NEW ZEALAND INSTITUTES OF TECHNOLOGY AND POLYTECHNIC QUALIFICATIONS IN INFORMATION & COMMUNICATIONS TECHNOLOGY

PRESCRIPTION: IE500 IT ESSENTIALS

AIM OF MODULE:	To provide students with the knowledge and skills required to install, configure and maintain all the standard technology involved with a personal computer, including the operating system, and to attach the computer to an existing network. Emphasis is placed on computer security, safety and environmental issues.
CREDITS:	14
STUDENT LEARNING HOURS:	140
CONTENT REVISED:	2008
PRESCRIPTION EXPIRY DATE:	Nov 2011
NOTE:	The content of this module is based on Cisco IT Essentials V4.0 course content and is intended to help prepare students for CompTIA's A+ certification examination.

Level and Assessment Schedule

TOPICS	Highest Skill Level R	C	A	P	Suggested Assessment Percentage
1. The Personal Computer (PC)		*			10
2. Lab Safety Procedures & Tool Use			*		5
3. Computer Assembly			*		20
4. Preventative Maintenance & Troubleshooting				*	5
5. Operating Systems				*	15
6. Laptops & Portable Devices			*		10
7. Printers & Scanners				*	10
8. Networks				*	10
9. Security		*			10
10. Call Centre Environment			*		5
					100

LEARNING OUTCOMES

The student will:

C	1.	Explain the purpose of the various internal components of a PC, describe their purpose and identify their characteristics
A	2.	Explain the purpose of safe working conditions and procedures, identify tools and software used with PCs and demonstrate their proper use
A	3.	Assemble a PC, identify the beep codes and describe the BIOS setup
P	4.	Explain the purpose of preventative maintenance, identify the steps in the troubleshooting process and troubleshoot
P	5.	Explain the purpose of operating systems, describe their characteristics, install, explore and troubleshoot operating systems, and install, navigate and uninstall an application
A	6.	Explain how to configure laptops and identify and describe laptop components, maintenance procedures and common problems and solutions
P	7.	Describe printer and scanner types and characteristics and install, configure and troubleshoot printers and scanners
P	8.	Explain the principles of networking, describe network types, topologies, architectures and protocols and install, configure and troubleshoot network devices
C	9.	Describe security threats, explain security requirements, and identify security procedures, common problems and solutions and preventative maintenance techniques
A	10.	Describe the call centre environment and technician responsibilities and practice call centre procedures, having regard to the aspects of correct ethical, legal, business and professional behaviour

CONTENT

1. The Personal Computer (PC)

- Explaining the purpose of the various internal components of a PC, describing their purpose and identifying their characteristics includes:
  - Explaining IT industry certifications, including A+ and EUCIP
  - Identifying the names, purposes and characteristics of;
    - Cases & power supplies
    - Internal components
    - Motherboards
    - CPUs
    - Cooling systems
    - ROM & RAM
    - Adapter cards
    - Storage drives
    - Internal cables, ports and external cables
    - Input & output devices

2. Lab Safety Procedures & Tool Use

- Explaining the purpose of safe working conditions and procedures, identifying tools and software used with PCs and demonstrating their proper use involves:

- Identifying safety procedures and potential hazards for users and technicians
- Identifying safety procedures to;
  - Protect equipment from damage and data from loss
  - Protect the environment from contamination
- Identifying hardware, software and organizational tools and their purpose
- Demonstrating proper use of;
  - An antistatic mat and wrist strap
  - Various hand tools
  - Cleaning materials

3. Computer Assembly

➢ Assembling a PC, identifying the beep codes and describing the BIOS setup includes:

- Opening the case and installing;
  - The power supply
  - Motherboard components including;
    - CPU and heat sink/fan assembly
    - RAM
  - Motherboard
  - Internal drives
  - Drives in external bays
  - Optical drive
  - Floppy drive
  - Adapter cards
  - NIC and wireless NIC
  - Video Adapter Card
- Connecting all internal cables, power cables and data cables
- Reattaching side panels and connecting external cables
- Booting the PC and identifying the beep codes

4. Preventative Maintenance & Troubleshooting

➢ Explaining the purpose of preventative maintenance, identifying the steps in the troubleshooting process and troubleshooting will involve:

- Explaining the purpose of data protection
- Gathering data from the customer and from the computer
- Verifying the obvious issues and trying quick solutions first
- Evaluating the problem and implementing the solution
- Closing with the customer

5. Operating Systems

➢ Explaining the purpose of operating systems, describing their characteristics, installing, exploring and troubleshooting operating systems and installing, navigating and uninstalling an application includes:

- Explaining operating system (OS) concepts
- Describing and comparing OS, including compatibilities and limitations

