



Software Design and Development (National 5)

SCQF: level 5 (9 SCQF credit points)

Unit code: H223 75

Unit outline

The general aim of this Unit is for the learner to develop knowledge, understanding and practical problem-solving skills in software design and development through appropriate software development environments. Learners will develop their programming and computational thinking skills by developing, implementing and testing practical solutions and explaining how these programs work. They will also develop an understanding of how data and instructions are stored in binary form, the basic architecture of a computer, and an awareness of different contemporary software development languages/environments.

Learners who complete this Unit will be able to:

- 1 Explain how programs work, drawing on understanding of concepts in software development and basic computer architecture
- 2 Develop short programs using one or more software development environments
- 3 Produce a short detailed report comparing two contemporary software development languages or environments

This Unit is a mandatory Unit of the National 5 Computing Science Course and is also available as a free-standing Unit. The Unit Specification should be read in conjunction with the *Unit Support Notes*, which provide advice and guidance on delivery, assessment approaches and development of skills for learning, skills for life and skills for work. Exemplification of the standards in this Unit is given in the *Unit Assessment Support*.

The *Course Assessment Specification* for the National 5 Computing Science Course gives further mandatory information on Course coverage for learners taking this Unit as part of the National 5 Computing Science Course.

Recommended entry

Entry to this Unit is at the discretion of the centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

- ◆ National 4 Computing Science Course or relevant component Units
- ◆ Numeracy (National 4) Unit

Core Skills

Achievement of this Unit gives automatic certification of the following:

Core Skill component(s) for the Unit	Providing and Creating Information at SCQF level 5
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Equality and inclusion

This Unit Specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence. For further information, please refer to the *Unit Support Notes*.

Standards

Outcomes and assessment standards

Outcome 1

The learner will:

- 1 Explain how programs work, drawing on understanding of concepts in software development and basic computer architecture by:**
 - 1.1 Reading and explaining code
 - 1.2 Describing the purpose of a range of programming constructs and how they work
 - 1.3 Describing the purpose and role of variables
 - 1.4 Describing in simple terms how programs relate to low-level operations and structures

The range of programming constructs should include expressions, sequence, selection, iteration and pre-defined functions.

Outcome 2

The learner will:

- 2 Develop short programs using one or more software development environments by:**
 - 2.1 Selecting and using a combination of expressions, sequence, selection, iteration and pre-defined functions
 - 2.2 Selecting and using appropriate simple data types, such as numeric (integer and real), string and Boolean
 - 2.3 Testing digital solutions using own test data
 - 2.4 Identifying and rectifying errors in programs
 - 2.5 Providing internal commentary or documentation

Programs should include at least two constructs and at least two data types.

Outcome 3

The learner will:

- 3 Produce a short detailed report comparing two contemporary software development languages or environments by:**
 - 3.1 Describing how each represents standard constructs
 - 3.2 Comparing the range of data types provided
 - 3.3 Comparing their editing features
 - 3.4 Describing how high-level code is translated and executed

Evidence Requirements for the Unit

Assessors should use their professional judgement, subject knowledge and experience, and understanding of their learners, to determine the most appropriate ways to generate evidence and the conditions and contexts in which they are used.

Evidence for Outcomes 1 may be oral or written. Evidence of the assessment standards for Outcome 2 may be derived from many software development tasks; formal documentation is not expected or required. The report for Outcome 3 need not be written, but may be presented visually or in some other format.

Exemplification of assessment is provided in the *Unit Assessment Support*. Advice and guidance on possible approaches to assessment is provided in the *Unit Support Notes*.

Development of skills for learning, skills for life and skills for work

It is expected that learners will develop broad, generic skills through this Unit. The skills that learners will be expected to improve on and develop through the Unit are based on SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work* and drawn from the main skills areas listed below. These must be built into the Unit where there are appropriate opportunities.

2 Numeracy

- 2.1 Number processes
- 2.3 Information handling

4 Employability, enterprise and citizenship

- 4.2 Information and communication technology (ICT)

5 Thinking skills

- 5.3 Applying
- 5.4 Analysing and evaluating

Amplification of these is given in SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work*. The level of these skills should be at the same SCQF level of the Unit and be consistent with the SCQF level descriptor. Further information on building in skills for learning, skills for life and skills for work is given in the *Unit Support Notes*.

Employability, enterprise and citizenship skills shown in this National Unit provide automatic certification of Core Skill component: Providing and Creating Information at SCQF level 5.

Administrative information

Published: June 2013 (version 1.1)

Superclass: CB

History of changes to National Unit Specification

Version	Description of change	Authorised by	Date
1.1	Core skills information added.	Qualifications Development Manager	June 2013

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Note: readers are advised to check SQA's website: www.sqa.org.uk to ensure they are using the most up-to-date version of the Unit Specification.

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