QUINCY HIGH SCHOOL

100 Coddington Street – Quincy, Massachusetts 02169

Program Guide

2016-2017

Course Numbers 7321, 7324, and 7327

Information Technology 1, 2, and 3

Edward Holmes

Courses in fulfillment of the requirements for

Information Support Services and Networking
CIP: 110401

Program Philosophy

The philosophy of the Information Technology Program is to provide a comprehensive technical education for all of our students. The program is dedicated to preparing students for twenty-first century careers in the ever-changing and ever-growing Information Technology industry. Students not only develop and master computer repair and networking skills but also skills related to communication, interpersonal interaction, adaptability, and analysis and processing of information. The essential objective of the program is to develop competent workers who can think critically and creatively, work independently as well as cooperatively, solve problems efficiently and share knowledge effectively. The course instruction utilizes the competencies and objectives contained within the six strands of the Information Support & Services & Networking Vocational Technical Education (VTE) Frameworks.

Contents

Information Technology 1

Course Number: 7321
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Course Level: Honors Point Value: 5

The contents of this syllabus support the Massachusetts DECE Vocational Technical Education Frameworks: Information Technology Services – Information Support Services and Networking. This Syllabus also supports curriculum to prepare students for CompTIA A+ certification.

Course Description:

In this first course in a sequence of three, students will focus on the diagnosing, troubleshooting, upgrading and repairing of Personal Computers (PCs) by learning about microcomputer components, hardware, software, operating systems and other input/output devices. Hands on labs are an integral part of this course. The primary goal of this course is to give students the basic knowledge and foundation in preparing for and ultimately passing the CompTia A+ Certification Exam. Students will gain an understanding of all aspects of the industry.

Texts/Instructional Materials:

Cisco Networking Academy – IT Essentials: PC Hardware and Software
Class Web Site: http://infotech66.tripod.com
Schoology site for assignment submission.

Supplemental Resources:
On-line activities and resources too numerous to list.

Portfolios:

Students are required to keep a portfolio of their work. This is done in two ways. Students will keep a notebook of written projects, lab reports, observations, notes, and journal entries. For this students should have a standard three ring binder of approximately 2" or more. Secondly students will keep an electronic portfolio of their work. This information will be stored on a classroom public file server computer. Although not required, it is highly recommended that students have a USB flash memory device to securely back up files and make files available for homework assignments.

Assessment Methods:

Portfolios
Teacher Observations
Oral presentations
Projects
Notebooks
Diagnostic testing
Oral Exams
Interdisciplinary activities
Simulations
Open ended questions
Word problems
Lab Experiments & Report s
Multimedia presentations
Objective Tests/Quizzes
Exams
Mid-Year Exam
Final Exam
Essays
Research papers
Presentations
Attendance
Class Participation
Document Analysis
Homework
Technical Projects

Grading Policy:

20% - Lab Projects/Class work
20% - Employability skills *
20% - Homework/Projects/Portfolio
20% - Quizzes/Tests
20% - Mid-Term/Final Exams

Students will be graded on a percentage basis according to the student handbook guidelines as follows:

99-97=A+
96-93=A
92-90=A-
89-87=B+
86-83=B
82-80=B-
79-77=C+
76-73=C
72-70=C-
69-67=D+
66-63=D (minimum passing)
Below 63 (failing)

Competency-based, hands-on type activities will be graded based on the level of proficiency of the task to be evaluated. A sample grading structure is as follows:

Grade	Performance Level
4 (A Level)	**Highly Proficient**: Can complete the skill quickly and accurately with initiative and can direct others in performing the skill.
3 (B Level)	**Competent**: Can do all parts of the task. Needs only a spot check of completed work and meets minimum entry level requirements for speed and accuracy.
2 (C Level)	**Partly Proficient**: Can perform the task satisfactorily, but requires periodic supervision and/or assistance and may not meet entry level requirements for speed and accuracy.
1 (D Level)	**Limited**: Can perform parts of the skill satisfactorily, but requires considerable assistance and supervision.
0 (Failing)	Not Competent: Cannot perform the skill satisfactorily without assistance.

Employability:

Employability is about being able to find and keep fulfilling work. There are several soft skills necessary to develop in order to be successful in any career. The National Association of Colleges and Employers lists these top 10 skills employers seek:

1. Communication Skills (Oral and Written)
2. Honesty/Integrity
3. Teamwork Skills
4. Strong Work Ethic
5. Analytical Skills
6. Flexibility/Adaptability
7. Interpersonal Skills
8. Motivation/Initiative
9. Computer Skills
10. Detail Oriented

General Class Guidelines:

HOMEWORK: Students can expect a significant amount of homework (reading, review questions, on-line research, etc.). Homework preparation is essential in order to keep "lecture" time brief and have more hands-on time. Homework will be graded and will be combined with the class portfolio to represent 20% of the class grade. In order to complete assignments students will be expected to have Internet access and an active e-mail account. Though a computer at home may make homework completion easier, this does not mean that a home computer is necessary. Students can access the Internet at the Quincy Public Library and other locations.

LATE ASSIGNMENTS: Homework and class assignments are expected to be completed on-time. Late assignments will generally not be accepted. In the event of an excused absence, homework due the day of the absence will be accepted on the first day the student returns to class following the absence. Homework assigned that day will be given one day for each day absent to make up the work. Note that this grace period does not apply to pre-assigned homework or assignments posted on the class Web site.

ATTENDANCE: Students are expected to be in class, on time, each class period. Class activities will begin promptly at the starting bell. Attendance is counted as an employability grade and is graded quarterly. Three unexcused tardies and/or dismissals will be counted as one unexcused absence.

Term Attendance	Points
Perfect Attendance	10
1 Absence	9
2-3 Absences	8
4-5 Absences	7
6 Absences	6
7 or More Absences*	0

* 7 or more unexcused absences constitute course failure for the term – See handbook for details. "Requirements for Vocational Technical Certification – All students who successfully complete their course of study will receive a High School Diploma and a Certificate of Technical Proficiency. Any student who misses more than 14 days due to absences, including suspensions, cannot accrue the necessary shop hours and related instruction to be eligible for a Technical Certificate" – QHS Student-Parent Handbook.

CLASS CUTS: Class Cuts are dealt with severely. If a student chooses to cut a class he/she will receive a "0" for any daily class grade given as well as any homework, assignment, quiz or test due during the class cut. Class cuts will also be factored into the Employability Skills grade in that employers want employees who will come to work. Lastly, per the student handbook, class cuts will be turned in to the student's dean who may apply additional consequences, and the cut will result in a 5 point deduction in class grade. See the student handbook for a complete schedule of grade reductions for class cuts.

TERM PROJECTS: As many as 4 major term projects will be assigned throughout the course. The bulk of these projects will be completed outside of class. Ample time will be given to complete the projects. Some projects will be individual efforts and some may be collaborative projects. Teams for collaborative work will be selected at random by Mr. Holmes.

FIELD TRIPS AND DISMISSALS: In order for students to be allowed to miss class for a school sponsored activity (field trips, sports, etc.) must be in good standing with a class average of 70 or higher. Students who are not in good standing (including but not limited to missing assignments, in danger of failing, and/or showing poor employability skills) will not be permitted to miss class. In such event the student's sign-out sheet will be marked to indicate that the student is not in good standing. Attending a school sponsored activity without prior approval will be deemed a class cut and will be handled accordingly.

Information Technology 1 Planned Course Schedule

Week	Days	Topic/Outcomes	Cisco Networking Academy – IT Essentials	DESE – Information Support Services and Networking Frameworks Addressed *(Items in black indicate legacy, pre-2013, ISSN frameworks)* *(Items in red indicate frameworks addressed previously in current course or prior courses.)*
1	1 1 1 2	Class expectations Introduction to Information Technology Introduction to Employability • What are the 10 highly sought employability Skills? Safe and Responsible Use of Technology • Review School Acceptable Use policy • Develop a shop Acceptble Use Policy • Protecting privacy and data integrity	Chapter 0 – IT Essentials	2.J Explain information technology's role in the workplace and society. 3.C.29c Explain Moore's Law VIT.VISSN.4.A.04.10: Value the importance of professionalism, including reliability, honesty, responsibility, and ethics. VIT.VISSN.4.A.01.03: Develop a career plan with alternatives. VIT.VISSN.4.A.01.08: Demonstrate employability skills needed to get and keep a job. VIT.VISSN.6.A.02: Demonstrate responsible use of technology and an understanding of ethics and safety issues in using electronic media at home, in school and in society. VIT.VISSN.6.A.02.02: Explain issues related to the responsible use of technology (e.g., privacy, security). VIT.VISSN.2.B.02.02: Identify and describe the various IT career paths. VIT.VISSN.2.B.02.01: Identify and list professional certifications. VIT.VISSN.2.B.01.02: Describe the impact of technologies on society. VIT.VISSN.2.B.01.03: Identify technologies and describe their uses in the workplace and society. VIT.VISSN.4.A.01.01: Evaluate industries, organizations, and careers based on multiple sources of research and information. VIT.VISSN.4.A.01.02: Assess interest areas to determine potential career pathways, including career ladders. VIT.VISSN.6.A.02.01: Demonstrate compliance with the school's Acceptable Use Policy. VIT.VISSN.6.A.03.06: Explain and use practices to protect one's personal safety online (e.g., not sharing personal information with strangers, being alert for online predators, reporting suspicious activities).
2	1 1	Shop safety • Locate Safety Data sheets, describe their contents and function. • What is the Safety Equipment in the IT Shop?		VIT.VISSN.1.A.02: Demonstrate health and safety practices. VIT.VISSN.1.A.02.01: Identify, describe and demonstrate the effective use of Material Safety Data Sheets (MSDS). VIT.VISSN.1.A.02.02: Read chemical, product, and equipment labels to determine appropriate health and safety considerations. VIT.VISSN.1.A.02.03: Identify, describe and demonstrate personal, shop and job site safety practices and procedures.

		Personal Protective Equipment (PPE)		VIT.VISSN.1.A.02.04: Demonstrate safe dress and use of relevant safety gear and personal protective equipment (PPE), including wrist rests, adjustable workspaces and equipment, gloves, boots, earplugs, eye protection, and breathing apparatus. VIT.VISSN.2.A.02.04: Demonstrate protection from airborne particles, dust and debris. VIT.VISSN.1.A.02.06: Locate emergency equipment in your lab, shop, and classroom, including (where appropriate) eyewash stations, shower facilities, sinks, fire extinguishers, fire blankets, telephone, master power switches, and emergency exits. VIT.VISSN.1.A.02.07: Demonstrate the safe use, storage, and maintenance of every piece of equipment in the lab, shop, and classroom. VIT.VISSN.1.A.02.10: Demonstrate proper workspace cleaning procedures.
	1	Electrical Safety • What are the safety concerns working with electricity?		VIT.VISSN.1.A.02.08: Describe safety practices and procedures to be followed when working with and around electricity.
	1	Tool Safety • Demonstrate the safe use of all tools in the IT Shop		VIT.VISSN.2.A.01: Demonstrate appropriate use of safety procedures and tools.
	1	First Aid Procedures • Describe First Aid procedures for potential injuries and other health concerns in the IT field		VIT.VISSN.1.A.03.01: Describe First Aid procedures for potential injuries and other health concerns in the occupational area.
3	2	Introduction to IT Communication • What is the importance of proper communication? • Why is documentation so important?		VIT.VISSN.4.A.02: Communicate in multiple modes to address needs within the career and technical field. VIT.VISSN.4.A.02.01: Apply strategies to enhance effectiveness of all types of communications in the workplace. 2.N.02 Identify user support needed for a variety of situations. 2.N.03 Describe how to respond professionally to user requests. 2.N.05 Illustrate methods used to communicate and document technical support provided. 2.N.08 Identify means to communicate with customer within support boundaries. VIT.VISSN.4.A.02.13: Communicate with others in a diverse workforce.

	3	Introduction to the PC • Explain how personal computer system components work together. • Select the appropriate computer components. • Explain how hardware is configured for task-specific computers.	Chapter 1 – Introduction to the PC	
4	2	Review of Lab Procedures and Tool Use • Explain the purpose of safe working conditions and safe lab procedures. • Explain how to use tools and software with personal computer components.	Chapter 2 – Lab Procedures and Safe Tool Use	VIT.VISSN.2.A.01: Demonstrate appropriate use of safety procedures and tools. VIT.VISSN.2.A.01.01: Explain the dangers of Electrostatic Discharge (ESD). VIT.VISSN.2.A.01.02: List the tools to protect against ESD. VIT.VISSN.2.A.01.03: Demonstrate appropriate use of ESD safety tools. VIT.VISSN.2.A.01: Demonstrate appropriate use of safety procedures and tools.
4-6	2	Motherboards • Identify and describe the functions of motherboard components	Chapter 3 – Computer Assembly	VIT.VISSN.2.C.01.01: Identify and configure BIOS Settings. VIT.VISSN.2.C.01.02: Install firmware upgrades. VIT.VISSN.2.C.01.03: Use built-in diagnostics and monitoring. VIT.VISSN.2.C.02.01: Identify and describe the purpose of all motherboard components (e.g., socket types, expansion slots, ports, bus speed, random access memory (RAM) slots, chipsets, connectors and jumpers). VIT.VISSN.2.C.02.02: Classify various form factors. VIT.VISSN.2.C.03: Describe and install various random access memory (RAM) types. VIT.VISSN.2.C.04: Install expansion cards. VIT.VISSN.2.C.04.01: Differentiate between different expansion card types. VIT.VISSN.2.C.06: Differentiate among various central processing unit (CPU) types and corresponding cooling devices. VIT.VISSN.2.C.06.01: List types and features of CPUs and their socket types. VIT.VISSN.2.C.06.02: Choose appropriate CPU for various motherboards. VIT.VISSN.2.C.06.03: Install CPUs and appropriate coolers.

