Software Design and Development (National 4)

SCQF: level 4 (9 SCQF credit points)

Unit code: H223 74

Unit outline

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

Learners who complete this Unit will be able to:

1 Explain how simple programs work, drawing on understanding of basic concepts in software development
2 Develop short programs using a software development environment

This Unit is a mandatory Unit of the National 4 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 Unit Assessment Support*.

The *Added Value Unit Specification* for the National 4 Computing Science Course gives further mandatory information on Course coverage for learners taking this Unit as part of the National 4 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 3 Computing Science Course or relevant component Units
♦ National 3 Numeracy

In terms of prior learning and experience, relevant experiences and outcomes may also provide an appropriate basis for doing this Unit.

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 simple programs work, drawing on understanding of basic concepts in software development by:

1.1   Reading and explaining code
1.2   Identifying the purpose of a range of programming constructs and how they work
1.3   Identifying the purpose of a range of variable types

The range of programming constructs should include expressions, sequence, selection and iteration.

Outcome 2

The learner will:

2   Develop short programs using a software development environment by:

2.1   Selecting and using combinations of appropriate constructs
2.2   Selecting and using appropriate simple data types, such as numeric (integer) and string
2.3   Testing digital solutions using supplied test data

Programs should include at least one construct and one data type.

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 Outcome 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.

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

Assessment standard thresholds

If a candidate successfully meets the requirements of the specified number of Assessment Standards they will be judged to have passed the Unit overall and no further re-assessment will be required.

The specific requirements for this Unit is as follows:

♦   4 out of 6 Assessment Standards must be achieved.

It should be noted that there will still be the requirement for candidates to be given the opportunity to meet all Assessment Standards. The above threshold has been put in place to reduce the volume of re-assessment where that is required.

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

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.*

Administrative information

Published: September 2018 (version 2.1)

Superclass: CB

History of changes to National Unit Specification

Version	Description of change	Authorised by	Date
2.0	Revisions made to Assessment Standards in Outcomes 1 and 2. Outcome 3 and Assessment Standard 2.4 'Identifying and rectifying errors in programs' in Outcome 2 have been removed.	Qualifications Manager	June 2015
2.1	Assessment standard threshold added.	Qualifications Manager	September 2018

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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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