



Higher National Unit specification: general information

Unit title: Systems Development: Testing Software

Unit code: H181 34

Superclass: CB

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Unit purpose

This Unit is designed to provide candidates with knowledge and skills required to test programs to establish the presence of system defects. It will introduce the candidate to testing techniques and strategies that are designed to discover program faults. The use of test plans, test cases and methods of documentation will also be covered.

It is not intended that the candidate will require to use any specific programming language or testing techniques. However the testing techniques and strategies used must be considered current and valid.

On completion of the Unit the candidate should be able to:

- 1 Describe recognised test strategies and techniques used in the testing of software.
- 2 Describe the types of testing currently in use within the software development sector.
- 3 Produce a test plan and test a small application.

Recommended prior knowledge and skills

Entry is at the discretion of the centre. However it would be beneficial if the candidate already possessed good written communication, critical thinking and analytical skills, either through workplace experience or training at an appropriate level. Experience in programming would be advantageous but not essential.

Credit points and level

1 Higher National Unit credit at SCQF level 7: (8 SCQF credit points at SCQF level 7*)

**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.*

General information (cont)

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes of this Unit specification.

There is no automatic certification of Core Skills or Core Skill components in this Unit.

Context for delivery

If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Higher National Unit specification: statement of standards

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The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Describe recognised test strategies and techniques used in the testing of software.

Knowledge and/or Skills

- ◆ The history and purpose of testing
- ◆ Understand the role of a tester
- ◆ Key testing strategies and techniques
- ◆ The requirement for Quality Assurance in the System Development Life Cycles
- ◆ The importance of test documentation

Evidence Requirements

Refer to Evidence Requirements in Outcome 2.

Outcome 2

Describe the types of testing currently in use within the software development sector.

Knowledge and/or Skills

- ◆ Unit Testing
- ◆ Interface Testing
- ◆ System Testing
- ◆ Automated Testing
- ◆ Compliance Testing

Higher National Unit specification: statement of standards (cont)

Unit title: Systems Development: Testing Software

Evidence Requirements for Outcomes 1 and 2

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills for Outcomes 1 and 2 by showing that they can:

- ◆ Describe the purpose of testing
- ◆ Describe a selection of test strategies and techniques including:
 - Unit Testing
 - Interface Testing
 - System Testing
 - Automated Testing
 - Compliance Testing
- ◆ Describe the importance of test documentation as part of the software life cycle
- ◆ Describe a selection of testing methods.

This assessment is open-book. A candidate is required to demonstrate their understanding of all the Knowledge and/or Skills in Outcomes 1 and 2 using any appropriate form, a written report, a detailed presentation, an audio or video recording, etc.

Outcome 3

Produce a test plan and test a small application.

Knowledge and/or Skills

- ◆ Produce a detailed test plan, including strategy.
- ◆ Test a given application using the test plan
- ◆ Document the result of the testing

Evidence Requirements

The candidate should be provided with a small application or code to produce the test documentation. There is no requirement for the candidate to modify the code or use their own code within this Unit.

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ Identify a suitable strategy for testing the given application or code
- ◆ Justify the reason for test strategy
- ◆ Produce an appropriate test plan for the given application or code
- ◆ Test the application or code using the test plan and document the results

This assessment is open-book. A candidate is required to demonstrate their understanding of all the Knowledge and/or Skills in Outcome 3 by producing detailed test documentation.

Higher National Unit specification: support notes

Unit title: Systems Development: Testing Software

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 purpose of this Unit is to provide the candidate with the knowledge and skills to design and implement an effective testing strategy, and to understand the importance and requirement for appropriate Testing within the IT sector.

Outcomes 1 and 2

These Outcomes will provide the candidate with the opportunity to gain knowledge of the fundamental concepts and terminology of testing. The candidate will also understand the roles of a tester, and the importance of testing within the software life cycle.

Specific testing methods are not specified within the Outcome and therefore the centre can use any recognised method or strategy. Examples of these are:

- ◆ Black box testing
- ◆ White box testing
- ◆ Unit level testing
- ◆ Integrated testing
- ◆ System level testing
- ◆ Acceptance testing
- ◆ User interface testing
- ◆ Automated testing
- ◆ Alpha Testing
- ◆ Beta Testing

Outcome 3

The candidate should produce a detailed test plan with a clear design strategy.

The strategy must use a minimum of three different test methods; the number of tests will differ depending on the complexity of the application/code. However the strategy must explain why each method has been selected. If the centre is providing the application/code they must ensure that the application/code given for testing will give the candidate significant scope to achieve this.

The candidate must then complete the testing of the application. It would be advantageous if the application/code provided by the centre had a number of errors in order to ensure that the testing was authentic.

The method of evidencing the tests can be agreed by the centre. Possible examples are written report, e-portfolio, video, blogs, etc. This should be part of the strategy and agreed with the assessor.

Higher National Unit specification: support notes (cont)

Unit title: Systems Development: Testing Software

Guidance on the delivery of this Unit

This Unit has a large theoretical component. Outcomes 1 and 2 will require the candidate to complete a significant amount of research before selecting the best strategy.

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

Researching Test Methods	10 hours
Designing Test Strategy	10 hours
Testing	15 hours
Finalising documentation	5 hours

Guidance on the assessment of this Unit

Outcomes 1 and 2

It is recommended that the candidate should submit a written report explaining the purpose and techniques used in testing software. The report should demonstrate that an appropriate amount of research has been completed and be appropriately referenced.

Outcome 3

The candidate should submit completed test documentation, including test strategy, test plan, and test results. The submitted work should evidence that all elements of the application/code have been tested, using a selection of appropriate methods.

Online and Distance Learning

If this Unit is delivered by open or distance learning methods, additional planning and resources may be required for candidate support, assessment and quality assurance. A combination of new and traditional authentication tools may have to be devised for assessment and re-assessment purposes.

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 social software. 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)*.

Higher National Unit specification: support notes (cont)

Unit title: Systems Development: Testing Software

Opportunities for developing Core Skills

There may be opportunities to gather evidence towards Core Skills in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

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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Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Business Development and Customer Support team, telephone 0303 333 0330.

General information for candidates

Unit title: Systems Development: Testing Software

This Unit is designed to provide you with the history and fundamentals of testing with a specific emphasis on software testing. You will explore the various strategies and techniques required to fully test software.

You will know about the different role testers have and the primary goal of a tester. You will also learn about the many strategies and methods that can be used to test code. You will also gain understanding of the importance of testing and testing documentation within the software lifecycle.

To complete this Unit successfully, you will have to achieve a satisfactory level of performance in both the theoretical and practical Outcomes of the Unit. The assessments within this Unit are open-book and you will need to complete a significant amount of research to complete the Unit.

Although the designs of the assessments are at the discretion of the centre, it is expected that this Unit will require you to produce two reports. The first report should detail your research on testing and the second should comprise of test documentation, detailing strategy and tests on an application or code.