

PASSAIC COUNTY TECHNICAL INSTITUTE
45 Reinhardt Rd.
Wayne, NJ

Information Technology & Network Security I
(ITNS I)
Course # 2130
Credits 12.5
Developed 2018

I. Course Description

ITNS I is a full year study designed as a course to prepare the student for TestOut's PC Pro certification—a comprehensive, real-world study consisting of all concepts of hardware/peripherals, basic networking, security, operating system (Windows, Mac OS, Linux) installation, maintenance, and troubleshooting, and mobile technologies. Moreover, students will learn how to spec PCs based on customer needs. Acquiring the PC Pro certification will qualify and allow students, should they choose, to pursue CompTIA's A+ certification.

Students will complete the course with a full understanding of information technology and its many realms, thereby allowing them to eventually branch out to a specific area of study.

II. Curriculum Unit Planner

Unit 1

Content Area:	Informational Technology & Network Security I	Grade(s)	9
Unit Plan Title:	Unit 1 – Information Technology Essentials <i>Unit 1 will introduce the essential concepts of Information Technology including hardware, software, peripherals, and operating systems.</i> I. Intro to IT (2 days) a. Describing Information Technology (IT) b. Areas within IT c. Careers in IT II. Hardware Basics (5 days)		

- a. External components of the computer
- b. Common ports and connectors found on modern computers
- c. Internal components
- III. Software (5 days)
 - a. Office software (Word, Excel, PowerPoint)
 - b. E-mail
 - c. Basic programming (Python)
 - d. Software development
 - e. Cloud Computing
- IV. Operating Systems (4 days)
 - a. Windows basics
 - b. Linux basics
 - c. Mac OS basics
- V. Peripherals (3 days)
 - a. USB, Firewire, and Thunderbolt
 - b. Display devices
 - c. Printers

NJSLS/CCTC Standard(s) Addressed

- CRP2. Apply appropriate academic and technical skills.
- CRP10. Plan education and career paths aligned to personal goals.
- CRP11. Use technology to enhance productivity.
- 9.3. IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices.
- 9.3. IT.12 Demonstrate knowledge of the hardware components associated with information systems.
- 9.3. IT-PRG.1 Analyze customer software needs and requirements.
- 9.3. IT-PRG.6 Program a computer application using the appropriate programming language.

Essential Questions (3-5)

1. What is Information Technology?
2. What are the main components of the computer?
3. What are the components and functions of an operating system?
4. What are the various types of peripherals that can be connected to a computer?
5. What types of careers are available in the world of Information Technology?

Anchor Text(s)

Using Information Technology 11e: A Practical Introduction to Computers & Communication – Sawyer, and Williams-McGraw Hill 2014. ISBN-10: 0073516880

Mike Meyer's Guide to Managing and Troubleshooting PCs, 5th Edition – McGraw Hill 2016. ISBN 220.../1259643441

Short & Informational Texts (3-5)

ARTICLES

“What is the Future of Information Technology?”

<https://www.forbes.com/sites/quora/2017/12/15/what-is-the-future-of-information-technology/#2a504e9d49d0>

“Why Everyone Should Have to Learn Computer Programming”

<http://theconversation.com/why-everyone-should-have-to-learn-computer-programming-62328>

“The Future of Windows-as-a-Service”

<https://www.computerworld.com/article/3253120/microsoft-windows/the-future-of-windows-as-a-service.html>

Expected Proficiencies/Career and Life Skills

- Demonstrate how a computer works
- Identify the components of a modern computer
- Navigate the Windows interface
- Navigate the Mac OS interface
- Navigate the Linux interface
- Perform basic coding in Python
- Compose a proper e-mail
- Demonstrate how to perform basic tasks using Microsoft Office
- Demonstrate how to select a display device
- Convert binary to decimal

- Determine future trends in technology

Formative & Summative Assessments

- TestOut Module quizzes (Formative)
- TestOut lab simulations (Formative)
- Section assignments/activities (Formative)
- Module review packets (Summative)
- Comprehensive module tests (Summative)
- Practical scenario assessments (Real world labs) (Summative)
- Trimester projects (Summative)
- Trimester exam (Summative)

Resources (Websites, LMS, Google Classroom, documents, etc.)

- Testout's LabSim (Modules 1, 4, and 7)
- Canvas LMS
- Microsoft PowerPoint
- Microsoft Word
- Instructional Videos
- Wikis
- Infographics (www.piktochart.com)
- Review Game websites (i.e. www.classtools.net)
- Google Drive/Docs/Slides
- Career search engines (i.e. Careerbuilder, Indeed)
- Knowledgebase
- Technical forums
- Microsoft Visio
- YouTube videos

Suggested Time Frame:

3 Weeks

Unit 2

Content Area:	Informational Technology & Network Security I	Grade(s)	9
Unit Plan Title:	Unit 2 – Safety and Professionalism <i>Unit 2 will cover the importance of safety in the workplace as well as the necessary skills required for becoming a professional service technician. The student will also delve into the importance of digital citizenship.</i> I. Protection and Safety (7 days) a. Personal safety measures and safety hazards b. Electrostatic discharge (ESD) and how to protect against it c. Environmental concerns d. The PC toolkit e. PC maintenance f. Battery backup solutions II. Professionalism (4 days) a. Employment protocols b. Communicating effectively c. Digital citizenship III. Troubleshooting Overview (2 days) a. The systematic approach		
NJSLS/CCTC Standard(s) Addressed			
CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP4. Communicate clearly and effectively and with reason. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.			