- Describing desktop and network operating systems and custom installation options
- Determining an appropriate OS based on customer needs
- Identifying applications and environments that are compatible with an OS
- Determining the minimum hardware requirements and compatibility with the OS platform
- Identifying the hard drive (HD) setup procedures, preparing the HD and installing the OS using the default settings
- Creating accounts
- Describing directory structures and the manipulation of OS files
- Navigating a Windows GUI including;
    - Manipulating desktop items
    - Exploring control panel applets and administrative tools
    - Installing, navigating and uninstalling an application
- Describing the upgrading of an OS
- Troubleshooting an OS and identifying common problems and solutions

6. Laptops & Portable Devices

➢ Configuring laptops and identifying and describing laptop components, maintenance procedures and common problems and solutions will be explained in terms of:

- Identifying some common uses of laptops and PDAs
- Describing the components found on the inside and outside of a laptop and on the docking station
- Comparing and contrasting laptops and desktops in terms of;
    - Components
    - Motherboards
    - Processors
    - Power management
    - Expansion capabilities
- Describing how to configure power settings and to safely install and remove laptop components
- Comparing different mobile phone standards
- Identifying;
    - common preventative maintenance techniques for laptops and portable devices
    - Appropriate cleaning procedures
    - Optimal operating environments
    - Common problems and solutions
- Troubleshooting laptops and portable devices

7. Printers & Scanners

➢ Describing printer and scanner types and characteristics and installing, configuring and troubleshooting printers and scanners will include:

- Describing the types of printers currently available including;
    - Laser
    - Impact
    - Inkjet

        - Solid-ink
        - Other types
    - Describing how to set up a printer and to install and update the device driver, firmware and RAM
    - Explaining how to power and connect the device using a local or network port
    - Identifying configuration options and default settings and how to optimise printer performance
    - Describing how to print a test page and to share a printer
    - Describing scanner types, resolution, interfaces, all-in-one devices, flatbed, handheld and drum scanners
    - Explaining how to power and connect a scanner and describing how to install and update the device driver
    - Identifying configuration options and default settings
    - Identifying and applying common preventative maintenance techniques for printers and scanners
    - Troubleshooting printers and scanners

8. Networks

- Explaining the principles of networking, describing network types, topologies, architectures and protocols and installing, configuring and troubleshooting network devices will include:
    - Describing a LAN, WAN and WLAN
    - Explaining peer-to-peer and client/server networks
    - Describing the basic networking concepts and technologies including;
        - Bandwidth and data transmission
        - IP addressing
        - DHCP and ICMP
        - Internet protocols and applications
    - Identifying the names, purposes, and characteristics of network devices and common network cables
    - Describing LAN topologies and architectures
    - Identifying standards organisations and explaining Ethernet in terms of cable and wireless standards
    - Defining and comparing the OSI and TCP/IP models
    - Installing or updating a NIC driver
    - Attaching a computer to an existing network
    - Describing the installation of a modem
    - Describing telephone technologies
    - Defining power line communication, broadband and VoIP
    - Identifying and applying common preventative maintenance techniques used for networks
    - Troubleshooting the network

9. Security

- Describing security threats, explaining security requirements, and identifying security procedures, common problems and solutions and preventative maintenance

techniques will involve:

- Defining:
  - Viruses, worms and Trojans
  - Adware, spyware and grayware
  - Spam and popup windows
- Explaining web security, denial of service, TCP/IP attacks and social engineering
- Explaining hardware deconstruction and recycling
- Explaining requirements for a local security policy and the tasks required to protect physical equipment
- Describing:
  - Ways to protect data
  - Wireless security techniques
- Explaining how to update signature files for anti-virus and anti-spyware software
- Explaining how to install operating systems service packs and security patches
- Trouble shooting security

10. Call Centre Environment

- Describing the call centre environment and technician responsibilities and practicing call centre procedures, having regard to the aspects of correct ethical, legal, business and professional behaviour will include:
  - Determining the customer's computer problem, displaying professional behaviour, and using proper netiquette
  - Implementing time and stress management techniques and observing SLAs
  - Describing level-one and level-two technician responsibilities

NOTES FOR TUTORS

A typical assessment strategy should include:

- practical skills tests
- laboratory exercises
- group activities
- progressive on-line tests (CISCO Web Portal)
- summative (final) on-line test (CISCO Web Portal)
- kinaesthetic activities

LEARNING RESOURCES

Resources

- Laboratory equipment, video tapes, Cisco multimedia resources, library and internet.
- Tool Kit
- Digital multimeter
- Engineering Journal
- Evaluation versions of Windows 2000 and XP

Reading/Reference List:

- CompTIA A+ Certification Exam Guide (6th Edition). Mike Myers, ISBN-13: 978-0-07-226312-1, McGraw-Hill Osborne

- IT Essentials: PC Hardware and Software Companion Guide (3rd Edition). David Anfinson & Kenneth Quamme. ISBN-13: 978-1-58713-199-8 Cisco Press (Published: Jan 15, 2008)

- IT Essentials: PC Hardware and Software Labs and Study Guide (3rd Edition). Patrick Regan. ISBN-13: 978-1-58713-198-1 (Published: Jan 16, 2008)