



National Unit specification: general information

Unit title: Mobile Technology: Architecture (SCQF level 6)

Unit code: H2P9 12

Superclass: CB

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Summary

This Unit develops candidates' knowledge of different mobile technology systems. It allows candidates to gain a basic understanding of how different mobile systems work and how data is processed in the systems. On completion, candidates will have an understanding of the underlying technology and operation of different mobile devices. They will also have the opportunity to investigate potential future developments in mobile technologies.

This is a mandatory Unit in the National Progression Award (NPA) in Mobile Technology (SCQF level 6) and National Certificate (NC) in Mobile Technology (SCQF level 5), but is also available as a freestanding Unit.

This Unit is suitable for candidates with basic skills and/or knowledge of mobile systems and who wish to extend them further.

Outcomes

- 1 Demonstrate an understanding of how data is represented in mobile devices.
- 2 Identify and describe system components for different mobile devices.
- 3 Compare and contrast system specifications for different types of mobile devices.
- 4 Investigate and describe the current and future trends in mobile device development.

Recommended entry

While entry is at the discretion of the centre, it would be beneficial if candidates have achieved one of the following, or equivalent:

H1T1 11 *Mobile Technology Systems*
FW02 11 *Computer Systems Architecture*

General information (cont)

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Credit points and level

1 National Unit credit at SCQF level 6: (6 SCQF credit points at SCQF level 6*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Core Skills

Achievement of this Unit gives automatic certification of the following Core Skills component:

- ◆ Using Number at SCQF level 5

There are also opportunities to develop aspects of Core Skills which are highlighted in the support notes of this Unit specification.

National Unit specification: statement of standards

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Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Outcome 1

Demonstrate an understanding of how data is represented in mobile devices.

Performance Criteria

- (a) Convert between different number bases.
- (b) Describe how ASCII and Unicode characters are represented in mobile system storage.
- (c) Define memory storage terminology for mobile systems.

Outcome 2

Identify and describe system components for different mobile devices.

Performance Criteria

- (a) Identify different types of memory used in mobile systems.
- (b) Describe the different types of memory used in mobile systems.
- (c) Identify key components of mobile systems.
- (d) Describe the structure and component functions of the underlying technology in different types of mobile devices in the form of box diagrams and bus connections.
- (e) Describe clock speed in relation to the CPU.

Outcome 3

Compare and contrast system specification for different types of mobile devices.

Performance Criteria

- (a) Produce relevant mobile system specifications from a given brief.
- (b) Produce a brief report justifying each specification.

Outcome 4

Investigate and describe the current and future trends in mobile device development.

Performance Criteria

- (a) Investigate current and future trends in mobile technology systems.
- (b) Use technical terms accurately.
- (c) Produce a report of research findings.

National Unit specification: statement of standards (cont)

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Evidence Requirements for this Unit

Evidence is required to demonstrate that candidates have achieved all Outcomes and Performance Criteria.

For Outcome 1 — written and/or oral recorded evidence is required which includes:

- ◆ conversion of two positive denary numbers to binary up to and including 8-bits and an explanation of the conversion process
- ◆ conversion of two 8-bit binary numbers to denary and an explanation of the conversion process
- ◆ conversion of two positive denary numbers to hexadecimal and an explanation of the conversion process
- ◆ conversion of two hexadecimal numbers to denary and an explanation of the conversion process
- ◆ a description of ASCII and Unicode standards
- ◆ addition and subtraction of 8-bit binary numbers
- ◆ addition and subtraction of hexadecimal numbers of four place values
- ◆ a description of bits, bytes, kilobyte, megabyte, gigabyte and terabyte

For Outcome 2 — written and/or oral recorded evidence is required which includes:

- ◆ a description of RAM, ROM, cache, virtual memory, types of flash memory, backing storage
- ◆ describe simplified box diagrams of two mobile devices showing the main components, the function of each component and how they are connected, eg mobile phone, MP3 player, PDA, tablet or simplified laptop/netbook computer. The diagrams for each device will differ and can include blocks for the processor, types of memory storage, input devices, output devices, interfaces such as Bluetooth and USB, MODEM and power management, etc which are appropriate to the device.
- ◆ a description of clock speed (MHz and GHz) in relation to the CPU core(s)
- ◆ produce a histogram of benchmark performance marks for five processors from benchmarking tables

Evidence for Outcomes 1 and 2 will be obtained under closed-book, supervised conditions. Candidates will not have access to electronic aids.