- 9.3. IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships.
- 9.3. IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors.
- 9.3. IT-SUP.1 Provide technology support to maintain service.
- 9.3. IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software, and configuration problems.
- 9.3. IT-SUP.6 Evaluate the effectiveness of an information system.

Essential Questions (3-5)

1. How can environmental conditions affect computer systems?
2. What are some examples of effective communication?
3. What are the tools most commonly used by a computer service technician?
4. What are the steps for properly troubleshooting a computer problem?
5. What is digital citizenship?

Anchor Text(s)

Using Information Technology 11e: A Practical Introduction to Computers & Communication – Sawyer, and Williams-McGraw Hill 2014.

Mike Meyer's Guide to Managing and Troubleshooting PCs, 5th Edition – McGraw Hill 2016

Short & Informational Texts (3-5)

ARTICLES

“Digital Citizenship is more important than ever.”

<https://www.iste.org/explore/articleDetail?articleid=535>

“How to Select an Uninterruptible Power Supply (UPS) for Your Computer.”

<https://www.howtogeek.com/161479/how-to-select-a-battery-backup-for-your-computer/>

“Troubleshooting with the Scientific Method.”

http://www.inetdaemon.com/tutorials/troubleshooting/scientific_method.shtml

Expected Proficiencies/Career and Life Skills

- Demonstrate how to communicate effectively and clearly
- Demonstrate professionalism in the workplace.
- Demonstrate safety measures in the workplace.
- Identify the purpose for an MSDS.
- Identify the steps for properly handling sensitive materials

- Troubleshoot a basic computer problem
- Install a backup power solution
- Identify all of the common tools in a PC toolkit
- Demonstrate proper cyber ethics
- Recognize the environmental impacts on computer systems

Formative & Summative Assessments

- TestOut Module quizzes (Formative)
- TestOut lab simulations (Formative)
- Section assignments/activities (Formative)
- Module review packets (Summative)
- Comprehensive module tests (Summative)
- Practical scenario assessments (Real world labs) (Summative)
- Trimester projects (Summative)
- Trimester exam (Summative)

Resources (Websites, LMS, Google Classroom, documents, etc.)

- Testout's LabSim (Module 2)
- Canvas LMS
- Microsoft PowerPoint
- Microsoft Word
- Instructional Videos
- Wikis
- Infographics (www.piktochart.com)
- Review Game websites (i.e. www.classtools.net)
- Google Drive/Docs/Slides
- Knowledgebase
- Technical forums
- Microsoft Visio
- YouTube videos

Suggested Time Frame:

2 Weeks

Unit 3

Content Area:	Informational Technology & Network Security I	Grade(s)	9
Unit Plan Title:	Unit 3 – System Components and Implementation <i>Unit 3 will delve further into the individual components of the computer and how they work both independently and together. The unit will also cover troubleshooting each device. Students will also learn how to build a computer from the ground up, install Windows, and perform post-installation tasks.</i> I. System Components (20 days) a. Differentiating among various cases and form factors b. Power supplies i. Power supply requirements ii. Basics of electricity iii. Installing and testing a power supply iv. Troubleshooting power supplies c. Motherboards i. Selecting a motherboard based on needs/requirements ii. Installing a motherboard iii. Identifying the components on the motherboard iv. Troubleshooting motherboards d. CPUs i. Selecting a CPU based on needs/requirements ii. Identifying CPU characteristics iii. Troubleshooting CPUs e. Memory i. Memory characteristics ii. Identifying memory by sight		

- iii. Installing memory
- iv. Troubleshooting memory
- f. BIOS/UEFI
 - i. The purpose of the BIOS/UEFI system
 - ii. The boot process
 - iii. Configuring settings in the BIOS/UEFI
 - iv. Upgrading the BIOS/UEFI
- g. Storage Devices
 - i. SATA drives and their characteristics
 - ii. SSD versus legacy hard drives
 - iii. Optical media
 - iv. RAID arrays
- h. Expansion Cards
 - i. Identifying different expansion buses
 - ii. Selecting and installing an expansion card
- i. Video
 - i. Video card characteristics
 - ii. Selecting and installing a video card
- j. Audio
 - i. Audio card characteristics
 - ii. Selecting and installing an audio card
- k. Cooling systems
 - i. Properly cooling the internal components (air flow)
 - ii. Custom CPU coolers

II. Building the computer system (10 days)

- a. Researching a selecting components
- b. Building the system on the bench
- c. Building the system in the case

III. Installing Windows (5 days)

- a. Pre-Installation tasks
- b. Installing Windows 7
- c. Installing Windows 10
- d. Post-installation tasks

IV. Devices & Drivers (5 days)

- a. Installing and managing device drivers in Windows
- b. Troubleshooting device driver issues in Windows
- c. Managing devices in Linux

NJSLS/CCTC Standard(s) Addressed

CRP2. Apply appropriate academic and technical skills.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP11. Use technology to enhance productivity.

