National Unit Specification: general information

UNIT Engineering: Using Information Technology (SCQF level 5)

CODE F5D6 11

SUMMARY

This Unit is a mandatory Unit in the National Qualification Group Awards (NQGA) in Engineering, but can also be undertaken as a free-standing Unit.

This Unit is designed to introduce routine features of word processing, spreadsheets and a relevant software package appropriate to an engineering environment. The candidate will gain practical experience in the use of routine features in these types of software, and in using internet search techniques. The Unit will also provide candidates with information regarding the selection of appropriate software for specific tasks.

OUTCOMES

1 Use a word processing package.
2 Use a spreadsheet package.
3 Use an engineering software package.
4 Carry out searches for information using the internet.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, it would be beneficial if candidates had attained the following, or equivalent:

D01D 10 *Information Technology — Intermediate 1*
E946 10 *Introduction to Computer Application Packages*
Computing Studies Standard Grade — General level

Administrative Information

Superclass: CH

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National Unit Specification: general information (cont)

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CREDIT VALUE

1 credit at SCQF level 5 (6 SCQF points at SCQF level 5*).

**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:

Complete Core Skills	Information and Communication Technology at SCQF Level 5
Core Skill component	none

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

Use a word processing package.

Performance Criteria

(a) Set out document(s) to specified organisational standards.
(b) Input document text.
(c) Amend an existing document to given requirements/specifications.
(d) Proof read and spell check document.
(e) Save document as per organisational standards.
(f) Print document(s) to specified requirements.

OUTCOME 2

Use a spreadsheet package.

Performance Criteria

(a) Complete a spreadsheet to a given specification.
(b) Extract information from a given spreadsheet, matching provided criteria.
(c) Print spreadsheet data appropriately, to specified conditions.

OUTCOME 3

Use an engineering software package.

Performance Criteria

(a) Input data to the package.
(b) Process input data to given parameters.
(c) Produce output from the package satisfying specific requirements.

OUTCOME 4

Carry out searches for information using the internet.

Performance Criteria

(a) Access websites using Uniform Resource Locators (URLs).
(b) Locate desired information, using an efficient and effective search strategy.
(c) Locate relevant information, using internet features efficiently.

National Unit Specification: statement of standards (cont)

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EVIDENCE REQUIREMENTS FOR THIS UNIT

This section details the evidence required to demonstrate that candidates have achieved all Outcomes and Performance Criteria. This evidence should be produced under supervised, controlled conditions.

Performance evidence, supplemented by an assessor observation checklist, is required, which demonstrates that the candidate has achieved all mandatory requirements for all Outcomes. This evidence will be gathered under supervised, open-book conditions.

Achievement will be decided by use of an appropriate assessor checklist. Each exercise or task must include the following:

- six routine functions of a word processing application package
- six routine functions of a spreadsheet application package
- four routine functions of an engineering application package
- gain access to and provide information from a minimum of two web sites

Product evidence — written, oral recorded and or electronic, is required which demonstrates that the candidate has achieved all Outcomes to the standard specified in the Outcome and Performance Criteria. This evidence will be gathered under supervised, open-book conditions.

The Assessment Support Pack (ASP) for this Unit will provide sample assessment materials including assessor checklists, practical tasks and an instrument of assessment for the knowledge. Centres wishing to develop their own assessments should refer to the Assessment Support Pack to ensure a comparable standard.

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

This Unit is a mandatory Unit within National Qualification Group Awards in Engineering at SCQF level 5. The Unit may be delivered as a stand-alone Unit or in combination with other units forming a Group Award.

The overall aim of this Unit is to introduce the Candidate to the routine features of four types of application software:

- Word processing
- Spreadsheet
- Engineering software (chosen by the presenting centre)
- Internet search software

On completion of the Unit candidates should also be able to make an informed choice when identifying an appropriate engineering application package to be used for a specific task. They should also explain why and how using the IT system and software was an appropriate way of carrying out the task.

The Unit is designed to be task-based and it is anticipated that most of the time will be spent by candidates on practical work, although some discussion work is required, for example, when discussing which types of text formats are suitable for specific purposes, and which package to use for a specific task.

Ideally, on completion of the Unit, candidates should be given the opportunity to review their own use of IT software and their own use of IT. Candidates should also be given feedback from the assessor regarding their use of IT and should comment on this feedback in their review. Candidates should explain which software tools and techniques were chosen and how effectively they were used for particular tasks.

Outcome 1

This Outcome deals with the practical use of a word processing package. Exercises may be presented for the candidate to work through in order that they might gain the practical skills necessary to demonstrate competency in the routine skills outlined below.

