EUCIP
European Certification of
Informatics Professionals

EUCIP IT Administrator - Module 1
PC Hardware

Syllabus Version 3.0

Copyright © 2011 ECDL Foundation

All rights reserved. No part of this publication may be reproduced in any form except as permitted by ECDL Foundation. Enquiries for permission to reproduce material should be directed to ECDL Foundation.

Disclaimer

Although every care has been taken by ECDL Foundation in the preparation of this publication, no warranty is given by ECDL Foundation, as publisher, as to the completeness of the information contained within it and neither shall ECDL Foundation be responsible or liable for any errors, omissions, inaccuracies, loss or damage whatsoever arising by virtue of such information or any instructions or advice contained within this publication. Changes may be made by ECDL Foundation at its own discretion and at any time without notice.

The official version of *EUCIP IT Administrator – Module 1 - PC Hardware* is the version published on the EUCIP website: www.eucip.org

EUCIP IT Administrator – PC Hardware

This document details the syllabus for *EUCIP IT Administrator – PC Hardware*. The syllabus describes, through learning outcomes, the knowledge and skills that a candidate for *EUCIP IT Administrator – PC Hardware* should possess. The syllabus also provides the basis for the theory-based test in this module.

Module Goals

EUCIP IT Administrator – PC Hardware requires the candidate to have a broad appreciation of PC hardware concepts and be able to carry out some installation and maintenance of hardware.

The candidate shall be able to:

- Understand the internal elements of a PC, including motherboards, BIOS, microprocessors, memory and buses.
- Understand and manage system resources and recognise and know about PC interfaces including USB, memory cards and SATA.
- Install and partition mass storage devices and recognise video display technologies for monitors and graphic adapters.
- Recognise common printer types and be able to install and manage printers.
- Know about relevant power supplies and the principles of technologies like UPS and EPS.
- Install and replace hardware and diagnose hardware problems.

CATEGORY	SKILL SET	REF.	TASK ITEM
1.1 Motherboards	*1.1.1 Functions and Types*	1.1.1.1	Understand the role of a motherboard.
		1.1.1.2	Understand the basic integrated functions of a motherboard.
		1.1.1.3	Understand the role of the basic components of a motherboard like: CPU slot/socket, chipset, cache memory, buses, ports, expansion slots etc.
		1.1.1.4	Identify the basic components of a motherboard.
		1.1.1.5	Identify different types of motherboards and distinguish between them.
1.2 BIOS	*1.2.1 Basic Features*	1.2.1.1	Understand the term BIOS, where it is stored, and its functions.
		1.2.1.2	Define and understand the function of the BIOS-related terms: POST, SETUP, CMOS, and Firmware.

CATEGORY	SKILL SET	REF.	TASK ITEM
		1.2.1.3	Identify the basic settings that can be adjusted from the BIOS like: time, password, devices, power management, boot order.
	1.2.2 Upgrading	1.2.2.1	Describe how to check the current BIOS version.
		1.2.2.2	Describe how to upgrade the BIOS when required.
		1.2.2.3	Check, modify BIOS settings.
1.3 Microprocessors	*1.3.1 Features and Types*	1.3.1.1	Understand the role of the Central Processing Unit (CPU).
		1.3.1.2	Define the terms CPU speed, overclocking, multiple factor.
		1.3.1.3	Describe the basic components of the CPU like: core, registers, FPU, L1 cache, buses.
		1.3.1.4	Identify factors that determine processor capacity.
		1.3.1.5	List different CPU voltages and understand how they can be regulated.
		1.3.1.6	Distinguish between different CPU types with regard to their capacities and limitations.
	1.3.2 Slots and Sockets	1.3.2.1	Identify the main types of CPU sockets and packages.
		1.3.2.2	Identify best practice in CPU installations like: correct insertion, correct cooler attachment.
		1.3.2.3	Understand the cause of thermal CPU problems and how to solve them.
1.4 Memory	*1.4.1 RAM*	1.4.1.1	Distinguish between static and dynamic memory.
		1.4.1.2	Distinguish between different types of DRAM in terms of speed, capacity.
		1.4.1.3	Understand the terms parity and ECC memory, and their function.
		1.4.1.4	Understand the term banking and the number of bits each type of DRAM uses.