9.3. IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service.

9.3. IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices.

9.3. IT.12 Demonstrate knowledge of the hardware components associated with information systems.

9.3. IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.

9.3. IT-SUP.1 Provide technology support to maintain service.

9.3. IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.

9.3. IT-SUP.4 Perform installation, configuration and maintenance of operating systems.

9.3. IT-SUP.6 Evaluate the effectiveness of an information system.

9.3. IT-SUP.7 Employ system installation and maintenance skills to setup and maintain an information system.

9.3. IT-SUP.9 Employ technical writing and documentation skills in support of an information system.

9.3. IT-SUP.10 Apply quality assurance processes to maximize information system operation.

Essential Questions (3-5)

1. What are the main components of a motherboard?
2. How do all of the system components participate in system performance?
3. What are some things to consider before installing Windows?
4. What are some things to consider when researching components for a system?

Anchor Text(s)

Using Information Technology 11e: A Practical Introduction to Computers & Communication – Sawyer, and Williams-McGraw Hill 2014. ISBN-10: 0073516880

Mike Meyer's Guide to Managing and Troubleshooting PCs, 5th Edition – McGraw Hill 2016. ISBN 220.../1259643441

Short & Informational Texts (3-5)

ARTICLES

“How to Build a Gaming PC 2018—Step by Step Guide to Choosing Your Hardware”

<https://newbcomputerbuild.com/newb-computer-build/how-to-build-a-gaming-pc-step-by-step-guide/>

“This is Why the World Moved Onto UEFI from BIOS”

<http://www.onlinecmag.com/bios-past-uefi-future/>

“Start fresh with a clean installation of Windows 10”

<https://www.microsoft.com/en-us/software-download/windows10startfresh>

Expected Proficiencies/Career and Life Skills

- Demonstrate how each system component works independently as well as together
- Make configuration changes in the BIOS/UEFI
- Update the BIOS/UEFI (Flashing)
- Demonstrate how to properly test AC and DC power
- Build a computer system from start to finish
- Troubleshoot component problems
- Perform Windows pre-installation tasks
- Install Windows 7 and Windows 10
- Perform post-installation tasks
- Install and manage device drivers

Formative & Summative Assessments

- TestOut Module quizzes (Formative)
- TestOut lab simulations (Formative)
- Section assignments/activities (Formative)
- Module review packets (Summative)
- Comprehensive module tests (Summative)
- Practical scenario assessments (Real world labs) (Summative)
- Trimester projects (Summative)

- Trimester exam (Summative)

Resources (Websites, LMS, Google Classroom, documents, etc.)

- Testout’s LabSim (Modules 3, 5, and 10)
- Canvas LMS
- Microsoft PowerPoint
- Microsoft Word
- Instructional Videos
- Wikis
- Infographics (www.piktochart.com)
- Review Game websites (i.e. www.classtools.net)
- Google Drive/Docs/Slides
- Knowledgebase
- Technical forums
- Microsoft Visio
- YouTube videos

Suggested Time Frame:

6-7 Weeks

Unit 4

Content Area:	Informational Technology & Network Security I	Grade(s)	9
Unit Plan Title:	<p>Unit 4 – Operating System Management</p> <p><i>Unit 4 will cover all of the skills required to configure, update, and maintain an operating system and its features. In this unit, the student will work with Windows 10, Mac OS, and Linux. They will also use the Command-Line Interface (CLI) to manage files and folders.</i></p> <p>I. System Management (25 days)</p> <p> a. Windows System Tools</p> <p> i. Working with Control Panel</p>		

- ii. Managing applications with Task Manager
 - iii. Configuring the Registry
 - iv. System Configuration and DirectX
 - v. System Commands
 - vi. Performance Monitoring
- b. Preferences and Settings
 - i. Personalizing Windows
 - ii. Configuring Region and Language
- c. Configuring Video
 - i. Updating video drivers
 - ii. Optimizing video settings
 - iii. Configuring display settings
 - iv. Troubleshooting video problems
- d. Users and Groups
 - i. Managing local users and groups
 - ii. Managing online authentication accounts
 - iii. Managing User Account Control (UAC) settings
- e. Remote Services
- f. Managing Applications
 - i. Windows application management
 - ii. Linux application management
 - iii. Digital content management
- g. System Updates, Backup, and Recovery
- h. System Protection
 - i. Configuring virtual memory
 - ii. Configuring restore points
- i. Troubleshooting
 - i. Troubleshooting Windows applications and services
 - ii. Troubleshooting system lockups
 - iii. Troubleshooting Windows boot errors
 - iv. Performance Monitoring