For Outcome 3 — evidence will be obtained by individual candidates' production of mobile device specifications, detailing all components and the operating systems required to fulfil two client briefs. These will be accompanied by a report or presentation which justifies the specifications and must reference all of the following:

- ◆ processors
- ◆ internal and external storage capability
- ◆ device interfaces
- ◆ battery capacity and power management
- ◆ form factor
- ◆ cost

National Unit specification: statement of standards (cont)

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The performance evidence for Outcome 3 will be produced under open-book conditions and consist of a 500 word written report or a presentation of approximately 10 minutes duration.

An assessor observation checklist will be used to record that all the Performance Criteria have been met. References to information sources must be included in the written report or presentation.

For Outcome 4 — a 500 word written report or oral recorded evidence is required, to be produced under open-book conditions, which includes:

- ◆ description of current and potential future trends in mobile technology hardware which takes account of processors, storage, connectivity, battery, power management, user interface (touch screen, voice, etc), and cost
- ◆ description of converging mobile technologies
- ◆ accurate technical terminology including a glossary of terms used
- ◆ references to information sources

National Unit specification: support notes

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This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

The overall aim of this Unit is to extend candidates' understanding of the workings of different mobile technology devices such as mobile phones, netbooks, MP3 players, tablets, e-books, etc. Candidates should ideally study this Unit with others which make up the NPA in Mobile Technology (level 6). This would place the Unit in context with mobile applications, connectivity and operating systems.

The Unit focuses on memory and its terminology, and the interconnection of the various parts of mobile devices (such as processor, memory and interfaces for input and output.)

Emphasis should be placed on the current specification of mobile devices and the internet should be used extensively for researching these. Candidates should be encouraged to read appropriate articles on contemporary mobile technology issues and possible future developments.

Guidance on learning and teaching approaches for this Unit

Through delivery of this Unit, candidates should develop an appropriate technical vocabulary and show confidence in reading and understanding of mobile device specifications. Exposure should be given to as many different specifications of mobile devices as possible.

Outcome 1 — concentrates on how data is represented and how it is converted into different forms. It can be assumed that any of these representational issues will form part of the day-to-day activities of those working with mobile technology systems.

As far as possible, the topics should be delivered in such a way that the practical uses and implications of the subject are made clear to candidates.

The representation of ASCII characters as binary patterns can be used to highlight the idea that data held in a mobile system is held in a binary representation.

Memory terminology should be delivered in the context of different flash drives, RAM, cache, virtual memory, etc.

Outcome 2 — is largely based in hardware and it is suggested that candidates are shown some hardware from different mobile systems as part of their learning. The idea of mobile systems being different from each other but having some similarities should be included in this Outcome. The intention is that candidates become familiar with the components and interfaces and how they relate to each other.

National Unit specification: support notes (cont)

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Outcomes 3 and 4 — are based on candidates doing some research on the internet or using magazines or other appropriate sources. Accurate terminology should be used.

The role of cache, RAM, clock speed and number of cores should be highlighted in relation to system performance.

Emphasis should be placed on current mobile devices, form factor and specifications and possible future developments in mobile devices.

Guidance on approaches to assessment for this Unit

The assessment for Outcomes 1 and 2 could take the form of a set of restricted response questions covering the Evidence Requirements. These Outcomes will be assessed under closed-book conditions in which candidates are supervised and do not have access to electronic aids.

For Outcome 3, candidates are given a brief in which two clients are requesting mobile devices for different purposes (eg business use and personal use with the emphasis on music, pictures, social networking, etc). Candidates must produce a detailed specification for both with an accompanying report justifying each specification with reference to the brief and using the correct terminology. The report must address all points in the Evidence Requirements.

For Outcome 4, all Evidence Requirements must be met within the report and the word count should be within 10% above or below the 750 word target.

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

Opportunities for developing Core Skills

In this Unit, candidates will develop number skills when converting numbers between different number bases. Candidates will also develop skills in providing and justifying a mobile device specification to a given brief using up-to-date components. They will also have the opportunity to produce a report or presentation on current and future trends of mobile technologies.

Achievement of this Unit gives automatic certification of the Core Skills component *Using Number* at SCQF level 5. Additionally, candidates may develop aspects of the Core Skills of *Information and Communication Technology*, *Problem Solving*, and *Communication*.

National Unit specification: support notes (cont)

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Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements

History of changes to Unit

Version	Description of change	Date

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