

Title	Demonstrate and apply intermediate knowledge of personal computer engineering		
Level	5	Credits	15

Purpose	<p>This unit standard covers the concepts of the functions of personal computer hardware and software components, as well as construction and maintenance methods, and safety practices to be observed.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – demonstrate knowledge of computer hardware and design concepts; – demonstrate and apply knowledge of computer hardware; – assemble a personal computer in accordance with given specifications; – install, configure, and troubleshoot computer operating systems; – connect a PC to the internet and another PC; – install, commission, and troubleshoot printers; and – demonstrate knowledge of and apply preventive maintenance and troubleshooting techniques to a personal computer to ensure optimal performance.
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Classification	Electronic Engineering > Computer Engineering
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Available grade	Achieved
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Guidance Information

- 1 This unit standard is intended for use in engineering courses at diploma level with assessment primarily against laboratory assignments.
- 2 This unit standard is one of two designed to cover knowledge and application of personal computer engineering, the other being unit standard 16976, *Demonstrate and apply advanced knowledge of personal computer engineering*. It is recommended that competency in this unit standard be achieved before assessment against unit standard 16976 is attempted.
- 3 **References**
 CompTIA A+ Examination Objectives;
 Health and Safety at Work Act 2015;
 IT Essentials I: PC Hardware and Software Companion Guide (Cisco Networking Academy Program), Cisco Networks, Cisco Press, ISBN: 1587131366;
 and all subsequent amendments and replacements.

- 4 Definitions
CPU – central processing unit.
DHCP – dynamic host configuration protocol.
DSL – digital subscriber line.
Industry practice – practice used and recommended by organisations involved in the electrotechnology industry.
Intermediate knowledge – means employing a broad knowledge base, with substantial depth in some areas of the subject matter, to analyse and interpret a wide range of information.
Organisational requirements – includes documented procedures and/or specifications relating to processes, practices and activities within the training organisation as well as oral instructions from authorised organisation representatives.
PC – personal computer.
- 5 All measurements are to be expressed in Système International (SI) units, and, where required, converted from Imperial units into SI units.
- 6 All activities must comply with: any policies, procedures, and requirements of the organisations involved; the standards of relevant professional bodies; and any relevant legislative and/or regulatory requirements.
- 7 Range
- performance in relation to the outcomes of this unit standard must comply with the Health and Safety at Work Act 2015;
 - laboratory and workshop safety practices are observed at all times.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of computer hardware and design concepts.

Performance criteria

- 1.1 Computer design concepts and hardware are described in terms of operational processes and applications in accordance with industry practice.

Range includes but is not limited to – circuit board design; component operation and location; processor module types; power supply requirements; storage devices, processor operation and parameters; bus design; data communication.

Outcome 2

Demonstrate and apply knowledge of computer hardware.

Performance criteria

- 2.1 Common computer hardware components, their purpose, and operating characteristics are described.
- Range hardware components may include but are not limited to – disk drives, circuit boards, processor modules, power supplies, memory.
- 2.2 Computer hardware conflicts are resolved in accordance with industry practice.
- Range resource management, interface timing, hardware drivers.

Outcome 3

Assemble a personal computer in accordance with given specifications.

Range specifications include but are not limited to – purpose, capabilities, application.

Performance criteria

- 3.1 Components of a personal computer are selected and assembled in accordance with specifications and industry practice.
- Range may include but is not limited to – case, power supply, motherboard, CPU, memory modules, disk drives, interface cards.
- 3.2 External devices are connected to the computer in accordance with given specifications, organisational requirements, and industry practice.
- 3.3 Tests confirm that the personal computer performs to specification in accordance with industry practice.
- Range operational performance, safety.

Outcome 4

Install, configure, and troubleshoot computer operating systems.

Range evidence of two operating systems is required.

Performance criteria

- 4.1 Computer operating systems are installed and configured in accordance with industry practice.
- 4.2 Troubleshooting techniques for computer operating systems are performed in accordance with industry practice.
- Range troubleshooting techniques include but are not limited to – logical interpretation of test results; use of product leaflets and instructions, testing instructions, troubleshooting guides.

Outcome 5

Connect a PC to the internet and another PC.

Range may include but is not limited to – peer-to-peer network, switch, modem.

Performance criteria

- 5.1 Methods of interconnecting PCs to each other and the internet are described in accordance with industry practice.
- Range may include but is not limited to – cross-over cable, switch, dial-up modem, cable modem, DSL modem.
- 5.2 Two PCs are connected and configured in a peer-to-peer network in accordance with industry practice.
- Range may include but is not limited to – cross-over cable, switch, static IP addresses.
- 5.3 A PC is connected to the internet and configured in accordance with industry practice.
- Range may include but is not limited to connections to – existing LAN, dial-up or DSL modem, static IP address, setting for address by dhcp.

Outcome 6

Install, commission, and troubleshoot printers.

Range may include but is not limited to – inkjet and laser printers.

Performance criteria

- 6.1 Printers are installed, connected to a network, and commissioned in accordance with given specifications, manufacturers' instructions and industry practice.
- 6.2 Troubleshooting techniques to identify the location of printer problems are logical, and problems are corrected in accordance with industry practice.

Outcome 7

Demonstrate knowledge of and apply preventive maintenance and troubleshooting techniques to a personal computer to ensure optimal performance.

Performance criteria

- 7.1 Safety, environmental protection, and preventative maintenance procedures relating to servicing a personal computer are described and applied in accordance with industry practice to ensure optimal performance.

7.2 Troubleshooting techniques to identify hardware and software faults in personal computers are demonstrated in accordance with industry practice.

Range troubleshooting techniques include but are not limited to – logical interpretation of test results; use of product leaflets and instructions, testing instructions, troubleshooting guides.

This unit standard is expiring. Assessment against this standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 February 1998	31 December 2022
Revision	2	12 December 2000	31 December 2022
Review	3	18 December 2006	31 December 2022
Rollover and Revision	4	28 June 2018	31 December 2022
Review	5	28 January 2021	31 December 2022

Consent and Moderation Requirements (CMR) reference

0003

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.