II. Managing Storage (6 days)

- a. Partitions, volumes, and file systems

- b. Creating volumes and formatting drives
 - c. Adding space to existing volumes
 - d. Implementing storage spaces
 - e. Optimizing disk performance
 - f. Troubleshooting storage issues
- III. Managing Files and Folders (10 days)
- a. File locations
 - b. Managing files in Windows
 - i. File structure (file name, extensions, attributes)
 - ii. File associations
 - c. Managing directories using the Command Line Interface (CLI)
 - d. Configuring NTFS permissions
 - e. Sharing and securing folders
 - f. Managing files in Linux
 - i. Viewing file contents
 - ii. Managing ownership and permissions

NJSLS/CCTC Standard(s) Addressed

- CRP2. Apply appropriate academic and technical skills.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP11. Use technology to enhance productivity.
- 9.3. IT.7 Perform standard computer backup and restore procedures to protect IT information.
- 9.3. IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.
- 9.3. IT-SUP.1 Provide technology support to maintain service.
- 9.3. IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.
- 9.3. IT-SUP.4 Perform installation, configuration and maintenance of operating systems.
- 9.3. IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.
- 9.3. IT-SUP.9 Employ technical writing and documentation skills in support of an information system.
- 9.3. IT-SUP.10 Apply quality assurance processes to maximize information system operation.

Essential Questions (3-5)

1. What is the purpose of the Control Panel?
2. What is the procedure used for backup and restore of a Windows system?
3. What is the importance in knowing how to effectively use the Command-Line interface (CLI)?
4. How is Disk Management used to effectively create and manage volumes?
5. How are NTFS permissions used to secure files and folders?

Anchor Text(s)

Using Information Technology 11e: A Practical Introduction to Computers & Communication – Sawyer, and Williams-McGraw Hill 2014. ISBN-10: 0073516880

Mike Meyer's Guide to Managing and Troubleshooting PCs, 5th Edition – McGraw Hill 2016. ISBN 220.../1259643441

Short & Informational Texts (3-5)

ARTICLES

“Five benefits of command line tools”

<https://www.techrepublic.com/blog/linux-and-open-source/five-benefits-of-command-line-tools/>

“What Are Some of the Benefits of Remote IT Services?”

<http://www.channelfutures.com/rmm/what-are-some-benefits-remote-it-services>

“Mega-Guide: 10 Ways to Customize Windows 10”

<https://www.computershopper.com/windows-10/mega-guide-10-ways-to-customize-windows-10>

Expected Proficiencies/Career and Life Skills

- Make changes to Windows using Control Panel
- Use basic system commands to manage a Windows system
- Navigate the Windows Registry
- Personalize Windows
- Create and manage users and groups
- Configure remote services
- Manage applications in Windows
- Manage applications in Linux
- Understand how software licensing and Digital Rights Management (DRM) work

- Backup and restore a Windows system
- Configure updates for a Windows system
- Troubleshoot Windows boot errors
- Configure virtual memory
- Create and manage storage volumes
- Use the Command Line Interface (CLI) to manage files and folders
- Configure NTFS permissions
- Share and secure files and folders
- Manage files in Linux
- Configure dual monitors
- Optimize video settings
- Troubleshoot video problems

Formative & Summative Assessments

- TestOut Module quizzes (Formative)
- TestOut lab simulations (Formative)
- Section assignments/activities (Formative)
- Module review packets (Summative)
- Comprehensive module tests (Summative)
- Practical scenario assessments (Real world labs) (Summative)
- Trimester projects (Summative)
- Trimester exam (Summative)

Resources (Websites, LMS, Google Classroom, documents, etc.)

- Testout's LabSim (Modules 4, 5, 9 and 11)
- Canvas LMS
- Microsoft PowerPoint
- Microsoft Word
- Instructional Videos

- Google Drive/Docs/Slides
- Wikis
- Infographics (www.piktochart.com)
- Review Game websites (i.e. www.classtools.net)
- Knowledgebase
- Technical forums
- Microsoft Visio
- YouTube videos

Suggested Time Frame: 6-7 Weeks

Unit 5

Content Area:	Informational Technology & Network Security I	Grade(s)	9
Unit Plan Title:	<p>Unit 5 – Networking and Mobile Devices</p> <p><i>Unit 5 will cover the basics of wired and wireless networking. Students will get an introduction to the networking world that will help them in their second year. Mobile devices and solutions will also be covered.</i></p> <p>I. Networking (12 days)</p> <ol style="list-style-type: none"> a. What is a Network? (3 T's—Types, Terms, and Topologies) b. Network hardware <ol style="list-style-type: none"> i. Physical infrastructure (hubs, switches, etc.) ii. Network adapters c. Networking media <ol style="list-style-type: none"> i. Coaxial ii. Twisted Pair iii. Fiber optic d. Ethernet standards and practices 		