	2 5 4	Power Supplies • What is the purpose of the computer power supply? • Install power supplies • Test and troubleshoot power supplies Computer Assembly • Build a computer. • Explain how to verify BIOS and UEFI settings. • Explain how to upgrade components in a computer system to meet requirements. Office Applications: Microsoft Word • Use Microsoft Word to create documents • Use word processing features		VIT.VISSN.2.C.07.01: Determine power supply characteristics and specifications for types of voltage and power. VIT.VISSN.2.C.07.02: Select and install the proper power supply. 3.C.09c Explain the relationship between resistance, voltage, and current (Ohm's Law). 3.C.11c Identify appropriate units of measurement for current, voltage, and resistance, and explain how they are measured 3.C.27c Describe the differences between Alternating Current (AC) and Direct Current (DC). VIT.VISSN.2.C.04.02: Configure and install appropriate device drivers and software for optimal operation. VIT.VISSN.2.C.07: Install power supplies. VIT.VISSN.2.C.02.03: Install various motherboards in appropriate chassis. VIT.VISSN.2.C.03: Describe and install various random access memory (RAM) types. VIT.VISSN.2.C.03.01: Compare and contrast different RAM types. VIT.VISSN.2.C.03.02: Distinguish between RAM compatibility and speed. VIT.VISSN.2.C.03.03: Install and test various RAM types. 2.Y.05 Install, configure and test IDE/EIDE devices 2.AA.03 Install and configure and test various cards. VIT.VISSN.6.A.01.06: Identify the use of word processing and desktop publishing skills in various careers. VIT.VISSN.6.A.01: Demonstrate proficiency in the use of computers and applications, as well as an understanding of the concepts underlying hardware, software, and connectivity. VIT.VISSN.6.A.01.04: Apply advanced formatting and page layout features when appropriate (e.g., columns, templates, and styles) to improve the appearance of documents and materials. VIT.VISSN.6.A.01.05: Use editing features appropriately (e.g., track changes, insert comments).
6-7	5	Input and Output Systems		VIT.VISSN.2.C.01: Configure Basic Input Output System (BIOS) Settings. VIT.VISSN.2.C.09: Evaluate characteristics of display devices. VIT.VISSN.2.C.09.01: Identify different types of display devices, their connection types and cables. VIT.VISSN.2.C.09.02 : Define refresh rates, resolution, native resolution, brightness/lumens. VIT.VISSN.2.C.09.03: Explain the use of analog vs. digital, privacy/antiglare filters and multiple displays. VIT.VISSN.2.C.10: Set up peripheral devices. VIT.VISSN.2.C.10.01: Install and configure input, output and multimedia devices.

	5	Mass Storage Systems • Identify types of storage devices • What are the differences between partitions and arrays?		2.Y.05 Install, configure and test IDE/EIDE devices VIT.VISSN.2.C.05: Install storage devices and media. VIT.VISSN.2.C.05.01: Identify storage devices, their connection types and cables. VIT.VISSN.2.C.05.02: Install and configure storage devices and media. VIT.VISSN.2.C.05.03: Demonstrate the appropriate use of media. VIT.VISSN.2.C.05.04: Describe redundant array of independent disk (RAID) types. VIT.VISSN.2.S.04.02: **Advanced** Classify RAID (RAID 0, RAID 1, RAID 5, RAID 10 and combinations; hardware and software RAID). VIT.VISSN.6.A.01.03: Explain effective backup and recovery strategies. VIT.VISSN.2.S.06.02: **Advanced** Explain the value of business continuity (i.e., backup and restore, disaster recovery and data redundancy). VIT.VISSN.2.S.04.01: **Advanced** Indicate advantages and disadvantages of different storage technologies; local (SATA, SCSI, IDE); NAS; SAN; fiber channel; iSCSI; NFS; FC HBA and FC switches; iSCSI hardware. VIT.VISSN.2.S.04.03: **Advanced** Identify disk types (ATA; basic disk; dynamic disk; mount points; file systems; mounting a virtual hard disk; distributed file systems; optical disks).
8-9	5 5	Preventive Maintenance • Explain why preventive maintenance must be performed on personal computers. Troubleshooting • Explain how to troubleshoot computer problems	Chapter 4 – Overview of Preventive Maintenance and Troubleshooting	VIT.VISSN.2.F.04: Perform preventive maintenance procedures using appropriate tools. VIT.VISSN.2.M.01: Explain the troubleshooting theory. VIT.VISSN.2.M.01.01: Identify the IT related problem. VIT.VISSN.2.M.01.02: Establish a theory of probable cause (question the obvious) using common symptoms. VIT.VISSN.2.M.01.03: Test the theory to determine cause using diagnostic tools. VIT.VISSN.2.M.01.04: Establish a plan of action to resolve the problem and implement the solution. VIT.VISSN.2.M.01.05: Verify full system functionality and, if applicable, implement preventive measures. VIT.VISSN.2.M.01.06: Document findings, actions and outcomes.
	End Quarter 1			
10	5	Operating Systems		VIT.VISSN.2.F.01 Explain features and requirements of popular Desktop Operating Systems. VIT.VISSN.2.F.01.01 Compare and contrast current

				Operating Systems (OS) and their features. VIT.VISSN.2.F.01.02 Select the appropriate OS for a 32-bit or 64-bit environment. VIT.VISSN.2.F.01.03 Illustrate operating system upgrade paths. VIT.VISSN.2.F.02.02 Differentiate among available OS installation methods.
11-12	2	Windows Operating Systems • Explain operating system requirements. • Identify boot files and boot-up procedures and options	Chapter 5 – Windows Installation	VIT.VISSN.2.F.02 Install and configure Operating Systems using the most appropriate method. VIT.VISSN.2.F.02.01 Identify boot methods. VIT.VISSN.2.F.02.05 Select suitable setting for operating system customization.
	5	OS Installation • Partitions • Install a Microsoft Windows operating system.		VIT.VISSN.2.F.02.03 Partition the hard drive. VIT.VISSN.2.F.02.04 Format a hard drive using the appropriate file system. VIT.VISSN.2.F.02.06 Install drivers, software and OS updates. VIT.VISSN.2.F.03 Utilize appropriate operating system features and tools.
	3	Research Project • Communicate effectively in writing • Use proper source citation		VIT.VISSN.6.A.04.04: Use a variety of media to present information for specific purposes (e.g., reports, research papers, presentations, newsletters, Web sites, podcasts, blogs), citing sources. VIT.VISSN.4.A.02.07: Use writing / publishing / presentation applications. VIT.VISSN.6.A.04.04: Use a variety of media to present information for specific purposes (e.g., reports, research papers, presentations, newsletters, Web sites, podcasts, blogs), citing sources.
13	4	Using and Configuring Windows • Perform routine system management tasks with common Microsoft Windows tools. • Use common preventive maintenance techniques for Microsoft Windows operating systems • Explain how to troubleshoot	Chapter 6 – Windows Configuration and Management	VIT.VISSN.2.F.03.01 Demonstrate the use of built in operating system features and tools (administrative, disk management, run line commands) and how to access through appropriate paths. VIT.VISSN.2.F.03.02 Explore different utilities within control panel/system tools/system settings. VIT.VISSN.2.F.03.03 Configure local network settings. VIT.VISSN.2.F.03.04 Use OS command line tools. VIT.VISSN.2.F.04.01: Implement best practices (schedule backups, check disks, defrag, updates, patch management, driver/firmware updates and antivirus updates). VIT.VISSN.2.F.04.02: Utilize tools for backup, system restore, check disk, recovery image, and defrag. VIT.VISSN.2.F.05: Explain the differences among basic OS security settings. VIT.VISSN.2.F.05.01: Create users and groups. VIT.VISSN.2.F.05.02 : Compare new technology file

	1	Windows Operating Systems Install and configure software		system (NTFS) vs. share permissions. VIT.VISSN.2.F.05.03 : Share files and folders. VIT.VISSN.2.F.05.04: Identify system files and folders. VIT.VISSN.2.F.05.05 : Explain the process of local user authentication. VIT.VISSN.6.A.03.03: Describe devices, applications, and operating system features that offer accessibility for people with disabilities. VIT.VISSN.2.F.04: Perform preventive maintenance procedures using appropriate tools. VIT.VISSN.2.N.01: Identify the function of various local and network applications. VIT.VISSN.2.N.01.01: Categorize applications by type and use. VIT.VISSN.2.N.02 Install applications. VIT.VISSN.2.N.02.01: Install, configure and test local and network applications. VIT.VISSN.2.N.02.02: Install, configure and test internet browser packages. VIT.VISSN.2.N.02.03: Uninstall applications. VIT.VISSN.2.N.02.04: Acquire and verify software licensure. VIT.VISSN.2.N.02.05: Identify steps to perform an upgrade and determine compatibility issues. VIT.VISSN.2.N.02.06: Retrieve, install and test application patches, updates and service packs.
14	5	Client-side Virtualization • Configure virtualization on a computer.	Chapter 6 – Windows Configuration and Management	VIT.VISSN.2.F.06: Explain the basics of client-side virtualization. VIT.VISSN.2.F.06.01: Discuss the purpose of virtual machines. VIT.VISSN.2.F.06.02: Assess virtual client requirements. VIT.VISSN.2.F.06.03: Define virtual machine managers (e.g., Hypervisor).
15	3	Data Communication and Networking • Explain components and types of computer networks. • Explain the purpose and characteristics of networking standards • Explain the purpose of physical components of a network • Configure network connectivity between PCs	Chapter 7 – Network Concepts	2.B Explain basic network technologies. VIT.VISSN.2.I.03: Explain the purpose and properties of IP Addressing. VIT.VISSN.2.I.03.01: Identify the Classes of addresses. VIT.VISSN.2.I.04: Explain Dynamic Host Configuration Protocol (DHCP) concepts, describe its components and configure DHCP service. VIT.VISSN.2.I.04.01: Explain DHCP client and server side elements (reservations, scopes, leases). VIT.VISSN.2.I.04.02: Configure DHCP service. VIT.VISSN.2.J.01.02: Identify copper cable types (Twisted Pair and Coaxial) and associated connector types. VIT.VISSN.2.J.04 Categorize various network types and topologies.

	1 1	Microsoft Office Activity: Excel • Create Spreadsheets • Use spreadsheets to convey information in charts and graphs Technology Timeline • Describe the evolution of technology • Illustrate the IT timeline		VIT.VISSN.6.A.01.08: Define and use functions of a spreadsheet application (e.g., sort, filter, find). VIT.VISSN.6.A.01.09: Explain how various formatting options are used to convey information in charts or graphs. VIT.VISSN.6.A.01.10: Identify the use of spreadsheet skills in various careers. 6.G Create and use spreadsheets. 6.E Use and relate common interfaces and applications. VIT.VISSN.2.B.01: Describe the evolution of technology. VIT.VISSN.2.B.01.01: Illustrate the information technology (IT) timeline (evolution).
16	5	Network Configuration • Connect a computer to wired and wireless networks. • Explain the purpose and characteristics of ISP connection technologies. • Explain Cloud concepts and networked-host services • Explain how to perform preventive maintenance on networks using common techniques. • Explain how to troubleshoot networks.	Chapter 8 – Applied Networking	VIT.VISSN.2.R.02.13: **Advanced** Verify network status and switch operation using basic utilities (including: ping, traceroute, telnet, SSH, arp, ipconfig), SHOW & DEBUG commands VIT.VISSN.2.J.04.01 Differentiate among LAN, WAN, PAN, MAN, WLAN, and WWAN.
17	5	Fundamental Laptops • Explain the purpose and characteristics of laptops • Explain how to configure laptop power settings and wireless settings. • Explain how to remove and install	Chapter 9 – Laptops and Mobile Devices	VIT.VISSN.2.D.01: Configure laptop hardware and components. VIT.VISSN.2.D.01.01: List and characterize expansion options. VIT.VISSN.2.D.01.02: Install and configure hardware/device replacement components. VIT.VISSN.2.D.01.03: Compare and contrast laptop display components including WIFI antenna, inverter and backlight. VIT.VISSN.2.D.02: Compare and contrast laptop features. VIT.VISSN.2.D.02.01: Identify special function keys, physical laptop lock and cable lock. VIT.VISSN.2.D.02.02: Compare and contrast laptop

		laptop components.		docking station vs. port replicator. VIT.VISSN.2.H.04: Compare and contrast hardware differences in regards to tablets and laptops. VIT.VISSN.2.H.04.01: Identify power consumption optimization techniques. VIT.VISSN.2.H.04.02: Demonstrate proper handling, cleaning and docking of tablets and laptops.
18		Mid Year Exams	Chapters 1-8	
		End Quarter 2		
19	5	Portable Devices • Explain the purpose and characteristics of mobile devices. • Explain how to perform common preventive maintenance techniques for laptops and mobile devices. • Explain how to troubleshoot laptops and mobile devices.	Chapter 9 – Laptops and Mobile Devices	VIT.VISSN.2.M.07: Troubleshoot and repair common laptop issues while adhering to the appropriate procedures. VIT.VISSN.2.H.02: Establish basic network connectivity and configure email. VIT.VISSN.2.H.02.01: Configure wireless, cellular, Bluetooth connectivity. VIT.VISSN.2.H.02.02: Configure an email application. VIT.VISSN.2.H.03: Secure mobile devices. VIT.VISSN.2.H.03.01 Define and describe pass code locks, remote wipes, locator applications, remote backup applications, failed login attempts restrictions. VIT.VISSN.2.H.03.02: Distinguish among appropriate antivirus applications and available OS updates and patches. VIT.VISSN.2.H.03.03: Install and update mobile OS software. VIT.VISSN.2.H.05: Execute and configure mobile device synchronization. VIT.VISSN.2.H.05.01: Explain the types and requirements of mobile data synchronization methods. VIT.VISSN.2.H.05.02: Synchronize mobile devices.
20	2 3	Mobile OS • Explain the purpose and characteristics of mobile operating systems. • Explain methods for securing mobile devices. • Explain how to configure network connectivity and email on mobile devices. Linux/Unix and Mac OSX • Explain the purpose and characteristics of Linux and OS X operating	Chapter 10 - Mobile, Linux, and OS X Operating Systems	VIT.VISSN.2.H.01: Explain the basic features of mobile operating systems. VIT.VISSN.2.H.01.01: Compare and contrast current mobile Operating Systems and their features. VIT.VISSN.2.F.01.01 Compare and contrast current Operating Systems (OS) and their features.