The practical exercises involved with this Outcome should allow the candidate to use a range of tools, techniques and features of a word processing (WP) package, to produce professional documents.

The creation, amending, saving and management of documents in compliance with organisational standards, should be stressed. The centre may develop these standards in house, or use actual (centre/business/commercial) examples.

National Unit Specification: support notes (cont)

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Candidates should be made aware of the different text file formats and the characteristics and uses of these file types:

- rtf
- html
- txt
- doc
- pdf

The use of proofing tools should be stressed. It should also be stated and illustrated that these tools are not foolproof and, although they are an excellent aid, the candidate must be aware that they must proof read their own work for accuracy.

Outcome 2

This Outcome deals with the practical use of a spreadsheet package. Exercises may be presented for the candidate to work through in order that they might gain the practical skills necessary to demonstrate proficiency in the routine skills outlined in the list below.

The spreadsheet assignment should allow the candidate to perform tasks from the following category list:

- Absolute and relative cell references
- Functions — general, logical, financial, statistical
- Graphs and charts — any type. Data must be used from non adjacent cell ranges
- Printing options — print gridlines, plus row and column headings
- Copy and paste cells (within spreadsheets)
- Headers and footers
- Protection and locked cells
- Formatting features:
  - — cells — such as colour, shading, borders
  - — pages — such as headers and/or footers

Outcome 3

This Outcome deals with the practical use of a package designed for engineering applications. Exercises may be presented for the candidate to work through in order that they might gain the practical skills necessary to demonstrate proficiency in the routine skills outlined in the list below.

This Outcome deals with the candidate's ability to produce a solution to a given task after s/he has developed expertise in the engineering software package used in the presenting centre. It is designed to complement the work undertaken in Outcomes 1 and 2, thus developing transferable skills.

Ideally Outcome 3 might demonstrate the candidate's ability to use an appropriate engineering application package for a specified task. The candidate should be able to discuss the merits of software packages and come to an informed decision about the suitability of each package for the specified task.

National Unit Specification: support notes (cont)

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Outcome 4

This Outcome relates to finding information on the internet. The type of information that candidates are expected to locate should be familiar and relate to their personal and vocational interests, in this case an engineering subject or category.

At least one of the searches should be for a genuine reason, such as identifying a suitable engineering package to handle a task from Outcome 3.

The conditions of assessment should be recorded in terms of working environment, degree of difficulty, expected time to complete and standard of work required. This is to allow for repeat assessment, if required, to be carried out under the same conditions.

Candidates must be able to recognise the component parts of a URL and be able to access a range of websites by entering their URLs. It is not acceptable for candidates to require assistance, or require repeated attempts to enter a URL.

Candidates are required to adopt a search strategy and apply this to finding appropriate information. A search strategy typically includes:

- choosing a search engine
- choosing appropriate keywords and queries
- carrying out searches efficiently using meta search engines, directories, wild cards, AND or NOT (Boolean notation),
- natural search methods.

It is not acceptable at this level for candidates simply to issue a number of individual words, roughly connected with the target information. However candidates are not required to carry out complex searches, involving long strings of keywords connected by complex operators.

Candidates will make use of the following internet features:

- Bookmarks or favourites
- Browser controls
- Hyperlinks, history
- Software settings

Bookmarks (or favourites) should be used to record and access Web addresses.

At this level, candidates should be able to organise the bookmarks or favourites into folders and sub-folders, so it would not be acceptable for them to create a long list of unorganised URLs.

Candidates should be able to use the browser navigation controls, and be able to use them effectively and efficiently to move between pages in a website. They should also be able to use a browser's history facilities to re-visit websites from previous searches. Candidates are expected to know the purpose of the history feature, and be able to use it to re-visit websites. They should also know how to delete the history log.

Examples of software settings could include text size, full screen mode, and menu and toolbar settings.

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

This Unit has been designed to provide practical experience in the use of routine functions of word processing, spreadsheet, and engineering application software. It is anticipated that the vast majority of the time spent on this Unit will be on practical exercises.

The Unit is designed to be task-based and it is anticipated that most of the time will be spent on practical work, although some discussion work is required, for example when discussing the legislation that exists to protect the individual's rights with respect to software.

Outcome 3 can require the candidate to make an informed decision as to what software packages to use for specific tasks if the presenting centre can provide more than one appropriate package. It is expected that the features of each application, and what each package can and cannot do, will be covered during the practical exercises. It is, therefore, expected that the teaching plan for the Unit will follow a sequential pattern, commencing with Outcome 1 and progressing numerically to Outcome 3. However this order is not compulsory and presenting centres may choose to deliver and assess Outcomes in a different order to suit local needs, and it is anticipated that work on Outcome 4 will run concurrently with the other 3 Outcomes.