- e. IP addressing
 - i. Structure of an IP address
 - ii. Subnet masks and default gateway
 - iii. IP configuration
 - iv. IPv6
 - f. Wireless networking
 - i. Installing and configuring a wireless adapter
 - ii. Configuring wireless profiles
 - iii. Connecting to a wireless network
 - iv. Wireless security
 - v. Infrared, Bluetooth, and NFC devices
 - g. Internet connectivity
 - i. The various Internet services
 - ii. Configuring Internet connections
 - iii. Designing a small office/home office (SOHO) network
 - iv. Using HomeGroup
 - h. Network utilities (ping, tracert, nslookup)
 - i. Troubleshooting networks
- II. Mobile Devices (8 days)
- a. Notebook computers
 - i. Components of notebook computers
 - ii. Replacing notebook components (hard drive, RAM, LCD, motherboard)
 - iii. Managing power
 - iv. Troubleshooting notebooks
 - b. Mobile technologies (iOS and Android)
 - c. Mobile device networking
 - i. Synchronizing data
 - ii. Configuring e-mail
 - iii. Securing the mobile device
 - d. Troubleshooting mobile devices

NJSLS/CCTC Standard(s) Addressed

CRP2. Apply appropriate academic and technical skills.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
CRP11. Use technology to enhance productivity.
9.3. IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices.
9.3. IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.
9.3. IT-SUP.1 Provide technology support to maintain service.
9.3. IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.
9.3. IT-SUP.5 Demonstrate the use of networking concepts to develop a network.
9.3. IT-NET.1 Analyze customer or organizational network system needs and requirements.
9.3. IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).
9.3. IT-NET.3 Design a network system using technologies, tools and standards.
9.3. IT-NET.4 Perform network system installation and configuration.
9.3. IT-NET.5 Perform network administration, monitoring and support to maintain a network system.

Essential Questions (3-5)

1. What is a network?
2. What are the major factors that affect wired network communication?
3. What are the steps for installing a small office/home office (SOHO) network?
4. What are the steps for creating a wireless infrastructure?
5. How have mobile device technologies evolved over the years?

Anchor Text(s)

Using Information Technology 11e: A Practical Introduction to Computers & Communication – Sawyer, and Williams-McGraw Hill 2014. ISBN-10: 0073516880

Mike Meyer's Guide to Managing and Troubleshooting PCs, 5th Edition – McGraw Hill 2016. ISBN 220.../1259643441

Short & Informational Texts (3-5)

ARTICLES

“An Introduction to the OSI Model”

<https://www.techopedia.com/2/27094/networks/an-introduction-to-the-osi-model>

“LAN WAN PAN MAN: Learn the Differences Between These Network Types”

<https://www.techopedia.com/2/29090/networks/lanwanman-an-overview-of-network-types>

“Google’s future plans for Android might be truly exciting”

<http://bgr.com/2017/02/16/google-andromeda-fuchsia-android/>

“How To Make Alexa the Center of Your Smart Home”

<https://www.lifewire.com/make-alex-run-your-smart-home-4129663>

Expected Proficiencies/Career and Life Skills

- Demonstrate how a basic network works
- Select and install a network adapter
- Differentiate among network media and the methods in which they transmit data
- Demonstrate what is required for a network to be compliant with Ethernet standards
- Configure IP address information for a host
- Install and configure a wireless adapter
- Configure a wireless profile
- Configure a Cable Internet connection
- Configure a DSL Internet connection
- Configure a wireless infrastructure
- Use network utilities to troubleshoot a network
- Troubleshoot network connectivity issues
- Remove and replace notebook components
- Manage power settings for notebooks
- Synchronize data for mobile devices
- Configure E-mail on a mobile device
- Secure a mobile device

Formative & Summative Assessments

- TestOut Module quizzes (Formative)
- TestOut lab simulations (Formative)
- Section assignments/activities (Formative)
- Module review packets (Summative)
- Comprehensive module tests (Summative)
- Practical scenario assessments (Real world labs) (Summative)

- Trimester projects (Summative)
- Trimester exam (Summative)

Resources (Websites, LMS, Google Classroom, documents, etc.)

- TestOut’s LabSim (Modules 6 & 8)
- Canvas LMS
- Cisco Packet Tracer
- Microsoft PowerPoint
- Microsoft Word
- Instructional Videos
- Wikis
- Infographics (www.piktochart.com)
- Review Game websites (i.e. www.classtools.net)
- Google Drive/Docs/Slides
- Knowledgebase
- Technical forums
- Microsoft Visio
- YouTube videos

Suggested Time Frame: 3 Weeks

Unit 6

Content Area:	Informational Technology & Network Security I	Grade(s)	9
Unit Plan Title:	<p>Unit 6 – Security</p> <p><i>Unit 6 will cover the various security threats that users and devices face and how to protect against those threats.</i></p> <p>I. Security (16 days)</p>		

- a. Best Practices
 - i. Security policies
 - ii. Workstation security
- b. Incident Response
- c. Physical security
- d. Social engineering
- e. BIOS/UEFI security
- f. Malware
- g. Authentication
- h. File Encryption
- i. Network security
 - i. Firewalls
 - ii. Proxy servers
 - iii. VPNs

NJSLS/CCTC Standard(s) Addressed

CRP1. Act as a responsible and contributing citizen and employee.
 CRP2. Apply appropriate academic and technical skills.
 CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
 CRP11. Use technology to enhance productivity.
 9.3. IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices.
 9.3. IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors.
 9.3. IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements.
 9.3. IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches.
 9.3. IT-SUP.1 Provide technology support to maintain service.
 9.3. IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.
 9.3. IT-SUP.5 Demonstrate the use of networking concepts to develop a network.