		systems. • Explain how to troubleshoot Mobile, Linux, and OS X operating systems		
21-22	2 4 2 2	Types Printers • Explain the purpose and characteristics of different types of printers. Laser Printers • Precautions • 7 Steps of the Photoconductive Process Printer Installation and configuration • Install a printer. • Configure printer sharing. • Explain how to improve printer availability Troubleshooting Printers	Chapter 11 - Printers	VIT.VISSN.2.E.01: Summarize printer types, installation and maintenance. VIT.VISSN.2.E.01.01: Explain the differences between the various printer types. VIT.VISSN.2.E.01.02 : Summarize the associated imaging process for each type of printer. VIT.VISSN.2.E.01.03: Install and configure various printers with appropriate cables and printer drivers. VIT.VISSN.2.E.01.04 : Perform printer maintenance.
23	5	Microsoft Office Activity: PowerPoint		VIT.VISSN.4.A.02.07: Use writing / publishing / presentation applications.
24 – 25	3 7	Data Protection Security • Explain security threats. • Configure IT security. • Manage IT security on an	 Chapter 12 Security	VIT.VISSN.2.A.01.01: Explain the dangers of Electrostatic Discharge (ESD). VIT.VISSN.2.A.01.02: List the tools to protect against ESD. VIT.VISSN.2.A.01.03: Demonstrate appropriate use of ESD safety tools. VIT.VISSN.6.A.01.03: Explain effective backup and recovery strategies. VIT.VISSN.6.A.03.07: Explain ways individuals can protect their technology systems and information from unethical users. VIT.VISSN.6.A.01.14: Describe good practices for password protection and authentication. VIT.VISSN.2.G.01: Describe common prevention methods. VIT.VISSN.2.G.01.01: Describe physical and digital

		ongoing basis. • Explain how to troubleshoot basic security problems.		security techniques. VIT.VISSN.2.G.01.02: Explain user education and the principle of least privilege. VIT.VISSN.2.G.02: Compare and contrast common security threats. VIT.VISSN.2.G.02.01: Differentiate between social engineering, malware, rootkits, phishing, shoulder surfing, spyware and viruses. VIT.VISSN.2.G.03: Implement best practices to secure a workstation. VIT.VISSN.2.G.03.01: Create a strong password policy. VIT.VISSN.2.G.03.02: Change or disable default user names, accounts and auto-run. VIT.VISSN.2.G.04: Describe appropriate data destruction/disposal methods. VIT.VISSN.2.G.04.01: Compare low level format vs. standard format. VIT.VISSN.2.G.04.02: Explain hard drive sanitation methods and physical destruction.
26-27	10	IT Professional • Explain why good communication skills are a critical part of IT work • Explain appropriate behavior when faced with the legal and ethical issues that arise in the IT industry • Explain the call center environment and technician responsibilities	Chapter 13 – The IT Professional	VIT.VISSN.2.A.03.01: Use proper language - avoid jargon, acronyms, and slang when applicable. VIT.VISSN.2.A.03.02: Set and meet expectations/timeline and communicate status with the customer. VIT.VISSN.2.A.03.03: Deal appropriately with customers concerning attitude, cultural sensitivity, punctuality, difficult situations and confidential materials. VIT.VISSN.2.A.04.02: Explain use of documentation/documentation changes. VIT.VISSN.4.A.02.09: Explain proper telephone etiquette and skills. VIT.VISSN.4.A.02.12: Apply active listening skills to obtain and clarify information. VIT.VISSN.4.A.02.13: Communicate with others in a diverse workforce.
		End Quarter 3		
28-34	1	Troubleshooting Basics	Chapter 14 – Advanced Troubleshooting	VIT.VISSN.2.M.01: Explain the troubleshooting theory. VIT.VISSN.2.M.01.01: Identify the IT related problem. VIT.VISSN.2.M.01.02: Establish a theory of probable cause (question the obvious) using common symptoms. VIT.VISSN.2.M.01.03: Test the theory to determine cause using diagnostic tools. VIT.VISSN.2.M.01.04: Establish a plan of action to resolve the problem and implement the solution. VIT.VISSN.2.M.01.05: Verify full system functionality and, if applicable, implement preventive measures. VIT.VISSN.2.M.01.06: Document findings, actions and outcomes.
	4	Troubleshoot computer components and peripherals.		VIT.VISSN.2.M.02: Troubleshoot common problems related to motherboards, RAM, CPU and power with appropriate tools. VIT.VISSN.2.M.03: Troubleshoot hard drives and RAID

	5 5 5	Troubleshoot operating systems. Troubleshoot networks. Troubleshoot security.		arrays with appropriate tools. VIT.VISSN.2.M.04: Troubleshoot common video and display issues. VIT.VISSN.2.M.07: Troubleshoot and repair common laptop issues while adhering to the appropriate procedures. VIT.VISSN.2.M.08: Troubleshoot printers with appropriate tools. VIT.VISSN.2.M.09: Troubleshoot wired and wireless networks with appropriate tools. VIT.VISSN.2.M.10 Troubleshoot common physical connectivity problems. VIT.VISSN.2.M.11: Identify and correct IP addressing issues. VIT.VISSN.2.M.12; Select appropriate hardware tools to troubleshoot connectivity issues. VIT.VISSN.2.M.06: Troubleshoot common local computer security issues with appropriate tools and best practices. VIT.VISSN.2.M.13: Select appropriate software tools to troubleshoot connectivity issues. VIT.VISSN.2.M.13.01: Install software and hardware tools, protocol analyzer, throughput testers and connectivity software. VIT.VISSN.2.M.13.02: Demonstrate common troubleshooting command line tools (Ping, Tracert/traceroute, Dig, Ipconfig/Nslookup, ArpNbtstat, Netstat).
	5	Customer Technical Support		VIT.VISSN.2.C.08: Develop customer specification and needs. VIT.VISSN.2.C.08.01: Evaluate customer needs. VIT.VISSN.2.C.08.02: Select appropriate components and software for a customer configuration (i.e., CAD workstation, audio/video editing pc, home server, gaming pc, thin client). VIT.VISSN.4.A.03: Solve problems using critical thinking. VIT.VISSN.4.A.03.01: Demonstrate skills used to define and analyze a given problem. VIT.VISSN.4.A.03.02: Explain the importance and dynamics of individual and teamwork approaches of problem solving. VIT.VISSN.6.A.01.01: Use online help and other support to learn about features of hardware and software, as well as to assess and resolve problems.
	10	Prepare and Present Technical Documentation • Speaking and Listening Research Project and Presentation Creation		2.M Prepare and present documentation VIT.VISSN.4.A.02.02: Apply reading skills and strategies to work-related documents. VIT.VISSN.4.A.02.03: Locate information from books, journals, magazines, and the Internet. VIT.VISSN.4.A.02.04: Apply basic writing skills to work-related communication. VIT.VISSN.4.A.02.05: Write work-related materials. VIT.VISSN.4.A.02.06: Explain information presented

				graphically. VIT.VISSN.4.A.02.07: Use writing / publishing / presentation applications. VIT.VISSN.4.A.02.08: Apply basic skills for work-related oral communication. VIT.VISSN.4.A.03.05: Select potential solutions based on reasoned criteria. VIT.VISSN.4.A.03.06: Implement and evaluate solution(s). VIT.VISSN.6.A.01.11: Use search engines and online directories. VIT.VISSN.6.A.01.12: Explain the differences among various search engines and how they rank results. VIT.VISSN.6.A.01.13: Explain and demonstrate effective search strategies for locating and retrieving electronic information (e.g., using syntax and Boolean logic operators). VIT.VISSN.6.A.02.03: Explain laws restricting the use of copyrighted materials. VIT.VISSN.6.A.02.04: Identify examples of plagiarism, and discuss the possible consequences of plagiarizing the work of others. VIT.VISSN.6.A.03: Design and implement a personal learning plan that includes the use of technology to support lifelong learning goals. VIT.VISSN.6.A.03.01: Evaluate the authenticity, accuracy, appropriateness, and bias of electronic resources, including Web sites. VIT.VISSN.6.A.03.02: Analyze the values and points of view that are presented in media messages.
35		Project Presentations Review		3.A.09c Deliver formal presentations for particular audiences using clear enunciation and appropriate organization, gestures, tone, and vocabulary.
36		Final Exams	Chapters 9-14	
		End Quarter 4		

Information Technology 2

Course Number: 7324
Instructor/Teacher: Edward Holmes Room: C204 Phone: (617)-376-3310
Email: edwardholmes@quincypublicschools.com Course Level: Honors Point Value: 10

The contents of this syllabus support the Massachusetts DECE Vocational Technical Education Frameworks: Information Technology Services – Information Support Services and Networking. This Syllabus also supports curriculum to prepare students for CompTIA Network+ and/or CCENT/CCNA certification.

Course Description:

This is the second course in a series of three. Students will review computer repair concepts and prepare to take the A+ certification. Students will delve into the basics for the Internet, the World Wide Web, E-mail, virus protection, file management and backup, WAN/LAN Technology, Web pages, Web sites and eCommerce. The primary goal of this course is to give students the basic knowledge and foundation in preparing for and ultimately passing the CompTIA Network+ Certification exam and/or Cisco CCENT or CCNA exams.

Texts/Instructional Materials:

Cisco Networking Academy – CCNA; Routing and Switching; Introduction to Networks
Schoology site for assignment submission.
Class Web Site: http://infotech66.tripod.com

Supplemental Resources:
Network+ Guide to Networks, 5 Ed. By Tamara Dean
On-line activities and resources too numerous to list.

Portfolios:

Students are required to keep a portfolio of their work. This is done in two ways. Students will keep a notebook of written projects, lab reports, observations, notes, and journal entries. For this students should have a standard three ring binder of approximately 2" or more. Secondly students will keep an electronic portfolio of their work. This information will be stored on a classroom public file server computer. Although not required, it is highly recommended that students have a USB flash memory device to securely back up files and make files available for homework assignments.

Assessment Methods:

Portfolios	Simulations	Final Exam
Teacher Observations	Open ended questions	Essays
Oral presentations	Word problems	Research papers
Projects	Lab Experiments & Report s	Presentations
Notebooks	Multimedia presentations	Attendance
Diagnostic testing	Objective Tests/Quizzes	Class Participation
Oral Exams	Exams	Document Analysis
Interdisciplinary activities	Mid-Year Exam	Homework

Grading Policy:

20% - Lab Projects/Class work
20% - Employability skills *
20% - Homework/Projects/Portfolio
20% - Quizzes/Tests
20% - Mid-Term/Final Exams

Students will be graded on a percentage basis according to the student handbook guidelines as follows:

99-97=A+
96-93=A
92-90=A-
89-87=B+
86-83=B
82-80=B-
79-77=C+
76-73=C
72-70=C-
69-67=D+
66-63=D (minimum passing)
Below 63 (failing)

Competency-based, hands-on type activities will be graded based on the level of proficiency of the task to be evaluated. A sample grading structure is as follows:

Grade	Performance Level
4 (A Level)	**Highly Proficient**: Can complete the skill quickly and accurately with initiative and can direct others in performing the skill.
3 (B Level)	**Competent**: Can do all parts of the task. Needs only a spot check of completed work and meets minimum entry level requirements for speed and accuracy.
2 (C Level)	**Partly Proficient**: Can perform the task satisfactorily, but requires periodic supervision and/or assistance and may not meet entry level requirements for speed and accuracy.
1 (D Level)	**Limited**: Can perform parts of the skill satisfactorily, but requires considerable assistance and supervision.
0 (Failing)	Not Competent: Cannot perform the skill satisfactorily without assistance.

Employability:

Employability is about being able to find and keep fulfilling work. There are several soft skills necessary to develop in order to be successful in any career. The National Association of Colleges and Employers lists these top 10 skills employers seek:

1. Communication Skills (Oral and Written)
2. Honesty/Integrity
3. Teamwork Skills
4. Strong Work Ethic
5. Analytical Skills
6. Flexibility/Adaptability
7. Interpersonal Skills
8. Motivation/Initiative
9. Computer Skills
10. Detail Oriented

General Class Guidelines:

HOMEWORK: Students can expect a significant amount of homework (reading, review questions, on-line research, etc.). Homework preparation is essential in order to keep "lecture" time brief and have more hands-on time. Homework will be graded and will be combined with the class portfolio to represent 20% of the class grade. In order to complete assignments students will be expected to have Internet access and an active e-mail account. Though a computer at home may make homework completion easier, this does not mean that a home computer is necessary. Students can access the Internet at the Quincy Public Library and other locations.

LATE ASSIGNMENTS: Homework and class assignments are expected to be completed on-time. Late assignments will generally not be accepted. In the event of an excused absence, homework due the day of the absence will be accepted on the first day the student returns to class following the absence. Homework assigned that day will be given one day for each day absent to make up the work. Note that this grace period does not apply to pre-assigned homework or assignments posted on the class Web site.

ATTENDANCE: Students are expected to be in class, on time, each class period. Class activities will begin promptly at the starting bell. Attendance is counted as an employability grade and is graded quarterly. Three unexcused tardies and/or dismissals will be counted as one unexcused absence.

Term Attendance	Points
Perfect Attendance	10
1 Absence	9
2-3 Absences	8
4-6 Absences	7
6 Absences	6
7 or More Absences*	0

* 7 or more unexcused absences constitute course failure for the term – See handbook for details. "Requirements for Vocational Technical Certification – All students who successfully complete their course of study will receive a High School Diploma and a Certificate of Technical Proficiency. Any student who misses more than 14 days due to absences, including suspensions, cannot accrue the necessary shop hours and related instruction to be eligible for a Technical Certificate" – QHS Student-Parent Handbook.

CLASS CUTS: Class Cuts are dealt with severely. If a student chooses to cut a class he/she will receive a "0" for any daily class grade given as well as any homework, assignment, quiz or test due during the class cut. Class cuts will also be factored into the Employability Skills grade in that employers want employees who will come to work. Lastly, per the student handbook, class cuts will be turned in to the student's dean who may apply additional consequences, and the cut will result in a 5 point deduction in class grade. See the student handbook for a complete schedule of grade reductions for class cuts.

TERM PROJECTS: As many as 4 major term projects will be assigned throughout the course. The bulk of these projects will be completed outside of class. Ample time will be given to complete the projects. Some projects will be individual efforts and some may be collaborative projects. Teams for collaborative work will be selected at random by Mr. Holmes.

