Computer Hardware: Hardware Installation and Maintenance: Advanced

HIGHER NATIONAL DIPLOMA

计算机硬件：硬件组装与维护（高级）

【英】苏格兰学历管理委员会（SQA）

英文原版

Unit Student Guide

COMPUTING: Software Development

DH2Y 34

中国时代经济出版社

SCOTTISH QUALIFICATIONS AUTHORITY

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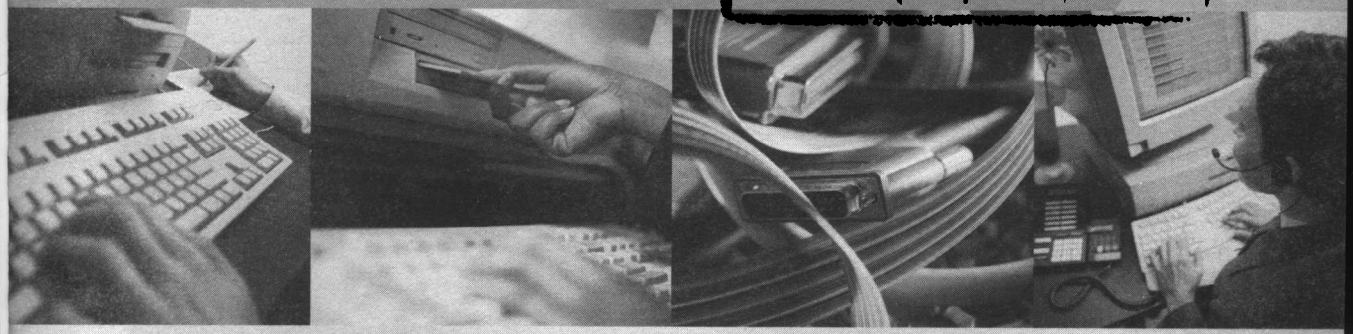

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Computer Hardware: Hardware Installation and Maintenance: Advanced

苏格兰学历管理委员会著

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1 Introduction to the unit

1.1 What this unit is about

The aim of this unit is to enable you to work effectively in a computer hardware technical support role. It attempts to provide the underpinning knowledge required to understand the operation of a personal computer system's hardware at subsystem level. In addition to the underpinning knowledge you will gain experience of installing, configuring, maintaining and fault-finding a range of computer system hardware.

This unit is primarily intended for students who expect to work in an IT support role but would also be interesting and relevant to all students on an IT programme of study requiring a deeper, or more practical, understanding of computer hardware.

This unit provides details of the current components and standards, which will inevitably change. Every attempt has been made to be as general as possible and to provide guidelines which will be applicable to forthcoming components. The skills and knowledge gained in this unit should be relevant in the future and give a good opportunity to keep abreast of the rapid changes in computer system hardware.

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Where possible, your tutor will point out advances in technology at the relevant parts of study and produce 'inserts' which can be added to your notes to keep the package up to date. The unit contains internet links so that you can keep up to date with the latest advances in hardware technology, in addition to this you may also be given internet links from your Lecturer that you can use to keep up to date with the latest advances.

Please note: The first three study sections are contained in the companion volume for this unit entitled: *DH2Y 34 Computer Hardware: Hardware Installation and Maintenance: Introduction.* Study sections four to seven are contained in this book.

1.2 Outcomes

There are four learning outcomes for this unit.

Outcome 1 covers the majority of the underpinning knowledge and looks at the major subsystems of a modern personal computer.

Outcome 2 is mostly practical and involves the installation and configuration of a range of computer system hardware components and peripherals.

Outcome 3 is another mostly practical outcome which involves you performing routine maintenance, basic fault-finding and rectification at subsystem level.

Outcome 4 looks at safe working practices that should

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be employed while working on a computer system, and also the identification of risks while working on a computer system.

Outcome 1

On completion of this unit you will be able to describe the major subsystems and operation of a modern personal computer.

Knowledge and/or skills

- Types and characteristics of motherboards, cases and power supplies.
- Types and functions of motherboard components and interface connectors.
- Operation and interfacing of input/output devices.
- Operation and interfacing of peripheral equipment.
- Operation and interfacing of storage devices.
- Installation requirements for expansion interface cards.

Outcome 2

On completion of this unit you will be able to install and

configure system hardware components and peripherals.

Knowledge and/or skills

- Connect and commission a standard computer system.
- Connect and configure peripheral equipment.
- Install and configure a motherboard, CPU and RAM.
- Install and configure expansion interface cards.
- Install and configure storage devices.

Outcome 3

On completion of this unit you will be able to perform routine maintenance, basic fault-finding and rectification at a subsystem level.

Knowledge and/or skills

- Identify and rectify video faults.
- Identify and rectify storage device faults.
- Identify and rectify input/output device or

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interface faults.

- Identify and rectify peripheral device or interface faults.

Outcome 4

On completion of this unit you will be able to identify risks and use safe working practices.