Essential Questions (3-5)

1. What is the Principle of Least Privilege?
2. What are the various types of malware?
3. How is social engineering dangerous to an organization or individual?
4. What are the key points of an incident response?
5. What are some methods to protect a network from security threats?

Anchor Text(s)

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Mike Meyer's Guide to Managing and Troubleshooting PCs, 5th Edition – McGraw Hill 2016. ISBN 220.../1259643441

Short & Informational Texts (3-5)

ARTICLES

“The Biggest Cybersecurity Disasters of 2017 So Far”

<https://www.wired.com/story/2017-biggest-hacks-so-far/>

“Social Engineering Attacks: Common Techniques & How to Prevent an Attack”

<https://digitalguardian.com/blog/social-engineering-attacks-common-techniques-how-prevent-attack>

“Why Digital Forensics In Incident Response Matters More Now”

<https://www.darkreading.com/attacks-breaches/why-digital-forensics-in-incident-response-matters-more-now/a/d-id/1318254?>

Expected Proficiencies/Career and Life Skills

- Implement best practices for security
- Demonstrate how organizational security policies and Acceptable Use Policies (AUP) protect an organization
- Perform basic forensic procedures
- Implement effective physical security measures
- Protect against social engineering threats
- Configure BIOS/UEFI security
- Protect against malware threats
- Configuring password policies on Windows accounts
- Encrypt files and folders

- Configure the Windows firewall
- Configure a proxy server
- Configure a VPN

Formative & Summative Assessments

- TestOut Module quizzes (Formative)
- TestOut lab simulations (Formative)
- Section assignments/activities (Formative)
- Module review packets (Summative)
- Comprehensive module tests (Summative)
- Practical scenario assessments (Real world labs) (Summative)
- Trimester projects (Summative)
- Trimester exam (Summative)

Resources (Websites, LMS, Google Classroom, documents, etc.)

- TestOut's LabSim (Module 12)
- Canvas LMS
- Google Drive/Docs/Slides
- Microsoft PowerPoint
- Microsoft Word
- Instructional Videos
- Wikis
- Infographics (www.piktochart.com)
- Review Game websites (i.e. www.classtools.net)
- Knowledgebase
- Technical forums
- Microsoft Visio
- YouTube videos

Suggested Time Frame:

2-3 Weeks

Unit 7

Content Area:	Informational Technology & Network Security I	Grade(s)	9
Unit Plan Title:	Unit 7 – Capstone and Certification <i>Unit 7 will utilize capstone lab simulations and hands-on assessments to prepare the student for the certification exam.</i> I. Capstone exercises (All lab simulations using TestOut’s LabSim) <ul style="list-style-type: none">a. Build a Computer from Scratchb. Troubleshoot a malfunctioning computerc. Troubleshoot system startup errorsd. Create a home office networke. Configure Windowsf. Troubleshoot a mobile deviceg. Configure Linux II. Certification – PC Pro exam <ul style="list-style-type: none">a. Practice examsb. Certification 15 days are required.		
NJSLS/CCTC Standard(s) Addressed			
CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP4. Communicate clearly and effectively and with reason. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP10. Plan education and career paths aligned to personal goals.			

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

9.3. IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service.

9.3. IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices.

9.3. IT.7 Perform standard computer backup and restore procedures to protect IT information.

9.3. IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements.

9.3. IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches.

9.3. IT.12 Demonstrate knowledge of the hardware components associated with information systems.

9.3. IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.

9.3. IT-SUP.1 Provide technology support to maintain service.

9.3. IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software, and configuration problems.

9.3. IT-SUP.4 Perform installation, configuration and maintenance of operating systems.

9.3. IT-SUP.5 Demonstrate the use of networking concepts to develop a network.

9.3. IT-SUP.6 Evaluate the effectiveness of an information system.

9.3. IT-SUP.7 Employ system installation and maintenance skills to setup and maintain an information system.

9.3. IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.

9.3. IT-SUP.9 Employ technical writing and documentation skills in support of an information system.

9.3. IT-SUP.10 Apply quality assurance processes to maximize information system operation.

9.3. IT-NET.1 Analyze customer or organizational network system needs and requirements.

9.3. IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).

9.3. IT-NET.3 Design a network system using technologies, tools and standards.

9.3. IT-NET.4 Perform network system installation and configuration.

9.3. IT-NET.5 Perform network administration, monitoring and support to maintain a network system.

Essential Questions (3-5)

1. What are the steps required for properly preparing for certification?
2. What are the steps for troubleshooting a common PC problem?
3. What are the steps for creating a small office/home office network?
4. How do you build a computer from scratch?