FIELD TRIPS AND DISMISSALS: In order for students to be allowed to miss class for a school sponsored activity (field trips, sports, etc.) must be in good standing with a class average of 70 or higher. Students who are not in good standing (including but not limited to missing assignments, in danger of failing, and/or showing poor employability skills) will not be permitted to miss class. In such event the student's sign-out sheet will be marked to indicate that the student is not in good standing. Attending a school sponsored activity without prior approval will be deemed a class cut and will be handled accordingly.
Information Technology 2
Planned Course Schedule

Information Technology 2 Planned Course Schedule

Week	Days	Topic/Outcomes	CCNA: Routing and Switching – Introduction to Networks	DESE – Information Support Services and Networking Frameworks Addressed *(Items in black indicate legacy, pre-2013, ISSN frameworks)* *(Items in red indicate frameworks addressed previously in current course or prior courses.)*
1	1 2	Class expectations, Introduction to Employability		VIT.VISSN.4.A.04.10: Value the importance of professionalism, including reliability, honesty, responsibility, and ethics. VIT.VISSN.4.A.01: Develop employability skills to secure and keep employment in chosen field. VIT.VISSN.4.A.01.01: Evaluate industries, organizations, and careers based on multiple sources of research and information. VIT.VISSN.4.A.01.02: Assess interest areas to determine potential career pathways, including career ladders. VIT.VISSN.4.A.01.08: Demonstrate employability skills needed to get and keep a job. VIT.VISSN.4.A.04: Demonstrate positive work behaviors. VIT.VISSN.4.A.04.01: Identify time management and task prioritization skills. VIT.VISSN.4.A.04.02: Explain the importance of following workplace etiquette/protocol. VIT.VISSN.4.A.04.03: Demonstrate willingness to learn and further develop skills. VIT.VISSN.4.A.04.04: Demonstrate self-management skills. VIT.VISSN.4.A.04.05: List causes of stress and effective stress management techniques. VIT.VISSN.4.A.04.06: Describe the importance of having a positive attitude and techniques that boost morale. VIT.VISSN.4.A.04.07: Show initiative by coming up with unique solutions and taking on extra responsibilities. VIT.VISSN.4.A.04.08: Explain the importance of setting goals and demonstrate the ability to set, reach, and evaluate goals. VIT.VISSN.4.A.04.09: Explain the importance of taking pride in work

	2	Career Planning		accomplished and extrinsic and intrinsic motivators that can be used to increase pride. VIT.VISSN.4.A.04.10: Value the importance of professionalism, including reliability, honesty, responsibility, and ethics. VIT.VISSN.4.A.04.11: Demonstrate a respect for diversity and its benefit to the workplace. 4.A.03a Develop a career plan with alternatives.
2 – 3	1 1 1	General Industry Safety (OSHA) Startsafe. Staysafe • What is OSHA? • Describe why safety matters • Explain the CareerSafe StartSafe. StaySafe. Philosophy • Describe how to recognize and respond to hazards Fall Hazards • Describe OSHA's regulations that protect workers on elevated surfaces • List primary fall protection • Explain how guardrails help prevent falls • Explain guidelines for using safety nets • Identify components of personal fall arrest systems Personal Protective Equipment • Explain why PPE		VIT.VISSN.2.A.01: Demonstrate appropriate use of safety procedures and tools. VIT.VISSN.1.A.01: Define Health and Safety regulations. VIT.VISSN.1.A.01.01: Identify and apply Occupational Safety and Health Administration (OSHA) and other health and safety regulations that apply to specific tasks and jobs in the occupational area. VIT.VISSN.1.A.01.02: Identify and apply Environmental Protection Agency (EPA) and other environmental protection regulations that apply to specific tasks and jobs in the occupational area. VIT.VISSN.1.A.01.03: Identify and apply Right-To-Know (Hazard Communication Policy) and other communicative regulations that apply to specific tasks and jobs in the occupational area. VIT.VISSN.1.A.01.04: Explain procedures for documenting and reporting hazards to appropriate authorities. VIT.VISSN.1.A.01.05: List penalties for non-compliance with appropriate health and safety regulations. VIT.VISSN.1.A.01.06: Identify contact information for appropriate health and safety agencies and resources. VIT.VISSN.1.A.02: Demonstrate health and safety practices. VIT.VISSN.1.A.02.01: Identify, describe and demonstrate the effective use of Material Safety Data Sheets (MSDS). VIT.VISSN.1.A.02.02: Read chemical, product, and equipment labels to determine appropriate health and safety considerations. VIT.VISSN.1.A.02.03: Identify, describe and demonstrate personal, shop and job site safety practices and procedures.

	1 1 1	is important • List the different types of PPE • Recognize the situations in which different types of PPE should be used • Describe how to use the different types of PPE • List employer responsibilities toward affected employees Bloodborne Pathogens • Define the term "pathogen" • Identify hazards associated with bloodborne pathogens • Describe how bloodborne pathogens are transmitted • Understand who is at risk? • List ways to reduce your risk of exposure • Identify OSHA requirements pertaining to bloodborne pathogens Electrocution Hazards • Describe the types of injuries that can result from contact with electricity • Identify the warning signs that suggest an electrical hazard exists • List common electrical hazards found on the job • Identify methods to protect yourself		VIT.VISSN.1.A.02.04: Demonstrate safe dress and use of relevant safety gear and personal protective equipment (PPE), including (where appropriate) wrist rests, adjustable workspaces and equipment, gloves, boots, earplugs, eye protection, and breathing apparatus. VIT.VISSN.1.A.02.05: Demonstrate appropriate safe body mechanics, including proper lifting techniques and ergonomics. VIT.VISSN.1.A.02.06: Locate emergency equipment in your lab, shop, and classroom, including (where appropriate) eyewash stations, shower facilities, sinks, fire extinguishers, fire blankets, telephone, master power switches, and emergency exits. VIT.VISSN.1.A.02.07: Demonstrate the safe use, storage, and maintenance of every piece of equipment in the lab, shop, and classroom. VIT.VISSN.1.A.02.08: Describe safety practices and procedures to be followed when working with and around electricity. VIT.VISSN.1.A.02.09: Properly handle, store, dispose of, and recycle hazardous, flammable, and combustible materials. VIT.VISSN.1.A.02.10: Demonstrate proper workspace cleaning procedures. VIT.VISSN.1.A.03: Demonstrate responses to situations that threaten health and safety. VIT.VISSN.1.A.03.01: Describe First Aid procedures for potential injuries and other health concerns in the occupational area. VIT.VISSN.1.A.03.02: Describe the importance of emergency preparedness and an emergency action plan. VIT.VISSN.1.A.03.03: Describe procedures used to handle emergency situations and accidents, including identification, reporting, response, evacuation plans, and follow-up procedures. VIT.VISSN.1.A.03.04: Identify practices used to avoid accidents. VIT.VISSN.1.A.03.05: Identify and describe fire protection, precautions and response procedures. VIT.VISSN.1.A.03.06: Discuss the role of the individual and the company/organization in ensuring workplace safety. VIT.VISSN.1.A.03.07: Discuss ways to identify and prevent workplace/school violence. VIT.VISSN.2.A.01.04: Implement personal safety and Occupational Safety and Health Administration (OSHA) guidelines. VIT.VISSN.2.A.02: Describe environmental

	1 1 1 1	and others against electrical hazards Hazard Communication • Explain the importance of chemical safety • Describe the basics of chemical safety • Describe the "Right-to-Know" Law • Identify the requirements of a Hazard Communication Program • Explain the purpose of Material Safety Data Sheets • Recognize different types of warning labels Ergonomics Emergency Action Planning Preventing Workplace Violence Safety Project • Review und update all components of the Shop Safety Plan and SDS Documentation		impacts and the purpose of environmental controls. VIT.VISSN.2.A.02.01: Use Material Safety Data Sheet (MSDS) and manufacturer's recommendations for handling, protection and disposal of components and materials. VIT.VISSN.2.A.02.02: Monitor temperature, humidity level awareness and proper ventilation. VIT.VISSN.2.A.02.03: Identify devices and procedures to protect against power surges, brownouts, blackouts. VIT.VISSN.2.A.02.04: Demonstrate protection from airborne particles, dust and debris. VIT.VISSN.6.A.03.04: Evaluate school and work environments in terms of ergonomic practices.
4-5	3	Digital Number Systems • How are numbers stored in computer systems? • What are the common number systems associated with computers?		3.C.28c Explain the differences between analog and digital information and the use of binary numbers in data storage.

	5 2	• Convert Decimal, hexadecimal and Binary Numbers Exploring The Network ▪ Explain how multiple networks are used in everyday life. ▪ Explain the topologies and devices used in a small-to-medium-sized business network. ▪ Explain the basic characteristics of a network that supports communication in a small-to-medium-sized business. ▪ Explain trends in networking that will affect the use of networks in small-to-medium-sized businesses. OSI & TCP/IP Models • Demonstrate knowledge of the OSI Seven-Layer Model and TCP/IP Models	Chapter 1- Exploring the Network	VIT.VISSN.2.J.04.04 Compare and contrast physical vs. logical topologies. **VIT.VISSN.2.J.04.05 Describe ring, bus, star, extended star and mesh topologies.** VIT.VISSN.2.I.07 Explain the purpose and properties of routing and switching. VIT.VISSN.2.J.05: Compare and contrast network devices, their functions and their features. VIT.VISSN.2.J.05.01 Differentiate the functionality of hubs, switches, bridges, routers, access points, and modems. 2.P.05 Describe various telecom considerations and processes including convergence, and Voice Over IP. VIT.VISSN.2.I.01: Compare the layers of the Open Systems Interconnection (OSI) and Transmission Control Protocol/Internet Protocol (TCP/IP) models. VIT.VISSN.2.I.01.01: Define the purpose of networking models. VIT.VISSN.2.I.01.02: Identify the layers of the OSI model. VIT.VISSN.2.I.01.03: Identify the layers of the TCP/IP model (i.e., Network Interface Layer, Internet Layer, Transport Layer, and Application Layer). VIT.VISSN.2.I.02: Apply the OSI model. VIT.VISSN.2.I.02.01: Classify the differences between Layer 1, Layer 2, and Layer 3 applications, devices, and protocols as they relate to the OSI model layers. 2.R.07 Differentiate between a switch and a router. 2.R.08 Identify hardware needed to connect switch/router to a network. 2.R.09 Describe the use of functions of a switch/router.

				2.R.10 Demonstrate procedures used to communicate with a switch/router. 2.R.01 Configure a NIC.
5-6		Network Configuration ▪ Explain the purpose of the Cisco IOS. ▪ Explain how to access and navigate the Cisco IOS to configure network devices. ▪ Describe the command structure of the Cisco IOS software. ▪ Configure hostnames on a Cisco IOS device using the CLI. ▪ Use Cisco IOS commands to limit access to device configurations. ▪ Use Cisco IOS commands to save the running configuration. ▪ Explain how devices communicate across network media. ▪ Configure a host device with an IP address. ▪ Verify connectivity	Chapter 2 – Configuring a Network Operating System	. 2.C.07c Open, and communicate over, an internet connection. 2.R.11 Demonstrate procedures used to configure a switch/router. 2.R.12 Demonstrate procedures used to install a switch/router. VIT.VISSN.2.J.04.06 Describe Peer-to-peer, Client-server, Hybrid, Point to point, Point to multipoint and MPLS topologies **Advanced** Access and utilize the router command line interface (CLI) to set basic parameters. VIT.VISSN.2.R.02.06: **Advanced** Connect, configure, and verify operation status of a device interface. VIT.VISSN.2.R.02.07:

		between two end devices.		
7-9		Network Protocols and Standards ▪ Explain how rules are used to facilitate communication. ▪ Explain the role of protocols and standards organizations in facilitating interoperability in network communications. ▪ Explain how devices on a LAN access resources in a small to medium-sized business network.	Chapter 3- Network Protocols and Communications	VIT.VISSN.2.I.06 Explain the function of common networking protocols, associated port numbers and their purpose. VIT.VISSN.2.I.06.02 Define common network protocols. VIT.VISSN.2.I.07.01 Differentiate between Interior Gateway Protocol (IGP) and Exterior Gateway Protocol (EGP) VIT.VISSN.2.I.07.02 Compare routing protocols (i.e., link state vs. distance vector vs. hybrid, static vs. dynamic, routing metrics, next hop). .
		End Term 1		
10-12	15	Layer 1 – Media Access ▪ Identify device connectivity options. ▪ Describe the purpose and functions of the physical layer in the network. ▪ Describe basic principles of the physical layer standards. ▪ Identify the basic characteristics of	Chapter 4 – Network Access	VIT.VISSN.2.J.01 Describe the characteristics of network cables and associated connectors; prepare and install network cabling. VIT.VISSN.2.J.01.01 Identify fiber cable and connector types. VIT.VISSN.2.J.01.02 Identify copper cable types (Twisted Pair and Coaxial) and associated connector types. VIT.VISSN.2.J.01.03 Compare the speed and transmission limitations of various network cables. VIT.VISSN.2.J.01.04 Describe plenum and non-plenum ratings and the use of broadband over power lines. VIT.VISSN.2.J.01.05 Install and terminate network cabling. VIT.VISSN.2.J.02 Identify components of wiring distribution and management. VIT.VISSN.2.J.02.01 Define and

		copper cabling. ▪ Build a UTP cable used in Ethernet networks. ▪ Describe fiber-optic cabling and its main advantages over other media. ▪ Describe wireless media. ▪ Select the appropriate media for a given requirement and connect devices.		describe IDF, MDF, Demarc and CSU/DSU. VIT.VISSN.2.I.03: Explain the purpose and properties of IP Addressing. VIT.VISSN.2.I.03.01: Identify the Classes of addresses. VIT.VISSN.2.I.05 Explain Domain Name System (DNS) concepts, describe its components and install DNS servers. VIT.VISSN.2.I.05.01 Evaluate DNS servers, DNS records and Dynamic DNS. VIT.VISSN.2.I.05.02 Explain client side DNS. VIT.VISSN.2.J.02.02 Explain the purpose of cable management. VIT.VISSN.2.J.02.03 Explain the value of network maps and documented wiring schematics. VIT.VISSN.2.J.03 Compare and contrast internet connection types and features. VIT.VISSN.2.J.03.01 Identify properties of common SOHO Internet connection types (Cable, DSL, Dial-up, Fiber, and Satellite). VIT.VISSN.2.J.03.02 Identify properties of typical business Internet connection types (ISDN, Frame Relay, ATM, T1, T3, DS3, Sonnet Ocx). VIT.VISSN.2.J.03.03 Differentiate among wireless Internet connection types (Cellular/mobile hot spot, line of sight wireless internet service, WiMAX). VIT.VISSN.2.R.02.03:**Advanced** Select the appropriate media, cables, ports, and connectors to connect routers to other network devices and hosts. 3.C.14.c Explain how information travels through different media, e.g., electrical wire, optical fiber, air, space. 3.C.22c Distinguish between mechanical and electromagnetic waves.
13-14	10	Ethernet ▪ Describe the operation of the Ethernet sublayers. ▪ Identify the major fields of the	Chapter 5 - Ethernet	VIT.VISSN.2.J.04.02 Explain the Ethernet 802.3 standards. VIT.VISSN.2.J.04.03 Describe CSMA/CD and CSMA/CA. **Advanced** Explain the technology and media access control method for Ethernet technologies. VIT.VISSN.2.R.02.13: **Advanced**

