

National Unit Specification: general information

UNIT Engineering Skills: Electrical/Electronic (Intermediate 1)

CODE F19D 10

COURSE Engineering Skills (Intermediate 1)

SUMMARY

This Unit is a mandatory Unit of the Intermediate 1 *Engineering Skills* Course. The Unit is suitable for candidates with no previous electrical, electronic or employment experience. The candidate will learn to select and safely use the correct tools and components required to construct a basic extra low voltage functional circuit. The circuit can be electrical, electronic or a combination of both. The circuit could include lamp holders, switches, sockets, resistors, capacitors, inductors and semi-conductor devices.

Candidates will have the opportunity to review the employability skills they have developed across the range of practical experiences.

The Unit forms part of the *Engineering Skills (Intermediate 1)* Course but can also be taken as a free-standing Unit.

The primary target group for this Unit is school candidates in S3 and above.

OUTCOMES

- 1 Identify, select and use a range of hand tools to terminate cables and test electrical/electronic cables/components.
- 2 Identify and use simple electrical/electronic components.
- 3 Construct and test a simple circuit.
- 4 Review and evaluate own employability skills in practical engineering contexts.

RECOMMENDED ENTRY

Entry is at the discretion of the centre.

Administrative Information

Superclass: XJ

Publication date: April 2007

Source: Scottish Qualifications Authority

Version: 01

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National Unit Specification: general information (cont)

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CREDIT VALUE

1 credit at Intermediate 1 (6 SCQF credit points at SCQF level 4*).

**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

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

Opportunities for developing aspects of Core Skills are highlighted in *Guidance on Learning and Teaching Approaches for this Unit*.

National Unit Specification: statement of standards

UNIT Engineering Skills: Electrical/Electronic (Intermediate 1)

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 the Scottish Qualifications Authority.

OUTCOME 1

Identify, select and use a range of hand tools to terminate cables and test electrical/electronic cables/components.

Performance Criteria

- (a) Identify and state the use of cables/components used in electrical/electronic circuits correctly.
- (b) Identify and safely use hand tools correctly.
- (c) Terminate cables correctly.
- (d) Complete a quality check to ensure cable continuity and integrity.
- (e) Safe working practices are correctly observed in all activities.

OUTCOME 2

Identify and use simple electrical/electronic components.

Performance Criteria

- (a) Identify and state accurately the use of basic electrical/electronic components.
- (b) Safely fit basic electrical/electronic components correctly from a given specification.
- (c) Ensure the security and integrity of fitted basic electrical/electronic components.
- (d) Safe working practices are correctly observed in all activities.

OUTCOME 3

Construct and test a simple circuit.

Performance Criteria

- (a) Construct a circuit from given diagrams correctly.
- (b) Complete a quality check to test and record the circuit function.
- (c) Safe working practices are correctly observed in all activities.

OUTCOME 4

Review and evaluate own employability skills in practical engineering contexts.

Performance Criteria

- (a) Review and evaluate own employability skills.
- (b) Seek and record feedback on own performance in employability skills.
- (c) Make a judgement on own strengths, weaknesses and learning points in relation to employability skills.
- (d) Identify action points for improvement in relation to employability skills.

National Unit Specification: statement of standards (cont)

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EVIDENCE REQUIREMENTS FOR THIS UNIT

Performance and written/oral evidence is required to show that all Outcomes and Performance Criteria have been achieved.

Performance evidence will be supported by assessor checklists. This evidence will be generated from an integrated assignment consisting of practical activities carried out in supervised workshop conditions.

The evidence may be gathered at different points throughout the Unit.

The practical activities involved in the preparation planning and construction of an extra low voltage electrical/electronic circuit **in a safe manner**, should conform to current legislation and will cover:

- ◆ interpretation of simple diagrams and specifications
- ◆ cable identification: single core, multi core, twin and earth, screened, co-axial and ribbon
- ◆ termination of cables: crimp, solder and clamp

- ◆ selection, function and use of any four of the following tools required to cut and terminate cables:
 - screwdrivers (various)
 - wire strippers
 - wire cutters
 - pliers
 - crimping tool
 - solder irons and circuit assembly aids

- ◆ completion of the circuit from any three of the following securely fitted components:
 - switches
 - lamp holders
 - protective device
 - resistors, capacitors
 - inductors
 - diodes
 - transistors and audio/visual devices

- ◆ completion of the circuit using one or more securely fitted cables from the following:
 - single core
 - multi core
 - twin and earth
 - screened
 - co-axial and ribbon

The circuit should be tested and the results recorded using a suitable instrument to test continuity.

Candidates will be required to carry out a quality check before submitting their work for final assessment.

National Unit Specification: statement of standards (cont)

UNIT Engineering Skills: Electrical/Electronic (Intermediate 1)

Written/oral evidence

Candidates will complete a self-evaluation review of their own performance against the following employability skills:

- ◆ maintaining good time-keeping
- ◆ maintaining good attendance
- ◆ sourcing and use of tools in a correct and safe manner
- ◆ using tools solely for the purpose for which they are designed
- ◆ cleaning and storing tools correctly after use
- ◆ following basic drawings and specifications
- ◆ showing health and safety awareness, positive attitude to learning

A signed record of the review must be retained by the assessor as assessment evidence.

The National Assessment Bank item (NAB) for this Unit provides an appropriate practical assignment, an appropriate candidate review sheet and assessor checklists. These exemplify the national standard. Centres wishing to develop their own assessments should refer to the NAB to ensure a comparable standard.

National Unit Specification: support notes

UNIT Engineering Skills: Electrical/Electronic (Intermediate 1)

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 covers practical electrical/electronic activities at a basic level. The candidate will develop the ability to select and use tools correctly and safely in the different activities in the Unit. It is therefore important that the learning takes place in a supervised workshop environment. Basic safe working practices will be included in the content as it is important that candidates learn to adhere to these at all times.

Candidates will work on a range of practical electrical/electronic tasks, which will enable them to become familiar with a variety of tools and materials in the workshop. Lecturers/teachers may include a wide range of short practical activities to equip candidates with the skills necessary to complete an electrical/electronic circuit. During the process of practical work the candidate will become accustomed to electrical/electronic terminology and will be able to demonstrate a basic knowledge and understanding of the terminology in everyday practice. Candidates should learn good working practices at each stage and how to carry out quality checks on their own work.

This Unit provides opportunities to develop engineering employability skills such as:

- ◆ maintaining good time-keeping
- ◆ maintaining good attendance
- ◆ maintaining a tidy workplace
- ◆ following instructions
- ◆ seeking advice
- ◆ working co-operatively with others
- ◆ sourcing and use of tools in a correct and safe manner
- ◆ using tools solely for the purpose for which they are designed
- ◆ cleaning and storing tools correctly after use
- ◆ recognising common materials
- ◆ showing health and safety awareness
- ◆ wearing appropriate personal protective equipment
- ◆ preparing appropriately to carry out tasks
- ◆ following basic drawings and specifications
- ◆ checking own work
- ◆ identifying own strengths and weaknesses
- ◆ identifying learning points from practical experiences
- ◆ positive attitude to learning

In this Unit candidates will perform simple calculations and take measurements. These activities provide good opportunities to develop the Core Skill of Numeracy. Candidates will also share workspace, tools and equipment, and this will provide them with a good context in which to learn to work co-operatively with others.