While teaching will necessarily focus on a specific product, candidates should be made aware that alternative products are available and should be encouraged to explore these alternatives.

The actual distribution of time between Outcomes is at the discretion of the centre. However one possible distribution of time is:

Outcome 1	8 hours
Outcome 2	8 hours
Outcome 3	16 hours
Outcome 4	8 hours

The allocated timings allow for assessment and re-assessment where required.

OPPORTUNITIES FOR DEVELOPING CORE SKILLS

This Unit involves candidates:

- using a range of *IT* and carrying out searches to extract and present relevant information which may which may provide an opportunity to gather evidence towards aspects of the *IT* Core Skill
- making selective use of *IT* and evaluating their choice, which may provide an opportunity to gather evidence towards aspects of the *Problem Solving* Core Skill
- reporting a number of aspects of the assessment, which may provide an opportunity to gather evidence towards aspects of the *Communication* Core Skill

National Unit Specification: support notes (cont)

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GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

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 communications 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).*

Outcome 1

The candidate is required to produce product and/or electronic evidence that they have satisfactorily achieved all of the Performance Criteria for Outcome 1. This could be achieved by the candidate successfully completing two word processing assignments. These would be based on engineering related documents, as follows:

- making amendments to, saving and printing an existing document
- creating a document from scratch, to a required set of organisational standards or supplied template, saving and printing this document
- poof reading and spell checking the documents produced in both exercises

The assignments should allow the candidate to demonstrate competence in using **six** of the elements listed below:

- Bullets and numbering
- Columns, including use of column breaks
- Formatting features
- Headers and footers — including page numbering, dates
- Inserting characters and symbols
- Insert and format graphics and text effects
- Password protection for file
- Table creation and manipulation

National Unit Specification: support notes (cont)

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Outcome 2

The candidate is required to produce product and/or electronic evidence that they have satisfactorily achieved all of the Performance Criteria for Outcome 2. This could be achieved this by the candidate successfully completing two spreadsheet assignments, based on engineering related applications.

The spreadsheet assignments must allow the candidate to successfully perform **six** tasks from the following category list:

- Absolute and relative cell references
- Functions — general, logical, financial, statistical
- Graphs and charts — any type. Data must be used from non adjacent cell ranges
- Printing options — print gridlines, plus row and column headings
- Copy and paste cells (within spreadsheets)
- Headers and footers
- Protection and locked cells
- Formatting features:
  - cells — such as colour, shading, borders
  - pages — such as headers and/or footers

The spreadsheet assignments must also allow candidates to demonstrate competence in:

- Adding provided data to a partially complete spreadsheet
- Amending and correcting entries in a spreadsheet
- Extracting information from a spreadsheet, to satisfy provided criteria
- Saving the completed spreadsheet
- Printing:
  - the complete spreadsheet
  - a specified section of the spreadsheet

Outcome 3

The candidate is required to produce product and/or electronic evidence that they have satisfactorily achieved all of the Performance Criteria for Outcome 3. This could be achieved by the candidate successfully completing a series of activities, using the chosen engineering software package.
A centre delivering this Unit will use their own preferred engineering software package. However, the candidate will be required to demonstrate that they have successfully:

- input data to the package in existing or imported files
- process data to an agreed set of criteria/conditions relevant to the software used
- output the results of the processing — by saving the processed results and producing hard copy of these results

National Unit Specification: support notes (cont)

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Outcome 4

Hard copy or electronic evidence supplemented by an assessor observation checklist is required to demonstrate that the candidate has achieved Outcome 4 to the standard specified in the Outcomes and Performance Criteria. This evidence will be gathered under supervised open-book conditions. The evidence may be produced over an extended period of time.

The assessment instrument will be a practical assignment and candidates are required to demonstrate that they can:

- locate two web pages that contain information relating to different contexts, for two given topics
- navigate websites using browser controls
- review sources and information to help choose what is most relevant, and to decide when sources and information have been found
- save (download) pages found during the searches to an appropriate folder(s)
- provide written and/or oral recorded evidence of the search strategy
- adhere to the rules of 'netiquette'
- acceptable use policies for communicating

It may be appropriate for some of the evidence for this Unit to be produced using e-assessment provided the national standard is applied and the conditions of assessment are consistent for all candidates. This may take the form of e-testing (for knowledge and understanding) and/or e-portfolios (for practical tasks/assignments).

CANDIDATES WITH DISABILITIES AND/OR ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* **(www.sqa.org.uk)**.