



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 Workplace Readiness Skills: Personal Qualities and People Skills

- 1 Demonstrate positive work ethic.
- 2 Demonstrate integrity.
- 3 Demonstrate teamwork skills.
- 4 Demonstrate self-representation skills.
- 5 Demonstrate diversity awareness.
- 6 Demonstrate conflict-resolution skills.
- 7 Demonstrate creativity and resourcefulness.

Demonstrating Workplace Readiness Skills: Professional Knowledge and Skills

- 8 Demonstrate effective speaking and listening skills.
- 9 Demonstrate effective reading and writing skills.
- 10 Demonstrate critical-thinking and problem-solving skills.
- 11 Demonstrate healthy behaviors and safety skills.
- 12 Demonstrate an understanding of workplace organizations, systems and climates.
- 13 Demonstrate lifelong-learning skills.
- 14 Demonstrate job-acquisition and advancement skills.
- 15 Demonstrate time-, task- and resource-management skills.
- 16 Demonstrate job-specific mathematics skills.
- 17 Demonstrate customer-service skills.

Demonstrating Workplace Readiness Skills: Technology Knowledge and Skills

- 18 Demonstrate proficiency with technologies common to a specific occupation.
- 19 Demonstrate information technology skills.
- 20 Demonstrate an understanding of Internet use and security issues.
- 21 Demonstrate telecommunications skills.

Examining All Aspects of an Industry

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

Addressing Elements of Student Life

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

Practicing Safety

- 34 Demonstrate special safety procedures required for outside equipment.
- 35 Demonstrate compliance with OSHA requirements for telecommunications (Standard 1910.268).
- 36 List safety procedures for operating a service truck.

- 37 Document procedures for eye and skin safety.
- 38 Describe electrostatic discharge.

Understanding AC/DC Fundamentals

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

Integrating Computer Skills

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

Exploring Analog Telephony and Transmission Service Providers

- 61 Outline the history of the telephone.
- 62 Demonstrate the basics of a wired voice system.
- 63 Define POTS, DID, OPX, tie-lines and WATS lines.
- 64 Explain the function of a PBX.
- 65 Construct local loops of phone companies.
- 66 Describe the functions of the central exchange.
- 67 Differentiate among dedicated lines, metered and switched services.
- 68 Compare broadband DSL and ISDN.
- 69 Explain the purposes of local exchange carriers (LECs).
- 70 Explore the history of telephone companies.
- 71 Explain the difference between LECs and ROCs (regional operating companies).
- 72 Define independent telephone company.
- 73 Explain network operations centers (NOCs).
- 74 Define the terms In-band and Common Channel Signaling (CCS) and Signaling System 7 (SS7).
- 75 Describe a network control point (NCP).
- 76 Explain the importance of digital subscriber lines.
- 77 Explore digital solutions to telephony (VoIP and cellular services).

Applying Mathematics

- 78 Apply mathematics skills using electronics formulas.
- 79 Demonstrate proficiency with the use of scientific calculators.
- 80 Describe and use the electrical color code.
- 81 Produce a repair estimate.
- 82 Explain costs of doing business in a repair or installation firm or department, using a profit and loss statement.

Local Competencies

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

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

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To seek resolution of grievances resulting from alleged discrimination or to report violations of these policies, please contact the Title VI/Title IX Coordinator/Director of Student Leadership at (757) 263-2020, 1413 Laskin Road, Virginia Beach, Virginia, 23451 (for student complaints) or the Section 504/ADA Coordinator/Chief Human Resources Officer at (757) 263-1133, 2512 George Mason Drive, Municipal Center, Building 6, Virginia Beach, Virginia, 23456 (for employees or other citizens). 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, Laskin Road Annex, 1413 Laskin Road, Virginia Beach, Virginia, 23451.

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CHARTING THE COURSE

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(Revised August 2018)