		Ethernet frame. ▪ Describe the purpose and characteristics of the Ethernet MAC address. ▪ Describe the purpose of ARP. ▪ Explain how ARP requests impact network and host performance. ▪ Explain basic switching concepts. ▪ Compare fixed configuration and modular switches. ▪ Configure a Layer 3 switch.		Verify network status and switch operation using basic utilities (including: ping, traceroute, telnet, SSH, arp, ipconfig), SHOW & DEBUG commands VIT.VISSN.2.S.04.01: **Advanced** Indicate advantages and disadvantages of different storage technologies; local (SATA, SCSI, IDE); NAS; SAN; fiber channel; iSCSI; NFS; FC HBA and FC switches; iSCSI hardware. VIT.VISSN.2.I.07.05 State the function of routing and switching tables.
15-17	5	Online Research, Preparing and Presenting Technical Documentation		2.M Prepare and present documentation VIT.VISSN.4.A.02.02: Apply reading skills and strategies to work-related documents. VIT.VISSN.4.A.02.03: Locate information from books, journals, magazines, and the Internet. VIT.VISSN.4.A.02.04: Apply basic writing skills to work-related communication. VIT.VISSN.4.A.02.05: Write work-related materials. VIT.VISSN.4.A.02.06: Explain information presented graphically. VIT.VISSN.4.A.02.07: Use writing / publishing / presentation applications. VIT.VISSN.4.A.02.08: Apply basic skills for work-related oral communication. VIT.VISSN.4.A.03.05: Select potential solutions based on reasoned criteria. VIT.VISSN.4.A.03.06: Implement and evaluate solution(s). VIT.VISSN.6.A.01.11: Use search engines and online directories. VIT.VISSN.6.A.01.12: Explain the differences among various search engines and how they rank results.

				VIT.VISSN.6.A.01.13: Explain and demonstrate effective search strategies for locating and retrieving electronic information (e.g., using syntax and Boolean logic operators). VIT.VISSN.6.A.02.03: Explain laws restricting the use of copyrighted materials. VIT.VISSN.6.A.02.04: Identify examples of plagiarism, and discuss the possible consequences of plagiarizing the work of others. VIT.VISSN.6.A.03: Design and implement a personal learning plan that includes the use of technology to support lifelong learning goals. VIT.VISSN.6.A.03.01: Evaluate the authenticity, accuracy, appropriateness, and bias of electronic resources, including Web sites. VIT.VISSN.6.A.03.02: Analyze the values and points of view that are presented in media messages. VIT.VISSN.6.A.04: Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity, and innovation. VIT.VISSN.6.A.04.01: Devise and demonstrate strategies for efficiently collecting and organizing information from electronic sources. VIT.VISSN.6.A.04.02: Compare, evaluate, and select appropriate electronic resources to locate specific information VIT.VISSN.6.A.04.03: Select the most appropriate search engines and directories for specific research tasks.
	10	Network Layer ▪ Explain how network layer protocols and services support communications across data networks. ▪ Explain how routers enable end-to-end connectivity in a small to medium-sized business	Chapter 6 – Network Layer	VIT.VISSN.2.R.02: **Advanced** Implement a routed network. VIT.VISSN.2.R.02.01: **Advanced** Describe basic routing concepts (including: packet forwarding, router lookup process). VIT.VISSN.2.R.02.02: **Advanced** Describe the operation of routers (including: router bootup process, POST, router components). VIT.VISSN.2.R.02.03:**Advanced** Select the appropriate media, cables, ports, and connectors to connect routers to other network devices and

		network. ▪ Determine the appropriate device to route traffic in a small to medium-sized business network. ▪ Configure a router with basic configurations.		hosts.
18		Mid Year Exams	Ch 1-6	
		End Term 2		
19-21	15	Transport Layer ▪ Describe the purpose of the transport layer in managing the transportation of data in end-to-end communication. ▪ Describe characteristics of the TCP and UDP protocols, including port numbers and their uses. ▪ Explain how TCP session establishment and termination processes facilitate reliable communication. ▪ Explain how TCP protocol data units are transmitted and acknowledged to guarantee delivery. ▪ Explain the UDP client processes to	Chapter 7 – Transport Layer	VIT.VISSN.2.I.06.01 Identify common Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) default ports.

		establish communication with a server. ▪ Determine whether high-reliability TCP transmissions, or non-guaranteed UDP transmissions, are best suited for common applications.		
22-24	10	In Depth TCP/IP Networking ▪ Describe the structure of an IPv4 address. ▪ Describe the purpose of the subnet mask. ▪ Compare the characteristics and uses of the unicast, broadcast, and multicast IPv4 addresses. ▪ Compare the use of public address space and private address space. ▪ Explain the need for IPv6 addressing. ▪ Describe the representation of an IPv6 address. ▪ Describe types of IPv6 network addresses.	Chapter 8 – IP Addressing	VIT.VISSN.2.I.03.02: Describe Classless Inter-Domain Routing (CIDR). VIT.VISSN.2.I.03.03: Describe the differences between Internet Protocol version 4 (IPv4) vs. Internet Protocol version 6 (IPv6). VIT.VISSN.2.I.03.04: Distinguish differences between static and dynamic addressing. VIT.VISSN.2.I.03.05: Distinguish differences between public and private addressing. VIT.VISSN.2.I.03.06: Explain the components of the TCP/IP protocol including IP, subnet mask and default gateway. VIT.VISSN.2.I.03.07: Describe and prepare a subnet. VIT.VISSN.2.I.03.08: Differentiate among multicast, unicast and broadcast. VIT.VISSN.2.I.03.09: Detect Automatic Private IP Addressing (APIPA).

		▪ Configure global unicast addresses. ▪ Describe multicast addresses. ▪ Describe the role of ICMP in an IP network. (Include IPv4 and IPv6.) ▪ Use ping and traceroute utilities to test network connectivity. Group Network OS Installation Project		VIT.VISSN.2.K.01: Install and configure network operating systems. VIT.VISSN.2.K.01.01: Identify common network operating systems. VIT.VISSN.2.K.01.02: Install a network operating system. VIT.VISSN.2.K.01.03: Configure a server. VIT.VISSN.2.S.06.03: **Advanced** Manage server updates.including but not limited to, printer pools; web printing; web management; driver deployment; file, folder and share permissions vs. rights; auditing; print job management. VIT.VISSN.2.S.03: **Advanced** Manage active directory. VIT.VISSN.2.S.03.01: **Advanced** Create accounts and groups. VIT.VISSN.2.S.03.02: **Advanced** Structure organizational units and containers. VIT.VISSN.2.S.03.03: **Advanced** Describe active directory infrastructure including but not limited to domain controllers, forests, operation master VIT.VISSN.4.A.02.10: Lead formal and informal group discussions. VIT.VISSN.4.A.02.11: Demonstrate effective negotiation and conflict management. VIT.VISSN.4.A.02.12: Apply active listening skills to obtain and clarify information. VIT.VISSN.4.A.02.13: Communicate with others in a diverse workforce. VIT.VISSN.4.A.03: Solve problems using critical thinking. VIT.VISSN.4.A.03.01: Demonstrate skills used to define and analyze a given problem.

				VIT.VISSN.4.A.03.02: Explain the importance and dynamics of individual and teamwork approaches of problem solving. VIT.VISSN.4.A.03.03: Describe methods of researching and validating reliable information relevant to the problem. VIT.VISSN.4.A.03.04: Explain strategies used to formulate ideas, proposals and solutions to problems. VIT.VISSN.6.A.04.06: Use online communication tools to collaborate with peers, community members, and field experts as appropriate (e.g., bulletin boards, discussion forums, listserve, Web conferencing. VIT.VISSN.6.A.04.07: Plan and implement a collaborative project with students in other classrooms and schools using telecommunications tools (e.g., e-mail, discussion forums, groupware, interactive Web sites, video conferencing). VIT.VISSN.2.S.05: **Advanced** Manage server performance. VIT.VISSN.2.S.05.01: **Advanced** Distinguish among major server hardware components. VIT.VISSN.2.S.05.02: **Advanced** Explain performance monitoring (methodology; procedures; effect of network, CPU memory and disk; creating a baseline; perfmon; resmon; task manager; performance counters). VIT.VISSN.2.S.05.03: **Advanced** Explain logs and alerts. VIT.VISSN.2.S.06: **Advanced** Perform server maintenance. VIT.VISSN.2.S.06.01: **Advanced** Identify the steps in the server startup process. VIT.VISSN.2.S.01: **Advanced** Install and manage servers. VIT.VISSN.2.S.01.01: **Advanced** Manage device drivers, including but not limited to, installation; removal; disabling; update/upgrade; rollback; troubleshooting; Plug & Play; IRQ; interrupts; driver signing. VIT.VISSN.2.S.01.02: **Advanced** Manage services including, but not limited to, what services are; which state a service can be in; startup types; recovery options; delayed startup; Run As settings for a service; stopping or pausing a service; service accounts, dependencies. VIT.VISSN.2.S.01.03: **Advanced** Perform various server installations, including but not limited to, choosing correct OS version; partitioning; F8 options; server core vs. full; interactive install; unattended install; automated

				install using WDS; upgrade vs. clean install; firmware updates including BIOS VIT.VISSN.2.S.02: **Advanced** Implement server roles. VIT.VISSN.2.S.02.01: **Advanced** Prepare various types of application servers including, but not limited to, mail servers; database servers; collaboration servers; monitoring servers; threat management. VIT.VISSN.2.S.02.02: **Advanced** Configure web services, including but not limited to, IIS, WWW, FTP, separate worker processes, adding components, sites, ports, SSL and certificates. VIT.VISSN.2.S.02.03: **Advanced** Utilize remote access, including but not limited to, remote assistance, remote administration tools, remote desktop services, licensing, remote desktop gateway, VPN, application virtualization, multiple ports. VIT.VISSN.2.S.02.04: **Advanced** Configure file and print services, roles, domain vs. workgroup, child domains, trusts, functional levels, namespace, sites, and replication. VIT.VISSN.2.S.03.04: **Advanced** Implement group policy. VIT.VISSN.2.S.04: **Advanced** Identify storage technologies.
25-27	10	Subnetting ▪ Explain why routing is necessary for hosts on different networks to communicate. ▪ Describe IP as a communication protocol used to identify a single device on a network. ▪ Given a network and a subnet mask, calculate the number of host addresses available. ▪ Calculate the	Chapter 9 – Subnetting IP Networks	VIT.VISSN.2.I.03.07: Describe and prepare a subnet.

		necessary subnet mask in order to accommodate the requirements of a network. ▪ Describe the benefits of variable length subnet masking (VLSM). ▪ Explain how IPv6 address assignments are implemented in a business network.		
	1	Voice Over IP		VIT.VISSN.2.J.05.02 Explain the function of firewalls, network access server (NAS) and Voice over Internet Protocol (VoIP) phones.
	2	Wireless Networking • Explin the common wireless networking standards		VIT.VISSN.2.I.09 Compare and contrast wireless networking standards and encryption types. VIT.VISSN.2.I.09.01 Categorize wireless standards 802.11 a/b/g/n speeds, distances and frequencies. VIT.VISSN.2.I.09.02 Describe various wireless encryption types.
	2	Network Virtualization		VIT.VISSN.2.I.08.01 Identify and describe virtual switches, virtual desktops, virtual servers, virtual private branch exchange (PBX). VIT.VISSN.2.I.08.02 Compare onsite vs. offsite virtualization.
		End Term 3		
28-30		Application Layer ▪ Explain how the functions of the application layer, session layer, and presentation layer work together to provide network services to end	Chapter 10 – Application Layer	

		user applications. ▪ Describe how common application layer protocols interact with end user applications. ▪ Describe, at a high level, common application layer protocols that provide Internet services to end-users, including WWW services and email. ▪ Describe application layer protocols that provide IP addressing services, including DNS and DHCP. ▪ Describe the features and operation of well-known application layer protocols that allow for file sharing services, including FTP, File Sharing Services, SMB protocol, ▪ Explain how data is moved across the network, from opening an application, to receiving data.		
30-33	10	Network Design ▪ Identify the	Chapter 11 – It's a Network	VIT.VISSN.2.K.02: Plan a basic SOHO network. VIT.VISSN.2.K.02.01: Create a list of

		devices and protocols used in a small network ▪ Explain how a small network serves as the basis of larger networks. ▪ Describe the need for basic security measures on network devices. ▪ Identify security vulnerabilities and general mitigation techniques. ▪ Configure network devices with device hardening features to mitigate security threats. ▪ Use the output of ping and trace commands to establish relative network performance.		hardware, software and infrastructure requirements for implementation. VIT.VISSN.2.K.02.02: Review environment and equipment limitations and system compatibility requirements. VIT.VISSN.2.K.02.03: Determine equipment placement. VIT.VISSN.2.K.02.04: Illustrate the network. VIT.VISSN.2.K.03: Install, configure, and deploy a secure SOHO wireless/wired network using best practices. VIT.VISSN.2.K.03.01: Access and configure wireless/wired ISR for a basic SOHO network. VIT.VISSN.2.K.03.02: Configure options for MAC filtering, port forwarding/triggering, Service Set Identifier (SSID) broadcast, and wireless encryption. VIT.VISSN.2.K.03.03: Enable/disable services such as firewall, DHCP, DMZ, NAT, & WPS. VIT.VISSN.2.K.03.04: Disable unused ports.
	10	Network Security		VIT.VISSN.2.G.01: Describe common prevention methods. VIT.VISSN.2.G.01.01: Describe physical and digital security techniques. VIT.VISSN.2.G.01.02: Explain user education and the principle of least privilege. VIT.VISSN.2.G.02: Compare and contrast common security threats. VIT.VISSN.2.G.02.01: Differentiate between social engineering, malware, rootkits, phishing, shoulder surfing, spyware and viruses. VIT.VISSN.2.G.03: Implement best practices to secure a workstation. VIT.VISSN.2.G.03.01: Create a strong password policy. VIT.VISSN.2.G.03.02: Change or disable default user names, accounts and auto-run.

