Network Administration & Cyber Security I  
(BE 6655)  
One Credit, One Year  
Grades 11 - 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
Cyber threats and hackers present some of the biggest threats to our national security, businesses and organizations. Our society depends on computers and the Internet to function, and as such, the risk of cybercrimes increases as well. In this program, students will take a comprehensive approach to the needs of protecting our computer systems. Students will learn how to configure, manage and secure networks along with protecting servers, desktops and mobile devices. Ethical hacking labs will allow students to learn how to defend against threats and conduct penetration testing measures on networks. Students will work with Windows and Linux operating systems and during the course of the two-year program will have opportunities to become certified in nationally recognized certifications from CompTIA, Microsoft and EC-Council.

CERTIFICATION
Students will prepare for the CompTIA Network + and the Microsoft Technology Associate (MTA).

STUDENT ORGANIZATION
The Future Business Leaders of America (FBLA) is the co-curricular organization for secondary Business and Information Technology students. The organization enhances occupational preparation for students by helping them attain the following goals: leadership skills; knowledge of the American enterprise system; self-confidence; improvement of home, business, and community; scholarship; citizenship; and career goals.

PREREQUISITE
Keyboarding course(s) or teacher-approved demonstration and documentation of touch keyboarding skills and Information Technology Fundamentals 6670.

OPTIONS FOR NEXT COURSE
Network Administration & Cyber Security II

REQUIRED STUDENT TEXTBOOK
None
COMPETENCIES FOR NETWORK ADMINISTRATION & CYBER SECURITY I

**Demonstrating Workplace Readiness Skills: Personal Qualities and People Skills**

001 Demonstrate positive work ethic.
002 Demonstrate integrity.
003 Demonstrate teamwork skills.
004 Demonstrate self-representation skills.
005 Demonstrate diversity awareness.
006 Demonstrate conflict-resolution skills.
007 Demonstrate creativity and resourcefulness.

**Demonstrating Workplace Readiness Skills: Professional Knowledge and Skills**

008 Demonstrate effective speaking and listening skills.
009 Demonstrate effective reading and writing skills.
010 Demonstrate critical-thinking and problem-solving skills.
011 Demonstrate healthy behaviors and safety skills.
012 Demonstrate an understanding of workplace organizations, systems and climates.
013 Demonstrate lifelong-learning skills.
014 Demonstrate job-acquisition and advancement skills.
015 Demonstrate time-, task- and resource-management skills.
016 Demonstrate job-specific mathematics skills.
017 Demonstrate customer-service skills.

**Demonstrating Workplace Readiness Skills: Technology Knowledge and Skills**

018 Demonstrate proficiency with technologies common to a specific occupation.
019 Demonstrate information technology skills.
020 Demonstrate an understanding of Internet use and security issues.
021 Demonstrate telecommunications skills.

**Examining All Aspects of an Industry**

022 Examine aspects of planning within an industry/organization.
023 Examine aspects of management within an industry/organization.
024 Examine aspects of financial responsibility within an industry/organization.
025 Examine technical and production skills required of workers within an industry/organization.
026 Examine principles of technology that underlie an industry/organization.
027 Examine labor issues related to an industry/organization.
028 Examine community issues related to an industry/organization.
029 Examine health, safety and environmental issues related to an industry/organization.

**Addressing Elements of Student Life**

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

**Introducing Basic Desktop Systems Concepts**

034 Explain current desktop operating systems.
035 Explain the hardware found in a computer.
036 Navigate a desktop operating system environment.
037 Navigate system administration tools.
038 Demonstrate the procedures for installing, replacing or repairing a desktop operating system.
039 Demonstrate the procedures for installing and removing software in a desktop environment.
040 Manage a file system structure.
041 Explain different file system formats.

Introducing Basic Server Systems Concepts
042 Explain current server operating systems.
043 Explain the uses of current and emerging server and storage hardware.
044 Describe client-server architecture, including virtual server architecture.
045 Identify the services commonly found on a network server.
046 Explain the authentication of users in a network environment.