CATEGORY	SKILL SET	REF.	TASK ITEM
	1.4.2 ROM	1.4.2.1	Understand the function of ROM and its features. Compare different types of ROM like: PROM, EPROM, EEPROM.
	1.4.3 Cache	1.4.3.1	Understand how cache memory works and its benefits.
		1.4.3.2	Identify different types of cache memory and their location.
		1.4.3.3	Understand the operation and benefit of disk cache.
1.5 Buses	*1.5.1 Structure and Bandwidth*	1.5.1.1	Understand the term bus and its function.
		1.5.1.2	Describe the structure of a bus.
		1.5.1.3	Understand the function of address bus, data bus, and control bus.
		1.5.1.4	Understand how bandwidth can affect a bus.
	1.5.2 Bus Types	1.5.2.1	Define the terms Front Side Bus and Back Side Bus.
		1.5.2.2	Understand the function of I/O buses.
		1.5.2.3	Distinguish between various I/O buses like: PCI, PCI-X, USB.
1.6 System Resources	*1.6.1 Understand and Manage System Resources*	1.6.1.1	Understand the function of I/O port addresses.
		1.6.1.2	Understand the function of an interrupt request (IRQ).
		1.6.1.3	Understand the function of DMA.
		1.6.1.4	Outline power management goals, techniques and standards.
		1.6.1.5	Check used and available system resources.
1.7 Interfaces	*1.7.1 Parallel ATA Interface*	1.7.1.1	Understand how an IDE interface works, its limitations and capacities.
		1.7.1.2	Understand the terms: Primary IDE, Secondary IDE, Master and Slave.

CATEGORY	SKILL SET	REF.	TASK ITEM
		1.7.1.3	Identify how many IDE drives a PC can handle. Configure IDE drives using the BIOS settings.
	1.7.2 SCSI Interface	1.7.2.1	Understand how the SCSI interface works and how it differs from PATA.
		1.7.2.2	Understand the terms Host adapter, SCSI ID, LUN and Terminator.
		1.7.2.3	Describe the main types of SCSI, their capacities and limitations.
		1.7.2.4	Identify how many SCSI devices a SCSI chain can handle. Configure SCSI devices.
		1.7.2.5	Identify different SCSI cables and connectors.
	1.7.3 Serial ATA Interface	1.7.3.1	Understand the purpose and function of a SATA interface.
	1.7.4 USB Interface	1.7.4.1	Distinguish between USB interfaces, their working principles, capacities and limitations.
		1.7.4.2	Identify physical USB connections and understand their limits.
		1.7.4.3	Identify how many USB devices can be connected to a PC.
	1.7.5 FireWire Interface	1.7.5.1	Understand the different FireWire interfaces and their working principles, capacities and limitations.
		1.7.5.2	Outline how many FireWire devices can be used. Understand Firewire's limitations.
	1.7.6 Memory Card	1.7.6.1	Identify different types of memory card like: Flash, SD, Memory Stick.
		1.7.6.2	Describe the purpose of a card reader.
	1.7.7 RAID Controller	1.7.7.1	Identify RAID configuration types for performance and security.
		1.7.7.2	Understand the hot swap capabilities of RAID drives.
		1.7.7.3	Identify the function of the SATA RAID controller card.