Knowledge and/or skills

- Fire hazards and precautions.
- Electrical hazards and the effects of electric shocks.
- Function of fuses and residual current devices.
- PAT regulations.
- Effects of ESD.
- Antistatic precautions and safety hazards.
- LSZH sheathing cable protection.

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1.3 Unit structure

This unit contains the following study sections. You will need two books to cover the whole unit.

Study sections one, two and three are contained in the companion volume for this unit entitled: *DH2Y 34 Computer Hardware: Hardware Installation and Maintenance: Introduction.* Study sections four to seven are contained in this book.

Section	**Approximate study time**
1. Legal considerations and safe working practices	10 hours
2. Components of a personal computer system	12 hours
3. Personal computer system assembly	10 hours
4. Input/output devices and interfaces	12 hours
5. Peripheral devices	12 hours
6. Storage devices	12 hours
7. Fault-finding	12 hours

1.4 How to use these learning materials

This package has been designed to meet the specific outcomes of the Computer Hardware: Hardware Installation and Maintenance Higher National unit.

The package has been split into seven sections to break up the subject area into manageable topics. Since many hardware components are closely related, this is a difficult task and some components are discussed in more than one section. In this case the component may be briefly introduced in one section

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and discussed in detail in another section. This is detailed in the notes. An example would be expansion slots, which are briefly covered when looking at motherboards (Section 2) but are covered in more detail when looking at I/O interfaces (Section 4).

The sections are designed to be completed in numerical order although, depending on circumstances, your tutor may recommend a different progression.

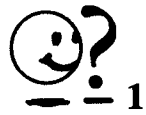
There is no direct correlation between outcomes and sections. The knowledge for a particular outcome is split over different sections.

The study times quoted above should be used as a guide only.

1.5 Symbols used in this unit

These learning materials allow you to work on your own with tutor support. As you work through the course, you will encounter a series of symbols which indicate that something follows that you are expected to do. You will notice that as you work through the sections you will be asked to undertake a series of self-assessed questions, activities and tutor assignments. An explanation of the symbols used to identify these is given below.

Self-Assessed question



This symbol is used to indicate a self-assessed question (SAQ). Most commonly, SAQs are used to check your understanding of the material already covered in a section.

This type of assessment is self contained — everything is provided within the section to enable you to check your understanding of the materials.

The process is simple:

- you are set SAQs throughout the section;
- you respond to these by writing either in the space provided in the assessment itself or in your notebook;
- on completion of the SAQ you turn to the end of the section to compare the model SAQ answers to yours;
- if you are not satisfied after checking your answers, turn to the appropriate part of the section and go over the topic again.

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Remember, the answers to SAQs are contained within the study materials. You are not expected to guess at these answers.

Activity

This symbol indicates an activity, which is normally a task you will be asked to do that should improve or consolidate your understanding of the subject in general or a particular feature of it. Suggested guidelines to answers will be given at the end of the relevant section.

Remember that the SAQs and activities contained in your package are intended to allow you to check your understanding and monitor your own progress throughout the course. It goes without saying that the answers to these should be checked only after the SAQ or activity has been completed. If you refer to these answers before completing the activities, you cannot expect to get maximum benefit from your course.

Tutor assignment — formative assessment

T 1

This symbol means that a tutor assignment follows. These are found at the end of each section. The aim of these assignments is to cover and/or incorporate the main topics of the section and prepare you for unit (summative) outcome assessment.

1.6 Other resources required

It would be beneficial if you have access to hardware for examination and installation throughout the course. This is not a requirement but would help you to assimilate the content of the sections and gain experience in the practical activities. This could be achieved by having access to a small selection of old hardware, or by ensuring access to laboratory facilities at your centre or another suitable location.

It would also be an advantage if you had Internet access to perform some of the activities and for general research and background information.

To cover the whole unit you will need a copy of the companion volume for this unit entitled: *DH2Y 34 Computer Hardware: Hardware Installation and Maintenance: Introduction.*

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1.7 Assessment information

How you will be assessed

Throughout the course you will be asked to undertake activities, SAQs and a tutor assignment for each section. These are primarily intended to give you feedback on your progress and to judge your level of understanding. This provides you with an opportunity to alter your pace and/or to discuss your progress with your tutor, who could provide assistance and guidance. The tutor assignments are returned to the tutor for marking and feedback and these will give the tutor an opportunity to assess your progress.

The formal assessment can be carried out in several ways at the discretion of the centre and the tutor. The timing of the formal assessment will depend largely on the level of access available to allow you to perform the required practical tasks. For example, if it is easy to arrange practical sessions, or if you have the facilities in your workplace, then the practical assessment could take place at appropriate stages throughout the course. If, however, access to hardware is limited then the assessment could be carried out at the end of the course in a single session. If possible it would be more beneficial for you to carry out practical assessment at appropriate points during the course of study.

One of the formal assessments is a 'closed book assessment' and the tutor will have to arrange appropriate facilities for this to take place. The other assessments are practical and will require that you

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