Introducing Network Design Essentials
047 Define types of networks.
048 Define types of network architecture.
049 Differentiate between distributed and centralized computing (e.g., desktop, network server, virtual server, cloud networking).
050 Identify services delivered by a server.
051 Describe standard network LAN topologies.
052 Describe variations of standard topologies (e.g., extended star, mesh, star bus, star ring).
053 Describe the role of the Network Interface Card (NIC) network adapter.
054 Describe various types of network adapters.
055 Describe the functions of networking hardware (e.g., adapter, hub, router, switch, bridge, access point).
056 Describe the primary features of each major access method.

Exploring Networking Media
057 Define terms related to wired and wireless network media.
058 Identify the types and uses of wired network media.
059 Identify the types and uses of wireless network media.
060 Describe the concept of broadband and its various incarnations (e.g., digital subscriber line [DSL], cable, fiber optics, high-speed wireless).
061 Describe the types of modems.

Understanding Networking Standards and Models
062 Describe each layer of the Open System Interconnection (OSI) model.
063 Describe devices in a network environment and their place in the OSI model.
064 Define the basic components of a network packet.
065 Describe networking protocols.
066 Map network processes that use protocols to the appropriate OSI layers.
067 Identify components and features of the Institute of Electrical and Electronics Engineers (IEEE) 802 networking specifications.

Installing Network Operating System and Services
068 Compare essential network operating system components.
069 Determine whether to use peer-to-peer or directory services.
070 Identify major decisions associated with the installation of a network operating system.
071 Select server services.
072 Install a server operating system.
Performing Network Administration Functions
073 Define different types of accounts.
074 Administer user and group accounts.
075 Create user profiles.
076 Implement global, domain and local account policies.
077 Describe considerations and procedures for sharing applications on the network.
078 Manage disk resources.
079 Identify the procedures for installing and managing a shared printer.
080 Identify the functions, features and guidelines of e-mail and calendaring.

Performing Network Management and Security Functions
081 Document a network security plan.
082 Implement a network security plan.
083 Explain the characteristics, functions and benefits of software and hardware firewalls.
084 Develop a plan to avoid data loss.
085 Back up files and directories.
086 Restore files and directories.
087 Develop a network performance monitoring plan.
088 Monitor server resources to track usage and disk space.
089 Troubleshoot user access problems.
090 Develop a preventive maintenance plan.
091 Develop an audit policy.
092 Set up file, directory and printer auditing.
093 Describe the various forms of malware protection for servers.

Providing Basic User Training and Support
094 Identify training needs.
095 Provide an orientation to a network system.
096 Develop a training plan.
097 Provide training to users.
098 Create a user manual.
099 Provide ongoing basic user support.

Performing Legal and Ethical Functions
100 Identify copyright and licensing laws that apply to computer use and network administration.
101 Describe procedures to ensure the proper licensing of a client-server operating system and applications.
102 Identify ethical behavior that is expected of users and administrators.

Preparing for Industry Certification
103 Describe the process of and requirements for obtaining industry certifications related to the Computer Network Software Operations course.
104 Identify test-taking skills and strategies to employ when taking a certification examination.
105 Demonstrate the ability to successfully complete practice examinations (e.g., practice questions similar to those on certification exams).
106 Successfully complete an industry certification examination representative of skills learned in this course (e.g., MCP, IC3, NOCTI).

Developing Employability Skills
107 Research careers in networking.
108 Compose a résumé for electronic processing.
Assemble a professional portfolio that contains representative samples of student work.

Create a cover letter to accompany a résumé.

Complete manual and electronic application forms.

Participate in an internship program.

Use electronic sources to research a company in preparation for a job interview.

Participate in a mock interview.

Compose an interview follow-up letter.

Identify the steps to follow when resigning from a position.

Identify potential employment barriers for nontraditional groups and ways to overcome these barriers.
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 and activities 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, 6-7, 6-33, 7-48, 7-49, 7-57 and Regulations 2-33.1, 4-4.1, 4-4.2, 4-4.3, 4-6.1, 5-44.1, 7-11.1, 7-17.1 and 7-57.1) provide equal access to courses, programs, counseling services, physical education and athletic, vocational education, instructional materials and extracurricular activities.

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.

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 Theresa.Dougherty@vbschools.com.

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