Anchor Text(s)

Using Information Technology 11e: A Practical Introduction to Computers & Communication – Sawyer, and Williams-McGraw Hill
2014. ISBN-10: 0073516880

Mike Meyer's Guide to Managing and Troubleshooting PCs, 5th Edition – McGraw Hill 2016. ISBN 220.../1259643441

Short & Informational Texts (3-5)

SOFTWARE

- TestOut's LabSim Module 13 Capstone Exercises
- TestOut's LabSim PC Pro practice exams
- TestOut's LabSim PC Pro demonstrations for review

Expected Proficiencies/Career and Life Skills

- Implement best practices for security
- Configure BIOS/UEFI
- Configuring password policies on Windows accounts
- Encrypt files and folders
- Configure the Windows firewall
- Build a computer from scratch
- Perform basic and advanced configurations in Windows
- Perform basic configurations in Linux
- Configure mobile devices
- Create and manage storage spaces
- Troubleshoot PC problems
- Configure system protection
- Configure backups and restore points

Formative & Summative Assessments

- TestOut's LabSim capstone lab simulations (Formative)
- PC Pro certification exam (Summative)

Resources (Websites, LMS, Google Classroom, documents, etc.)

- TestOut's LabSim (Module 13)
- Canvas LMS
- Google Drive/Docs/Slides
- Microsoft PowerPoint
- Lab simulations

Suggested Time Frame:

2-3 Weeks

III. Instructional Strategies:

- Lecture
- Instructional videos (YouTube, TestOut's LabSim)
- Instructional demos (LabSim)
- Lab simulations (LabSim)
- Class discussions
- Slide shows and other visual data
- Strategy games to enhance critical thinking
- Collaborative hands-on projects
- Researching information
- Technical writing
- Debating
- Role-playing scenarios
- Answering questions
- Extrapolating data
- Differentiated instruction
 - Students will be placed into lab groups based on a pre-assessment. Each group will be a mix of students with some/little experience to students with more experience.
 - At times, students will collaborate to solve real-world scenarios. Each student will bring his/her own strength to the group and assist others who are not as strong in a particular area. This balance will help them solve real-world problems in the IT world.

- Through lectures, hands-on scenarios, simulations, video demos, and SMART Board interactions, the students will be exposed to a variety of teaching methods that appeal to auditory, visual, and kinesthetic learners.

IV. Methods of Student Evaluation:

Assessment in a vocational area can be divided into four general categories—formal (graded), informal (ungraded), certification, and practical application.

Formal Assessments:

- Module quizzes
- Do-Now quizzes
- Section assignments or activities
- Lab Reports
- Oral presentations
- Lab simulations
- Tests

Some of the informal assessments include, but are not limited to:

- Daily closure discussion – At the end of each day, the instructor and students discuss the day's topic and provide insight and ask questions
- Canvas Collaborations – Students are always working in groups. At the end of lab time, students are to exchange information, project data, lab reports, et al with their group members via Canvas or Google.

Certification (Summative, counts as Exam grade) – The ultimate goal at the end of the year is to acquire certification. ITNS 1 students will be taking the PC Pro certification provided by TestOut Corporation. It qualifies the student to pursue CompTIA's A+ certification, the current de facto industry standard certification.

Practical application is the most important component to any vocational area. It demonstrates that a student can put the learned information into action by applying it in a real-world scenario. Some practical application assessments include, but are not limited to:

- Real world labs – Students will perform hands-on activities with the equipment based on a given set of instructions. Upon completion, they must develop a lab report summarizing their findings.
- Professional performance – While academics and discipline are separate entities, they are conjunctive in this shop because acting in a professional manner during lab is of paramount importance. Therefore, students will be assessed on their behavior in the lab.
- Projects – There will be a project each trimester. Successful completion of the project demonstrates that the students can practically apply most (or all) of the unit’s concepts.

V. Scope and Sequence:

I = Introduce D = Develop R = Reinforce M = Master	
Act as a responsible and contributing citizen and employee.	I, D
Apply appropriate academic and technical skills.	I, D
Communicate clearly and effectively and with reason.	I, D
Utilize critical thinking to make sense of problems and persevere in solving them.	I, D
Use technology to enhance productivity.	I, D
Work productively in teams while using cultural global competence.	I, D, R

Demonstrate effective professional communication skills and practices that enable positive customer relationships.	I, D
Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors.	I, D, R
Describe trends in emerging and evolving computer technologies and their influence on IT practices.	I, D
Perform standard computer backup and restore procedures to protect IT information.	I, D, R
Recognize and analyze potential IT security threats to develop and maintain security requirements.	I
Describe the use of computer forensics to prevent and solve information technology crimes and security breaches.	I
Demonstrate knowledge of the hardware components associated with information systems.	I, D, R, M
Compare key functions and applications of software and determine maintenance strategies for computer systems.	I, D
Provide technology support to maintain service.	I, D, R
Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.	I, D, R
Apply appropriate troubleshooting techniques in resolving computer hardware, software, and configuration problems.	I, D
Perform installation, configuration and maintenance of operating systems.	I, D, R
Demonstrate the use of networking concepts to develop a network.	I, D
Evaluate the effectiveness of an information system.	I, D