CATEGORY	SKILL SET	REF.	TASK ITEM
		1.7.7.4	Identify the function of the SCSI RAID controller card.
1.8 Mass Storage	*1.8.1 Principles*	1.8.1.1	Understand the operation of a disk and how it stores data. Understand the terms track, sector, cylinder, cluster, CHS.
		1.8.1.2	Partition a hard disk. Understand the terms logical drives and active partition.
		1.8.1.3	Install a hard disk or optical drive. Identify which cables are required and how they are connected.
		1.8.1.4	Understand the disk management terms: low level format, partition, high level format.
		1.8.1.5	Distinguish between various disk technologies like: CD-R, CD-RW, DVD+/-R, DVD+/-RW, Blu-ray.
1.9 Video Display	*1.9.1 Monitor*	1.9.1.1	Distinguish between common monitor types like: TFT, LED.
		1.9.1.2	Identify factors that impact on image quality like: resolution, refresh rate, number of colours.
	1.9.2 Graphics Adapter	1.9.2.1	Identify the features of the most common display modes like: VGA, SVGA, and XGA.
		1.9.2.2	Understand the function of key components of a graphics adapter like: GPU, memory, Video BIOS, RAMDAC.
		1.9.2.3	Identify the function of AGP, different types of AGP, and the advantages of AGP.
		1.9.2.4	Identify GPU thermal problems and cooling techniques like: fan, and heat pipes.
		1.9.2.5	Identify different graphic adapters-to-monitor connectors and cables.
		1.9.2.6	Identify different multiple graphics adapters configurations like: SLI, Crossfire.

CATEGORY	SKILL SET	REF.	TASK ITEM
	1.9.3 Graphics Library	1.9.3.1	Understand the function of specifications for defining graphics like: DirectX, OpenGL.
1.10 Printers	*1.10.1 Types*	1.10.1.1	Distinguish between the main printing technologies like: dot-matrix, inkjet and laser.
		1.10.1.2	Understand how a dot matrix printer works, its benefits and limitations.
		1.10.1.3	Understand how an inkjet printer works, its benefits and limitations.
		1.10.1.4	Understand how a laser printer works, its benefits and limitations.
		1.10.1.5	Understand how thermal transfer and sublimation printers works, their benefit and limitations.
	1.10.2 Installing and Managing	1.10.2.1	Recognise the different ways that a PC can communicate with a printer like: parallel, serial, USB, wireless and LAN.
1.11 Power Supply	*1.11.1 Types and Function*	1.11.1.1	Understand the terms volt, ampere, ohm, watt, alternating current, and direct current.
		1.11.1.2	Understand the function of a power supply and recognise different types of supply.
		1.11.1.3	Identify different power connections to peripherals.
		1.11.1.4	Understand the terms APM and ACPI.
	1.11.2 ESD	1.11.2.1	Understand the term surge protector and how it works. Understand the term electrostatic discharge (ESD), when it occurs, and the damage it causes.
		1.11.2.2	Identify steps to protect hardware from ESD damage. Understand how weather conditions affect ESD.
	1.11.3 UPS	1.11.3.1	Understand the purpose of USP and how the different types of UPS work and communicate with a PC.
		1.11.3.2	Understand the potential impact of power-on current peak on chopper power supply.

CATEGORY	SKILL SET	REF.	TASK ITEM
1.12 Hardware Installation	*1.12.1 Install and Replace Hardware*	1.12.1.1	Install and replace a basic component like: CPU, memory, power supply, motherboard, hard disk, graphics adapter.
		1.12.1.2	Install and configure a second hard disk or CD-ROM. Create and manage several partitions.
		1.12.1.3	Install expansion cards like: sound card, network interface card.
		1.12.1.4	Install and configure normal controller adapter or RAID controller version.
1.13 Diagnosis and Troubleshooting	*1.13.1 Hardware Problems*	1.13.1.1	Recognise the most relevant error messages during start up like: "invalid system disk" message, "keyboard error" message. Identify steps to resolve common errors.
		1.13.1.2	Recognise an error message from a basic component like: startup beep tones.
		1.13.1.3	Check the BIOS for the installed hardware and its configuration.
		1.13.1.4	Check used resources like: I/O addresses, IRQs and DMAs.