				VIT.VISSN.2.G.04: Describe appropriate data destruction/disposal methods. VIT.VISSN.2.G.04.01: Compare low level format vs. standard format. VIT.VISSN.2.G.04.02: Explain hard drive sanitation methods and physical destruction. VIT.VISSN.2.G.05 Evaluate the methods of network access security. VIT.VISSN.2.G.05.01: Summarize the purpose of access control lists (ACLs), port filtering, tunneling and encryption. VIT.VISSN.2.G.05.02: Describe site-to-site, client-to-site, and remote access methods. VIT.VISSN.2.G.06 Explain current network user authentication methods. VIT.VISSN.2.G.06.01: Test network client authentication. VIT.VISSN.2.G.07: Explain common threats, vulnerabilities, and mitigation techniques. VIT.VISSN.2.G.07.01: Define common threats and attacks. VIT.VISSN.2.G.07.02: Examine mitigation techniques. VIT.VISSN.2.G.08: Review firewall options. VIT.VISSN.2.G.08.01: Differentiate among the types of firewalls. VIT.VISSN.2.G.08.02: Describe implementation of firewall rules. VIT.VISSN.2.G.08.03: Define key tools such as port security, network address translation (NAT)/PAT, demilitarized zone (DMZ). VIT.VISSN.2.G.08.04: Compare stateful inspection vs. packet filtering. VIT.VISSN.2.G.08.05: Plan and install a firewall solution. VIT.VISSN.2.G.09: Categorize different types of network security appliances and methods. VIT.VISSN.2.G.09.01: Explain the function of intrusion detection system (IDS), intrusion prevention system (IPS) and Vulnerability Scanners. VIT.VISSN.2.A.04: Describe fundamentals of dealing with prohibited content/activity. VIT.VISSN.2.A.04.01: Outline steps of first response identification, reporting and data preservation. VIT.VISSN.2.A.04.02: Explain use of documentation/documentation changes. VIT.VISSN.2.A.04.03: Describe the chain of custody process with regards to managing evidence.
34		Online Research, Preparing and Presenting Technical		2.M Prepare and present documentation VIT.VISSN.4.A.02.02: Apply reading skills

		Documentation		and strategies to work-related documents. VIT.VISSN.4.A.02.03: Locate information from books, journals, magazines, and the Internet. VIT.VISSN.4.A.02.04: Apply basic writing skills to work-related communication. VIT.VISSN.4.A.02.05: Write work-related materials. VIT.VISSN.4.A.02.06: Explain information presented graphically. VIT.VISSN.4.A.02.07: Use writing / publishing / presentation applications. VIT.VISSN.4.A.02.08: Apply basic skills for work-related oral communication. VIT.VISSN.4.A.03.05: Select potential solutions based on reasoned criteria. VIT.VISSN.4.A.03.06: Implement and evaluate solution(s). VIT.VISSN.6.A.01.11: Use search engines and online directories. VIT.VISSN.6.A.01.12: Explain the differences among various search engines and how they rank results. VIT.VISSN.6.A.01.13: Explain and demonstrate effective search strategies for locating and retrieving electronic information (e.g., using syntax and Boolean logic operators). VIT.VISSN.6.A.02.03: Explain laws restricting the use of copyrighted materials. VIT.VISSN.6.A.02.04: Identify examples of plagiarism, and discuss the possible consequences of plagiarizing the work of others. VIT.VISSN.6.A.03: Design and implement a personal learning plan that includes the use of technology to support lifelong learning goals. VIT.VISSN.6.A.03.01: Evaluate the authenticity, accuracy, appropriateness, and bias of electronic resources, including Web sites. VIT.VISSN.6.A.03.02: Analyze the values and points of view that are presented in media messages.
		Incorporate multi-media in presentations		2.E Utilize multimedia and graphic tools. VIT.VISSN.2.B.01.04: Illustrate uses of interactive media in society/industry. VIT.VISSN.2.O.01: Utilize multimedia and graphic tools. VIT.VISSN.2.O.01.01: Describe various interactive media tools. VIT.VISSN.2.O.01.02: Create and manipulate images using a graphic drawing/editing program.

				VIT.VISSN.2.O.01.03: Import and export graphics using external peripherals. VIT.VISSN.2.O.01.04: Differentiate between digital image, audio and video file formats. VIT.VISSN.2.O.01.05: Open, run and create video clips. VIT.VISSN.2.O.01.06: Play and record sound clips. VIT.VISSN.6.A.04.05: Demonstrate how the use of various techniques and effects (e.g., editing, music, color, rhetorical devices) can be used to convey meaning in media. VIT.VISSN.6.A.03.05: Describe and use safe and appropriate practices when participating in online communities (e.g., discussion groups, blogs, social networking sites). VIT.VISSN.6.A.04.04: Use a variety of media to present information for specific purposes (e.g., reports, research papers, presentations, newsletters, Web sites, podcasts, blogs), citing sources.
35		Project Presentations, Review		3.A.09c Deliver formal presentations for particular audiences using clear enunciation and appropriate organization, gestures, tone, and vocabulary.
36		Final Exams	Ch 7-11	
		End Term 4		

Information Technology 3

Course Number: 7327
Instructor/Teacher: Edward Holmes Room: C204 Phone: (617)-376-3310
Email: edwardholmes@quincypublicschools.com Course Level: Honors Point Value: 10

The contents of this syllabus support the Massachusetts DECE Vocational Technical Education Frameworks: Information Technology Services – Information Support Services and Networking. This Syllabus also supports curriculum to prepare students for CompTIA Network+ and/or CCENT/CCNA certification.

Course Description:

The last course in this series of three, students will focus on digital media, information systems and analysis, databases, computer programming and going beyond Desktop computing. Students advanced skills may be further developed through supervised internships. Resumes will be created and portfolios completed.

Texts/Instructional Materials:

Cisco Networking Academy – CCNA: Routing and Switching Essentials, Introduction to Cyber Security, Entrepreneurship
Schoology site for assignment submission
Class Web Site: http://infotech66.tripod.com

Supplemental Resources:
On-line activities and resources too numerous to list.
An Introduction to Programming with C++. 6th Ed. By Diane Zak
CCNA Guide to Cisco Networking. 4th Ed. By Kelly Cannon, Kelly Caudle, and Anthony Chiarella

Portfolios:

Students are required to keep a portfolio of their work. This is done in two ways. Students will keep a notebook of written projects, lab reports, observations, notes, and journal entries. For this students should have a standard three ring binder of approximately 2" or more. Secondly students will keep an electronic portfolio of their work. This information will be stored on a classroom public file server computer. Although not required, it is highly recommended that students have a USB flash memory device to securely back up files and make files available for homework assignments.

Assessment Methods:

Portfolios	Simulations	Essays
Teacher Observations	Open ended questions	Research papers
Oral presentations	Word problems	Presentations
Projects	Lab Experiments & Report s	Attendance
Notebooks	Multimedia presentations	Class Participation
Diagnostic testing	Objective Tests/Quizzes	Document Analysis
Oral Exams	Exams	Homework
Interdisciplinary activities	Mid-Year / Final Exam	Technical Projects

Grading Policy:

20% - Lab Projects/Class work
20% - Employability skills *
20% - Homework/Projects/Portfolio
20% - Quizzes/Tests
20% - Mid-Term/Final Exams

Students will be graded on a percentage basis according to the student handbook guidelines as follows:

99-97=A+
96-93=A
92-90=A-
89-87=B+
86-83=B
82-80=B-
79-77=C+
76-73=C
72-70=C-
69-67=D+
66-63=D (minimum passing)
Below 63 (failing)

Competency-based, hands-on type activities will be graded based on the level of proficiency of the task to be evaluated. A sample grading structure is as follows:

Grade	Performance Level
4 (A Level)	**Highly Proficient**: Can complete the skill quickly and accurately with initiative and can direct others in performing the skill.
3 (B Level)	**Competent**: Can do all parts of the task. Needs only a spot check of completed work and meets minimum entry level requirements for speed and accuracy.
2 (C Level)	**Partly Proficient**: Can perform the task satisfactorily, but requires periodic supervision and/or assistance and may not meet entry level requirements for speed and accuracy.
1 (D Level)	**Limited**: Can perform parts of the skill satisfactorily, but requires considerable assistance and supervision.
0 (Failing)	Not Competent: Cannot perform the skill satisfactorily without assistance.

Employability:

Employability is about being able to find and keep fulfilling work. There are several soft skills necessary to develop in order to be successful in any career. The National Association of Colleges and Employers lists these top 10 skills employers seek:

1. Communication Skills (Oral and Written)
2. Honesty/Integrity
3. Teamwork Skills
4. Strong Work Ethic
5. Analytical Skills
6. Flexibility/Adaptability
7. Interpersonal Skills
8. Motivation/Initiative
9. Computer Skills
10. Detail Oriented

General Class Guidelines:

HOMEWORK: Students can expect a significant amount of homework (reading, review questions, on-line research, etc.). Homework preparation is essential in order to keep "lecture" time brief and have more hands-on time. Homework will be graded and will be combined with the class portfolio to represent 20% of the class grade. In order to complete assignments students will be expected to have Internet access and an active e-mail account. Though a computer at home may make homework completion easier, this does not mean that a home computer is necessary. Students can access the Internet at the Quincy Public Library and other locations.

LATE ASSIGNMENTS: Homework and class assignments are expected to be completed on-time. Late assignments will generally not be accepted. In the event of an excused absence, homework due the day of the absence will be accepted on the first day the student returns to class following the absence. Homework assigned that day will be given one day for each day absent to make up the work. Note that this grace period does not apply to pre-assigned homework or assignments posted on the class Web site.

ATTENDANCE: Students are expected to be in class, on time, each class period. Class activities will begin promptly at the starting bell. Attendance is counted as an employability grade and is graded quarterly. Three unexcused tardies and/or dismissals will be counted as one unexcused absence.

Term Attendance	Points
Perfect Attendance	10
1 Absence	9
2-3 Absences	8
4-7 Absences	7
6 Absences	6
7 or More Absences*	0

* 7 or more unexcused absences constitute course failure for the term – See handbook for details. "Requirements for Vocational Technical Certification – All students who successfully complete their course of study will receive a High School Diploma and a Certificate of Technical Proficiency. Any student who misses more than 14 days due to absences, including suspensions, cannot accrue the necessary shop hours and related instruction to be eligible for a Technical Certificate" – QHS Student-Parent Handbook.

CLASS CUTS: Class Cuts are dealt with severely. If a student chooses to cut a class he/she will receive a "0" for any daily class grade given as well as any homework, assignment, quiz or test due during the class cut. Class cuts will also be factored into the Employability Skills grade in that employers want employees who will come to work. Lastly, per the student handbook, class cuts will be turned in to the student's dean who may apply additional consequences, and the cut will result in a 5 point deduction in class grade. See the student handbook for a complete schedule of grade reductions for class cuts.

TERM PROJECTS: As many as 4 major term projects will be assigned throughout the course. The bulk of these projects will be completed outside of class. Ample time will be given to complete the projects. Some projects will be individual efforts and some may be collaborative projects. Teams for collaborative work will be selected at random by Mr. Holmes.

FIELD TRIPS AND DISMISSALS: In order for students to be allowed to miss class for a school sponsored activity (field trips, sports, etc.) must be in good standing with a class average of 70 or higher. Students who are not in good standing (including but not limited to missing assignments, in danger of failing, and/or showing poor employability skills) will not be permitted to miss class. In such event the student's sign-out sheet will be marked to indicate that the student is not in good standing. Attending a school sponsored activity without prior approval will be deemed a class cut and will be handled accordingly.

Information Technology 3 Planned Course Schedule

Week	Days	Topics/Objectives	CCNA Routing and Switching Essentials	DESE – Information Support Services and Networking Frameworks Addressed *(Items in black indicate legacy, pre-2013, ISSN frameworks)* *(Items in red indicate frameworks addressed previously in current course or prior courses.)*
1	5	Class expectations, Introduction to Employability, Shop safety		VIT.VISSN.4.A.04.10: Value the importance of professionalism, including reliability, honesty, responsibility, and ethics. VIT.VISSN.4.A.01: Develop employability skills to secure and keep employment in chosen field. VIT.VISSN.4.A.01.01: Evaluate industries, organizations, and careers based on multiple sources of research and information. VIT.VISSN.4.A.01.02: Assess interest areas to determine potential career pathways, including career ladders. VIT.VISSN.4.A.01.08: Demonstrate employability skills needed to get and keep a job. VIT.VISSN.4.A.04: Demonstrate positive work behaviors. VIT.VISSN.4.A.04.01: Identify time management and task prioritization skills. VIT.VISSN.4.A.04.02: Explain the importance of following workplace etiquette/protocol. VIT.VISSN.4.A.04.03: Demonstrate willingness to learn and further develop skills. VIT.VISSN.4.A.04.04: Demonstrate self-management skills. VIT.VISSN.4.A.04.05: List causes of stress and effective stress management techniques. VIT.VISSN.4.A.04.06: Describe the importance of having a positive attitude and techniques that boost morale. VIT.VISSN.4.A.04.07: Show initiative by coming up with unique solutions and taking on extra responsibilities. VIT.VISSN.4.A.04.08: Explain the importance of setting goals and demonstrate the ability to set, reach, and evaluate goals. VIT.VISSN.4.A.04.09: Explain the importance of taking pride in work accomplished and extrinsic and intrinsic motivators that can be used to increase pride.

