



*Department of Teaching & Learning*  
*Parent/Student Course Information*

***Network Administration & Cyber Security II***  
***(BE 6656)***  
***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**

Network Administration & Cyber Security I

**OPTIONS FOR NEXT COURSE**

None

**REQUIRED STUDENT TEXTBOOK**

None

## COMPETENCIES FOR NETWORK ADMINISTRATION & CYBER SECURITY II

### **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.

### **Using Desktop Systems Concepts**

- 034 Compare current desktop operating systems.
- 035 Navigate the desktop operating system environment, using system utilities, system administrative tools, file structure tools, and hardware management tools.

036 Demonstrate the procedures followed when installing desktop operating systems.

### **Using Server Systems Concepts**

037 Compare current server operating systems.

038 Analyze the uses of current and emerging specialized server hardware, including Redundant Array of Independent Disks (RAID), blades, Symmetric Multiprocessing (SMP), storage devices (e.g., Serial Advanced Technology Attachment [SATA], ultra Small Computer Systems Interface [SCSI], fiber channel), and hot-swappable technologies.

039 Manage partitions and volumes.

040 Install applications (e.g., e-mail) and services (e.g., file sharing, printing) commonly found in a client-server environment.

### **Configuring Network Servers**

041 Implement directory services on a network.

042 Manage file replication.

043 Describe the structure and architecture of the Domain Name System (DNS).

044 Install the Domain Name System (DNS).

045 Explain how a Dynamic Host Configuration Protocol (DHCP) client obtains an Internet Protocol (IP) address from a DHCP server.

046 Install a Dynamic Host Configuration Protocol (DHCP).

047 Manage fault-tolerant volumes, using Redundant Array of Independent Disks (RAID).

048 Explain roaming and local profiles.

049 Implement directory replication.

050 Troubleshoot directory replication.

051 Implement Internet Printing Protocol (IPP) services.

### **Configuring Network Security**

052 Explain types of server malware protection, including antivirus software; spam, adware and spyware filtering; and patch management.

053 Implement Web-based and server services security features.

054 Describe the Secure Sockets Layer (SSL).

055 Install a certificate.

056 Describe software firewalls and hardware firewalls.

057 Install a firewall.

058 Implement user security policies.

### **Performing Network Administration Functions**

059 Plan accounts.

060 Administer user and group accounts.

061 Create user profiles.

062 Design the implementation of global, domain, and local account policies.

063 Use considerations for sharing applications on the network.

064 Manage disk resources.

065 Demonstrate the installation and management of a shared printer.

066 Explain e-mail and collaborative scheduling systems.

067 Implement global, domain and local system policies.

068 Describe the process of logging on to a domain account and changing a password.

069 Implement disk quotas.

070 Explain concepts related to logon authentication.

071 Identify levels of encryption.

## **Maintaining Servers**

- 072 Describe remote administration.
- 073 Identify the resources available to solve common support issues.
- 074 Describe service packs and patches.
- 075 Review event logs.
- 076 Review security and all system logs.
- 077 Describe the utilities that monitor a server's performance.
- 078 Describe the backup/restore process for directory services.

## **Conducting TCP/IP Activities**

- 079 Describe Transmission Control Protocol/Internet Protocol (TCP/IP).
- 080 Compare static and dynamic IP routing.
- 081 Configure TCP/IP.
- 082 Test a TCP/IP configuration, using operating-system-specific commands.
- 083 Identify the network and host IDs' TCP/IP addresses.
- 084 Compare IPv4 and IPv6.
- 085 Explain the function of a subnet mask and Classless Inter-Domain Routing (CIDR) format.
- 086 Describe a loopback address.
- 087 Describe the services provided by NetBIOS over TCP/IP.
- 088 Explain the process of host name resolution (i.e., the process of mapping a host name to an IP address on local and remote networks).
- 089 Modify the hosts file to resolve host names.
- 090 Configure File Transfer Protocol (FTP).
- 091 Explain the purpose of the Simple Network Management Protocol (SNMP).
- 092 Describe the implementation of Virtual LAN (VLAN).

## **Implementing and Managing Web Servers**

- 093 Describe the key protocols of Web servers.
- 094 Install Web-based services (e.g., Apache, Windows IIS).
- 095 Configure Web-based services.
- 096 Explain the major architectural components of Web-based services.
- 097 Establish Web-based services.
- 098 Add virtual servers and directories.
- 099 Install a server-side programming language that supports dynamic content.
- 100 Access a Web page with dynamic content.

## **Ensuring Network Security**

- 101 Monitor network traffic.
- 102 Analyze network systems for security vulnerabilities.
- 103 Explain the core security principles used in network management.
- 104 Analyze threats and risks to networks.
- 105 Analyze internal and external threats to computer networks.
- 106 Identify sustainable computer networking practices.
- 107 Install a virtualized operating system.

## **Providing User Training and Support**

- 108 Identify user and network administrator training needs.
- 109 Provide orientation about a network system.
- 110 Develop a training plan.
- 111 Provide training to users.
- 112 Create a user manual.

- 113 Provide ongoing user support.
- 114 Track hardware and software usage problems.

### **Performing Legal and Ethical Functions**

- 115 Identify copyright and licensing laws that apply to computer use and network administration.
- 116 Describe procedures to ensure the proper licensing of a client-server operating system and applications.
- 117 Identify ethical behavior.

### **Preparing for Industry Certification**

- 118 Describe the process and requirements for obtaining industry certifications related to the Computer Network Software Operations, Advanced course.
- 119 Identify testing skills and strategies to employ when taking a certification examination.
- 120 Demonstrate ability to successfully complete selected practice examinations (e.g., practice questions similar to those on certification exams).
- 121 Successfully complete an industry certification examination representative of skills learned in this course (e.g., MCP, IC3, NOCTI).

### **Developing Employability Skills**

- 122 Update résumé.
- 123 Update a professional portfolio that contains representative samples of student work.
- 124 Identify potential employment barriers for nontraditional groups and ways to overcome these barriers.

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For further information please call (757) 263-1070.

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