Employ system installation and maintenance skills to setup and maintain an information system.	I, D
Employ system administration and control skills to monitor the performance of an information system.	I, D
Employ technical writing and documentation skills in support of an information system.	I, D
Apply quality assurance processes to maximize information system operation.	I, D
Analyze customer software needs and requirements.	I, D
Program a computer application using the appropriate programming language.	I
Analyze customer or organizational network system needs and requirements.	I, D
Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).	I
Design a network system using technologies, tools and standards.	I
Perform network system installation and configuration.	I
Perform network administration, monitoring and support to maintain a network system.	I

VI. Course Textbooks, Instructional Resources & Software:

Student Resources	Teacher Resources
Digital	Digital

TestOut's LabSim PC Pro: <http://www.testout.com/>

- Fact sheets (notes)
- Video lessons
- Video demonstrations
- Lab simulations
- Formative assessments
- Practice exams
- Simulated sandbox environment
- Certification program

Microsoft Visio

- Industry standard software for IT blueprints

Cisco Packet Tracer

- Industry standard software for designing mock networks
- Simulates real world packet transmissions and routing
- Simulates real world TCP/IP configuration and network management

Cisco Networking Academy

- Contains Python Academy, Cybersecurity Academy, Networking Essentials, and many other resources tied to the curriculum

Print/E-Book

TestOut's LabSim PC Pro: <http://www.testout.com/>

- Custom exam creation
- Student progress monitoring
- Scoresheet based on criteria
- Answer keys
- Certification administration
- Teacher resources

Microsoft Visio

- Industry standard software for IT blueprints

Cisco Packet Tracer

- Industry standard software for designing mock networks
- Simulates real world packet transmissions and routing
- Simulates real world TCP/IP configuration and network management

Cisco Networking Academy

- Contains Python Academy, Cybersecurity Academy, Networking Essentials, and many other resources tied to the curriculum

Print/E-Book

Mike Meyer's Guide to Managing and Troubleshooting PCs, 5th Edition

Author: Mike Meyers

Publisher: McGraw Hill 2016

ISBN-13: 978-1259589546

ISBN-10: 1259589544

Mike Meyer's Guide to Managing and Troubleshooting PCs, Lab Manual, 5th Edition

Author: Mike Meyers

Publisher: McGraw Hill 2016

ISBN-13: 978-1259643446

ISBN-10: 1259643441

Using Information Technology 11e: A Practical Introduction to Computers & Communication

Author: Sawyer and Williams

Publisher: McGraw Hill 2014.

ISBN-13: 978-0073516882

ISBN-10: 0073516880

Physical Parts

- System Components to build a PC (Case, Power supply, CPU, RAM, Motherboard, Video card)
- PC Toolkits for installing and removing components
- Practice laptops to remove and replace components

Mike Meyer's Guide to Managing and Troubleshooting PCs, 5th Edition

Author: Mike Meyers

Publisher: McGraw Hill 2016

ISBN-13: 978-1259589546

ISBN-10: 1259589544

Mike Meyer's Guide to Managing and Troubleshooting PCs, Lab Manual, 5th Edition

Author: Mike Meyers

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ISBN-13: 978-1259643446

ISBN-10: 1259643441

Using Information Technology 11e: A Practical Introduction to Computers & Communication

Author: Sawyer and Williams

Publisher: McGraw Hill 2014.

ISBN-13: 978-0073516882

ISBN-10: 0073516880

VII. Student Handout

Information Technology & Network Security (ITNS) I is a full year study designed as a course to prepare the student for TestOut's PC Pro certification—a comprehensive, real-world study consisting of all concepts of hardware/peripherals, basic networking, security, operating system (Windows, Mac OS, Linux) installation, maintenance, and troubleshooting, and mobile technologies. Moreover, students will learn how to spec PCs based on customer needs. Acquiring the PC Pro certification will qualify and allow students, should they choose, to pursue CompTIA's A+ certification. Students will complete the course with a full understanding of information technology and its many realms, thereby allowing them to eventually branch out to a specific area of study.

PROFICIENCIES

- A. Demonstrate how to work safely in professional environment.
- B. Use resources to examine trends, certifications, and careers in Information Technology.
- C. Demonstrate the parts of the PC and their functions.
- D. Perform basic coding in Python.
- E. Demonstrate how Cloud computing works.
- F. Properly install and configure PC peripherals.
- G. Install, configure, and maintain a Windows operating system.
- H. Perform configuration settings in Linux and Mac OS.
- I. Build a computer from scratch.
- J. Customize component selection based on client needs.
- K. Configure a virtual machine.
- L. Manage files and folders.
- M. Configure NTFS permissions.
- N. Master Command Line Interface (CLI) commands
- O. Implement storage solutions.
- P. Troubleshoot device installation.
- Q. Configure mobile devices.
- R. Install and configure a small office/home office (SOHO) network.

- S. Test network connectivity using TCP/IP tools.
- T. Demonstrate how to protect a PC from malware.
- U. Configure wireless settings.
- V. Configure methods to connect to the Internet.
- W. Train users on security measures.
- X. Implement a security plan.
- Y. Develop a troubleshooting approach.