				VIT.VISSN.4.A.04.10: Value the importance of professionalism, including reliability, honesty, responsibility, and ethics. VIT.VISSN.4.A.04.11: Demonstrate a respect for diversity and its benefit to the workplace. VIT.VISSN.2.A.01: Demonstrate appropriate use of safety procedures and tools. 4.A.02a Assess interest areas to determine potential career pathways, including career ladders. 4.A.03a Develop a career plan with alternatives. 4.A.08a Demonstrate employability skills needed to get and keep a job.
2	5	General Industry Safety (OSHA)		VIT.VISSN.1.A.01.01: Identify and apply Occupational Safety and Health Administration (OSHA) and other health and safety regulations that apply to specific tasks and jobs in the occupational area. VIT.VISSN.1.A.01.02: Identify and apply Environmental Protection Agency (EPA) and other environmental protection regulations that apply to specific tasks and jobs in the occupational area. VIT.VISSN.1.A.01.03: Identify and apply Right-To-Know (Hazard Communication Policy) and other communicative regulations that apply to specific tasks and jobs in the occupational area. VIT.VISSN.1.A.01.04: Explain procedures for documenting and reporting hazards to appropriate authorities. VIT.VISSN.1.A.01.05: List penalties for non-compliance with appropriate health and safety regulations. VIT.VISSN.1.A.01.06: Identify contact information for appropriate health and safety agencies and resources. VIT.VISSN.1.A.02: Demonstrate health and safety practices. VIT.VISSN.1.A.02.01: Identify, describe and demonstrate the effective use of Material Safety Data Sheets (MSDS). VIT.VISSN.1.A.02.02: Read chemical, product, and equipment labels to determine appropriate health and safety considerations. VIT.VISSN.1.A.02.03: Identify, describe and demonstrate personal, shop and job site safety practices and procedures. VIT.VISSN.1.A.02.04: Demonstrate safe

				dress and use of relevant safety gear and personal protective equipment (PPE), including (where appropriate) wrist rests, adjustable workspaces and equipment, gloves, boots, earplugs, eye protection, and breathing apparatus. VIT.VISSN.1.A.02.05: Demonstrate appropriate safe body mechanics, including proper lifting techniques and ergonomics. VIT.VISSN.1.A.02.06: Locate emergency equipment in your lab, shop, and classroom, including (where appropriate) eyewash stations, shower facilities, sinks, fire extinguishers, fire blankets, telephone, master power switches, and emergency exits. VIT.VISSN.1.A.02.07: Demonstrate the safe use, storage, and maintenance of every piece of equipment in the lab, shop, and classroom. VIT.VISSN.1.A.02.08: Describe safety practices and procedures to be followed when working with and around electricity. VIT.VISSN.1.A.02.09: Properly handle, store, dispose of, and recycle hazardous, flammable, and combustible materials. VIT.VISSN.1.A.02.10: Demonstrate proper workspace cleaning procedures. VIT.VISSN.1.A.03: Demonstrate responses to situations that threaten health and safety. VIT.VISSN.1.A.03.01: Describe First Aid procedures for potential injuries and other health concerns in the occupational area. VIT.VISSN.1.A.03.02: Describe the importance of emergency preparedness and an emergency action plan. VIT.VISSN.1.A.03.03: Describe procedures used to handle emergency situations and accidents, including identification, reporting, response, evacuation plans, and follow-up procedures. VIT.VISSN.1.A.03.04: Identify practices used to avoid accidents. VIT.VISSN.1.A.03.05: Identify and describe fire protection, precautions and response procedures. VIT.VISSN.1.A.03.06: Discuss the role of the individual and the company/organization in ensuring workplace safety. VIT.VISSN.1.A.03.07: Discuss ways to identify and prevent workplace/school

				violence. VIT.VISSN.2.A.01.04: Implement personal safety and Occupational Safety and Health Administration (OSHA) guidelines. VIT.VISSN.2.A.02: Describe environmental impacts and the purpose of environmental controls. VIT.VISSN.2.A.02.01: Use Material Safety Data Sheet (MSDS) and manufacturer's recommendations for handling, protection and disposal of components and materials. VIT.VISSN.2.A.02.02: Monitor temperature, humidity level awareness and proper ventilation. VIT.VISSN.2.A.02.03: Identify devices and procedures to protect against power surges, brownouts, blackouts. VIT.VISSN.2.A.02.04: Demonstrate protection from airborne particles, dust and debris.
3	5	Introduction to Cyber Security The Cybersecurity Industry • Explain the importance of cybersecurity in the global economy • Explain why cybersecurity is a growing profession Malware and How to Protect Yourself • Explain the characteristics and operation of malware. • Explain how hackers use unsuspecting individuals to propagate malware Overview of Cybersecurity in Finance and Telecommunications • Explain why cybersecurity is critical to the banking industry • Explain why cybersecurity is		VIT.VISSN.6.A.02.02: Explain issues related to the responsible use of technology (e.g., privacy, security). VIT.VISSN.2.G.01.01: Describe physical and digital security techniques. VIT.VISSN.2.G.01.02: Explain user education and the principle of least privilege. VIT.VISSN.2.G.02: Compare and contrast common security threats. VIT.VISSN.2.G.02.01: Differentiate between social engineering, malware, rootkits, phishing, shoulder surfing, spyware and viruses. VIT.VISSN.2.G.03: Implement best practices to secure a workstation. VIT.VISSN.2.G.03.01: Create a strong password policy. VIT.VISSN.2.G.03.02: Change or disable default user names, accounts and auto-run. VIT.VISSN.2.G.04: Describe appropriate data destruction/disposal methods. VIT.VISSN.2.G.04.01: Compare low level format vs. standard format. VIT.VISSN.2.G.04.02: Explain hard drive sanitation methods and physical destruction

		critical to the telecommunications industry Cisco Security Solutions • Explain Cisco's approach to cybersecurity. • Explain the behavior-based approach to cybersecurity Defending Against Global Threats • Explain the characteristics of cyber warfare. • Explain how Cisco's Security Intelligence Operations (SIO) tracks and responds to a global threat Strategic and Architectural Cybersecurity Planning • Explain trends in the cyber threat landscape. • Explain the framework of the Enterprise Security Architecture Vulnerabilities and Solutions • Explain why cybersecurity is critical to the medical devices industry. Will Your Future Be in Cybersecurity? • Explain the opportunities for pursuing network security certifications		
4 – 5	10	Entrepreneurship Starting an Internet Café • Define common business		VIT.VISSN.5.A.01: Analyze basic business practices required to start and run a company / organization. VIT.VISSN.5.A.01.01: Define entrepreneurship.

		terminology • Identify and research a business opportunity • Explain the decision making process • Practice the decision making process • Work as part of a business team • Prepare a simplified business plan Making a Business Successful • Define common marketing terminology • Explain variances in sales and cost forecasting • Identify frequently used marketing and communication tools • Analyze research results • Explain the change process • Prepare a simplified growth plan Taking the Initiative • Use social media as a research, marketing, and sales tool • Transfer skills acquired through previous employment or education to new employment opportunities • Identify steps involved in establishing a consulting business • Fund and operate		VIT.VISSN.5.A.01.02: Describe the relationship between suppliers, producers, and consumers. VIT.VISSN.5.A.01.03: Compare and contrast types of businesses, including sole proprietorships, small businesses, companies, corporations, governmental agencies, and non-profit organizations. VIT.VISSN.5.A.01.04: Describe practices that ensure quality customer service. VIT.VISSN.5.A.01.05: Explain the value of competition in business/field. VIT.VISSN.5.A.02: Manage all resources related to a business/organization. VIT.VISSN.5.A.02.01: Identify a company's/organization's chain of command and organizational structure. VIT.VISSN.5.A.02.02: Define and demonstrate leadership and teamwork skills. VIT.VISSN.5.A.02.03: Explain ways a company or organization can market itself, including choosing a name, designing logos and promotional materials, advertising, and the importance of word-of-mouth. VIT.VISSN.5.A.02.04: Identify methods to track inventory, productivity, income, expenses, and personnel. VIT.VISSN.5.A.02.05: Explain the importance of written operating procedures and policies. VIT.VISSN.5.A.02.06: Identify professional organizations and their benefits. VIT.VISSN.5.A.02.07: Explain methods to effectively run a meeting. VIT.VISSN.5.A.03: Describe methods for managing, organizing, retrieving and reporting financial data. VIT.VISSN.5.A.03.01: Explain the role of small businesses in the economy. VIT.VISSN.5.A.03.02: Extract and extrapolate data from financial documents, such as a pay-stub, budget, tax statement, and financial report. VIT.VISSN.5.A.04: Apply labor and civil rights law and guidelines to business practice and decisions. VIT.VISSN.5.A.04.01: List federal and state mandated employee rights. VIT.VISSN.5.A.04.02: Describe proper working conditions for your industry. VIT.VISSN.5.A.04.03: Explain the role of labor organizations.

		a consulting business Enabling an E-Business • Identify how broadband applications can be used in business • Define a business problem • Identify, evaluate, and choose e-business solutions • Prepare an implementation plan • Evaluate a business using business metrics Providing Outsource Services • Define the role of a contractor Explain how a contractor builds relationships with other businesses • Develop contracts that define these relationships • Determine where to find companies that are looking for contractors • Explain how to contact potential customers Building a Contracting Business • Review current business commitments and resources • Identify needed resources • Define a business structure to organize and optimize resources • Develop ways to communicate within the business structure		VIT.VISSN.5.A.04.04: Discuss the importance of diversity and list methods of encouraging diversity in the workplace. VIT.VISSN.5.A.04.05: Describe standard forms of employment contracts applicable to your industry. VIT.VISSN.5.A.04.06: State the current minimum wage, as well as wages for common jobs found within the field. VIT.VISSN.5.A.04.07: List opportunities for continual professional development. VIT.VISSN.5.A.05: Evaluate the effects of community relations on companies and the industry. VIT.VISSN.5.A.05.01: Describe the role that the industry/organization plays in different communities. VIT.VISSN.5.A.05.02: Describe the role that community interests play in a company's/organization's decision-making process. VIT.VISSN.5.A.06: Apply legal requirements and ethical considerations to business practice and decisions. VIT.VISSN.5.A.06.01: Identify laws that regulate businesses/organizations in your field. VIT.VISSN.5.A.06.02: Define the requirements for and protections given by copyright and trademark law. VIT.VISSN.5.A.06.03: Define the impact of the Americans with Disabilities Act and other civil rights legislation on your business/organization, employees, and customers. VIT.VISSN.5.A.06.04: Define ethical business practices for your field. VIT.VISSN.5.A.06.05: Identify trade-specific practices that support clean energy technologies and encourage environmental sustainability.

		• Explain the importance of good financial management • Recognize expansion opportunities		
6	5	Introduction to Programming		VIT.VISSN.2.P.01 Explain the purpose and functions of computer programming. VIT.VISSN.2.P.01.01 Describe what a computer program is and how it runs. VIT.VISSN.2.P.01.02 Identify and list various types of current programming languages. VIT.VISSN.2.P.01.03 Explain the steps in a program life cycle. VIT.VISSN.2.P.01.04 Design a simple program for a specific application. VIT.VISSN.2.P.01.05 Create, test functionality, debug and document a simple computer program.
7-8	10	Switched Networks ▪ Describe convergence of data, voice, and video in the context of switched networks. ▪ Describe a switched network in a small-to-medium-sized business. ▪ Explain the process of frame forwarding in a switched network. ▪ Compare a collision domain to a broadcast domain.	Chapter 1 – Introduction to Switched Networks	2.P.05 Describe various telecom considerations and processes including convergence, and Voice Over IP. VIT.VISSN.2.I.07.04 Distinguish between a broadcast domain and a collision domain. VIT.VISSN.2.R.01: **Advanced** Implement a switched network. VIT.VISSN.2.R.01.01: **Advanced** Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts. VIT.VISSN.2.R.01.02: VIT.VISSN.2.R.01.03: **Advanced** Explain network segmentation and basic traffic management concepts. VIT.VISSN.2.R.01.04: **Advanced** Explain the operation of network switches and basic switching concepts. VIT.VISSN.2.R.01.05: **Advanced** Perform, save and verify initial switch configuration tasks including remote access management. VIT.VISSN.2.R.01.06: **Advanced** Verify network status and switch operation using basic utilities (including: ping, traceroute, telnet, SSH, arp, ipconfig), SHOW & DEBUG commands. VIT.VISSN.2.L.01 Identify components of network management. VIT.VISSN.2.L.01.01 Explain the purpose and features of various network

				appliances. VIT.VISSN.2.L.01.02 Explain the different methods and rationales for network performance optimization. VIT.VISSN.2.L.01.03 Explain the purpose of network monitoring resources to analyze traffic. VIT.VISSN.2.L.01.04 Describe the purpose and benefit of configuration management documentation.
9	5	Employment Readiness • How does one prepare and apply for a job? • Resume creation • Interviewing Skills		VIT.VISSN.4.A.01.04: Complete job applications and related employment documents (e.g. W-4). VIT.VISSN.4.A.01.05: Create professional cover letters, resumes, and portfolios in a variety of formats (print and electronic). VIT.VISSN.4.A.01.06: Apply job search skills to seek, evaluate, apply for, and accept employment. VIT.VISSN.4.A.01.07: Demonstrate good interviewing skills. VIT.VISSN.4.A.01.09: Assess alternative occupational choices (e.g. working conditions, benefits, and opportunities to change).
End Quarter 1				
10	5	Creating Web Pages with HTML		VIT.VISSN.2.Q.01: Explain the fundamentals of web page development. VIT.VISSN.2.Q.01.01: Describe the methods of creating web sites. VIT.VISSN.2.Q.01.02: Apply structural requirements (information architecture) for development of a web site. VIT.VISSN.2.Q.01.03: Create a web site, using web site design software or programming language. VIT.VISSN.2.Q.01.04: Apply web site design features. VIT.VISSN.2.Q.01.05: Create hyperlinks. VIT.VISSN.2.Q.01.06: Proofread, edit and test a web site. VIT.VISSN.2.Q.01.07: Explain and demonstrate publishing, updating and maintaining a web site. VIT.VISSN.2.Q.01.08: Describe methods for achieving web site recognition. VIT.VISSN.2.Q.01.09: Critique a web site according to accepted web site design principles.2.F Create HTML documents.
11-13	15	Basic Switching Concepts and Configuration ▪ Explain the advantages and	Chapter 2 - Basic Switching Concepts and Configuration	VIT.VISSN.2.R.02.04: **Advanced** Configure, verify, and troubleshoot RIPv2. VIT.VISSN.2.R.02.05:

