Department of Teaching & Learning
Parent/Student Course Information

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.

109	Assemble a professional portfolio that contains representative samples of student work.
110	Create a cover letter to accompany a résumé.
111	Complete manual and electronic application forms.
112	Participate in an internship program.
113	Use electronic sources to research a company in preparation for a job interview.
114	Participate in a mock interview.
115	Compose an interview follow-up letter.
116	Identify the steps to follow when resigning from a position.
117	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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VIRGINIA BEACH CITY PUBLIC SCHOOLS
CHARTING THE COURSE

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