies).
- 77 Define independent telephone company.
- 78 Explain network operations centers (NOCs).
- 79 Define the terms In-band and Common Channel Signaling (CCS) and Signaling System 7 (SS7).
- 80 Describe a network control point (NCP).
- 81 Explain the importance of digital subscriber lines.
- 82 Explore digital solutions to telephony (VoIP and cellular services).

Applying Mathematics

- 83 Apply mathematics skills using electronics formulas.
- 84 Demonstrate proficiency with the use of scientific calculators.
- 85 Describe and use the electrical color code.
- 86 Produce a repair estimate.
- 87 Explain costs of doing business in a repair or installation firm or department, using a profit and loss statement.

Local Competencies

- 88 Familiarize students with the various techniques used to perform electrical troubleshooting.
- 89 Provide students with a comprehensive introduction to data cabling.
- 90 Explore the basics of data communication.
- 91 Review cabling specifications and standards.
- 92 Explore the basics of network architectures.
- 93 Practice cable construction.
- 94 Explore cable performance characteristics.
- 95 Review National Electric Code Requirements - NEC & UL Requirements.
- 96 Explore telecommunications and cabling system structure.
- 97 Explain, demonstrate and identify data cabling installation tools.
- 98 Explore transmission media for networking and communications.
- 99 Explain, demonstrate and identify telecommunications outlets and connectors.
- 100 Explore local area networks.
- 101 Explore wireless heterogeneous cabling networks.
- 102 Explore cabling system components.
- 103 Explore cabling system design.
- 104 Install communications cabling.
- 105 Install connector cabling.
- 106 Review cabling testing and certification materials.
- 107 Establish a baseline for testing and repairing a cabling system.
- 108 Review the importance of cabling documentation.

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

Notice of Non-Discrimination Policy

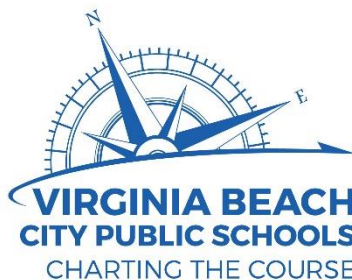
Virginia Beach City Public Schools does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation/gender identity, pregnancy, childbirth or related medical condition, disability, marital status, age, genetic information or veteran status in its programs, activities, 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