		disadvantages of static routing. ▪ Configure initial settings on a Cisco switch. ▪ Configure switch ports to meet network requirements. ▪ Configure the management switch virtual interface. ▪ Describe basic security attacks in a switched environment. ▪ Describe security best practices in a switched environment. ▪ Configure the port security feature to restrict network access.		**Advanced** Enable NAT for a small network with a single ISP and connection using SDM and verify operation using CLI and ping. VIT.VISSN.2.R.02.08: **Advanced** Configure, verify and troubleshoot DHCP and DNS operation on a router (including: CLI/SDM). VIT.VISSN.2.R.02.09: **Advanced** Perform and verify routing configuration tasks for a static or default route given specific routing requirements. VIT.VISSN.2.R.02.10: **Advanced** Verify device configuration and network connectivity using common utilities. VIT.VISSN.2.R.02.11: **Advanced** Manage router operating system configuration files (including save, edit, upgrade, restore). VIT.VISSN.2.R.02.12: **Advanced** Implement password and physical security for a network router. VIT.VISSN.2.R.02.13: **Advanced** Verify network status and router operation using basic utilities (including: ping, traceroute, telnet, SSH, arp, ipconfig), SHOW & DEBUG commands. VIT.VISSN.2.R.03: **Advanced** Implement and verify WAN links. VIT.VISSN.2.R.03.01: **Advanced** Describe different methods for connecting to a WAN. VIT.VISSN.2.R.03.02: **Advanced** Configure and verify a basic WAN serial connection. VIT.VISSN.2.R.01.07: **Advanced** Implement and verify basic security for a switch (port security, deactivate ports). VIT.VISSN.2.R.01.08: **Advanced** Identify, prescribe, and resolve common switched network media issues, configuration issues, auto-negotiation, and switch hardware failures.
14	5	Databases		VIT.VISSN.6.A.01.07: Identify the use of database skills in various careers. VIT.VISSN.2.P.01.06 Describe and apply database concepts. VIT.VISSN.2.P.01.07 Give examples of database queries and data reports. VIT.VISSN.2.P.01.08 Create a custom database.
18	Mid Year			

	Exams			
End Quarter 2				
19-20	10	VLANs ▪ Explain the purpose of VLANs in a switched network. ▪ Analyze how a switch forwards frames-based on VLAN configuration in a multi-switched environment. ▪ Configure a switch port to be assigned to a VLAN based on requirements. ▪ Configure a trunk port on a LAN switch. ▪ Configure Dynamic Trunk Protocol (DTP). ▪ Troubleshoot VLAN and trunk configurations in a switched network. ▪ Configure security features to mitigate attacks in a VLAN-segmented environment. ▪ Explain security best practices for a VLAN-segmented environment.	Chapter 3 - VLANs	VIT.VISSN.2.I.07.03 Explain Spanning-Tree Protocol, Virtual Local Area Network (VLAN) and port mirroring and convergence (steady state) concepts. VIT.VISSN.2.S.02.05: **Advanced** Describe server virtualization modes; VHDs; virtual memory; virtual networks; snapshots and saved states; physical to virtual; virtual to physical. VIT.VISSN.2.I.08: Identify and describe virtual network components. VIT.VISSN.2.I.08.03 Install a virtual network.

21-22	10	Routing Concepts ▪ Describe the primary functions and features of a router. ▪ Connect devices for a small routed network. ▪ Using the CLI, configure a router to route between multiple directly connected networks. ▪ Explain the encapsulation and de-encapsulation process used by routers when switching packets between interfaces. ▪ Explain the path determination function of a router. ▪ Compare ways in which a router builds a routing table when operating in a small- to medium-sized business network. ▪ Explain routing table entries for directly connected networks. ▪ Explain how a router builds a routing table of directly connected	Chapter 4 – Routing Concepts	VIT.VISSN.2.F.03.04 Use OS command line tools. **Advanced** Access and utilize the router command line interface (CLI) VIT.VISSN.2.R.02.08: **Advanced** Configure, verify and troubleshoot DHCP and DNS operation on a router (including: CLI/SDM). VIT.VISSN.2.R.02.09: **Advanced** Perform and verify routing configuration tasks for a static or default route given specific routing requirements. VIT.VISSN.2.R.02.10: **Advanced** Verify device configuration and network connectivity using common utilities. VIT.VISSN.2.R.02.11: **Advanced** Manage router operating system configuration files (including save, edit, upgrade, restore). VIT.VISSN.2.R.02.12: **Advanced** Implement password and physical security for a network router. VIT.VISSN.2.R.02.13: **Advanced** Verify network status and router operation using basic utilities (including: ping, traceroute, telnet, SSH, arp, ipconfig), SHOW & DEBUG commands.

		networks.		
23-24	15	Inter-VLAN Routing ▪ Describe the three primary options for enabling inter-VLAN routing. ▪ Configure legacy inter-VLAN routing. ▪ Configure router-on-a-stick inter-VLAN routing. ▪ Troubleshoot common inter-VLAN configuration issues. ▪ Troubleshoot common IP addressing issues in an inter-VLAN routed environment. ▪ Configure inter-VLAN routing using Layer 3 switching. ▪ Troubleshoot inter-VLAN routing in a Layer 3 switched environment.	Chapter 5 – Inter-VLAN Routing	
25-26	12	Static Routing ▪ Explain the advantages and disadvantages of static routing. ▪ Explain the purpose of	Chapter 6 – Static Routing	

		different types of static routes. ▪ Configure IPv4 and IPv6 static routes by specifying a next-hop address. ▪ Configure an IPv4 and IPv6 default routes. ▪ Explain the use of legacy classful addressing. ▪ Explain the purpose of CIDR in replacing classful addressing. ▪ Design and implement a hierarchical addressing scheme. ▪ Configure an IPv4 and IPv6 summary network address to reduce the number of routing table updates. ▪ Configure a floating static route to provide a backup connection. ▪ Explain how a router processes packets when a static route is configured. ▪ Troubleshoot		

		common static and default route configuration issues.		
26-27	13	Routing Dynamically ▪ Demonstrate knowledge of dynamic routing protocols, including the benefits of using a dynamic routing protocol, how different routing protocols are classified, and the metrics routing protocols use to determine best path. ▪ Other topics covered in this chapter include the characteristics of dynamic routing protocols and how the various routing protocols differ. ▪ Network professionals must understand the different routing protocols available in order to make informed decisions about when to use static or dynamic routing. ▪ They also need to know which dynamic routing protocol is most	Chapter 7 – Routing Dynamically	

		appropriate in a particular network environment.		
End Quarter 3				
28	5	Single Area OSPF • Configure Single Area OSPF • Describe packets used to establish and maintain an OSPF connection • Configure an OSPF router ID • Explain how OSPF uses cost to determine best patrh	Chapter 8 – Single Area OSPF	
29	5	Chapter 9 – Access Control Lists ▪ Explain how ACLs are used to filter traffic. ▪ Compare standard and extended IPv4 ACLs. ▪ Explain how ACLs use wildcard masks. ▪ Explain the guidelines for creating ACLs. ▪ Explain the guidelines for placement of ACLs. ▪ Configure standard IPv4 ACLs to filter traffic according to networking requirements. ▪ Modify a standard	Chapter 9 – Access Control Lists	VIT.VISSN.2.G.05.01: Summarize the purpose of access control lists (ACLs), port filtering, tunneling and encryption.

		IPv4 ACL using sequence numbers. ▪ Configure a standard ACL to secure vty access. ▪ Explain the structure of an extended access control entry (ACE). ▪ Configure extended IPv4 ACLs to filter traffic according to networking requirements.		
30	5	DHCP ▪ Describe the operation of DHCPv4 in a small-to-medium-sized business network. ▪ Configure a router as a DHCPv4 server. ▪ Configure a router as a DHCPv4 client. ▪ Troubleshoot a DHCP configuration for IPv4 in a switched network. ▪ Explain the operation of DHCPv6. ▪ Configure a stateless DHCPv6	Chapter 10 - DHCP	VIT.VISSN.2.R.02.08: **Advanced** Configure, verify and troubleshoot DHCP and DNS operation on a router (including: CLI/SDM). VIT.VISSN.2.I.04: Explain Dynamic Host Configuration Protocol (DHCP) concepts, describe its components and configure DHCP service. VIT.VISSN.2.I.04.01: Explain DHCP client and server side elements (reservations, scopes, leases). VIT.VISSN.2.I.04.02: Configure DHCP service. VIT.VISSN.2.K.03.03: Enable/disable services such as firewall, DHCP, DMZ, NAT, & WPS. VIT.VISSN.2.G.08.03: Define key tools such as port security, network address translation (NAT)/PAT, demilitarized zone (DMZ).

		for a small-to-medium-sized business. ▪ Configure a stateful DHCPv6 for a small-to-medium-sized business. ▪ Troubleshoot a DHCP configuration for IPv6 in a switched network.		
31	5	Network Address Translation for IPv4 ▪ Describe NAT characteristics. ▪ Describe the benefits and drawbacks of NAT. ▪ Configure static NAT using the CLI. ▪ Configure dynamic NAT using the CLI. ▪ Configure PAT using the CLI. ▪ Configure port forwarding using the CLI. ▪ Configure NAT64. ▪ Use show commands to verify NAT operation.	Chapter 11 – Network Address Translation for IPv4	VIT.VISSN.2.K.03.03: Enable/disable services such as firewall, DHCP, DMZ, NAT, & WPS. **Advanced** Enable NAT for a small network with a single ISP and connection using SDM and verify operation using CLI and ping.

32	Final Exams		Grade of 85 or below	
End Quarter 4				

Sample Performance Rubrics

Product Test: Cat6 Cross-Over Cable

Student's Name: _____ Test Date: ____/____/____
Evaluator's Name: _____ Attempt No: _____

General Directions: The student is to create a Cat6 Ethernet "Cross-over" cable of approximately 6 feet in length. An acceptable cable will be of a length to allow connection of adjacent PCs and allow for connection and transfer of data between computers.
Scoring Expectations: This evaluation is to test **mastery** of the concept. Therefor the only acceptable score is 100%. All items in the Product Checklist below must be "YES" items for successful completion. This evaluation is a "Class Work/Lab" Assessment and will be graded with either a "YES" (100%) or "NO" (0%). Students may retake this test as needed.
Materials: All necessary cabling tools and supplies, two computers with Ethernet adapters.

Product Checklist	YES	NO
Is the cable cleanly cut to a usable length?		
Is the shielding stripped to be within the connector or boot at both ends of the cable?		
Are the wires ordered wires with crossed-over pairs (1-3 and 2-6)?		
Are the RJ45 Jack connectors firmly crimped on both ends of the cable?		
Are the cables able to connect two adjacent computers?		
Are both computers able to pass data to and from each other?		

Number of "YES" Items	
Test Grade	

Post Evaluation Comments:

Process Test: Testing the Personal Computer Power Supply

Student's Name: _____ Test Date: ____/____/____
Evaluator's Name: _____ Attempt No: _____

General Directions: Students will use a digital multi-meter to test the three power rails of a personal computer power supply and document the results on a PC Repair Situation Report.
Scoring Expectations: This evaluation is to test **mastery** of the concept. Therefor the only acceptable score is 100%. All items in the Process Task List below must be "YES" items for successful completion. This evaluation is a "Class Work/Lab" Assessment and will be graded with either a "YES" (100%) or "NO" (0%). Students may retake this test as needed.
Materials: Desk-top computer, PC hand tool kit, digital multi-meter (DMM), and situation report.

Process Task List (Did the student…)	YES	NO
Enter client, system, and service information on the Situation Report?		
Shut down the computer (if required) and remove the power cable?		
Remove necessary case screws and open the case /remove the side cover?		
Discharge static electricity through the case or wear an ESD wrist strap?		
Disconnect the power supply connectors to the motherboard?		
Jumper Pin 14 (which is the green wire) to any of the ground (all which have a black wire)?		
Connect test leads to the Volts/Ohms and Common terminals of the DMM?		
Reconnect the power cable to the power supply and turn on the PS switch?		
Set the meter to read DC Voltage?		
Measure voltage for the 3.3 Volt rail (orange wires)?		
Record measured readings on the Situation Report?		
Measure voltage for the 5 Volt rail (red wires)?		
Record measured readings on the Situation Report?		
Measure voltage for the 12 Volt rail (yellow wires)?		
Record measured readings on the Situation Report?		
Document power supply conclusions on the Situation Report?		
Remove power cable from the power supply?		
Remove the jumper from the power supply and reconnect the Motherboard connectors?		
Reconnect the power cable, turn on the PC and test the PC's operation?		
Close the case/reattach side covers?		

Number of "YES" Items	
Test Grade	[_] YES [_] NO

Information Technology Written Assignment Rubric

Assignment: Computer Security Plan

Your task is to develop a security plan for a friend's computer. Using the Internet, newspapers, magazines, and/or flyers research software and/or hardware devices you would select to properly secure a computer. Put together a paper that would indicate what components or software you chose and why (against what do these things protect?). The final page of your project should be a "Works Cited" page. Your citations should be in MLA style using parenthetical references in the paper. The expectation is that this project would be no less than 3 pages typed (Times New Roman or Calibri, 12, double spaced; not including resources list).

This assignment is worth 10 points and will use the following scoring rubric:

Technical Elements – 2 points

Did the written work meet the required elements including word/page count, reference citation format, font, spacing, margins, etc.?

English Language Mechanics – 2 Points

Did the written work meet standards of proper English mechanics including paragraph and sentence structure, flow, punctuation, etc.?

Content Accuracy and Continuity – 6 points

Did the written work completely and accurately cover the topic?

Did the work accurately suggest virus protection? – 2 Points

Did the work accurately suggest spyware protection? – 2 Points

Did the work accurately suggest a firewall? – 2 Points