

National Unit Specification: general information

UNIT Engineering Skills: Fabrication (Intermediate 1)

CODE F19F 10

COURSE Engineering Skills (Intermediate 1)

SUMMARY

This Unit is a mandatory Unit of the *Engineering Skills (Intermediate 1)* Course. The Unit is suitable for candidates with no previous engineering or employment experience. The candidate will learn to select the correct tools, materials and equipment required to manufacture an artefact using cutting, hot and cold forming, and mechanical and thermal joining techniques. These will include bolting, riveting, screwing, soldering, Metal Active Gas (MAG) welding and the use of adhesives.

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 materials, cutting and forming tools and equipment.
- 2 Identify, select and use joining tools and equipment.
- 3 Manufacture an artefact using fabrication techniques.
- 4 Review and evaluate own employability skills in practical engineering contexts.

RECOMMENDED ENTRY

Entry is at the discretion of the centre.

Administrative Information

Superclass: XH

Publication date: April 2007

Source: Scottish Qualifications Authority

Version: 01

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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: Fabrication (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 materials, cutting and forming tools and equipment.

Performance Criteria

- (a) Identify common engineering materials and a reason for use.
- (b) Identify, select and safely use cutting tools and equipment correctly.
- (c) Identify, select and safely use a range of cold forming tools and equipment correctly.
- (d) Identify, select and safely use a range of hot forming tools and equipment correctly.
- (e) Safe working practices are correctly observed in all activities.

OUTCOME 2

Identify, select and use joining tools and equipment.

Performance Criteria

- (a) Identify, select and safely use a range of mechanical joining tools and equipment correctly.
- (b) Identify, select and safely use a range of thermal joining tools and equipment correctly.
- (c) Identify, select and safely use a range of engineering adhesives correctly.
- (d) Safe working practices are correctly observed in all activities.

OUTCOME 3

Manufacture an artefact using fabrication techniques.

Performance Criteria

- (a) Produce an artefact from given working drawings and material specifications correctly.
- (b) Functional dimensions are within specified tolerances.
- (c) The quality and finish of the completed artefact complies with the specification.
- (d) Safe working practices are correctly observed in all activities.
- (e) Complete a quality check on own finished artefact.

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 in the preparation planning and manufacture of an artefact in a safe manner will cover:

- ◆ identification, selection and reason for use of common engineering materials
- ◆ interpretation of simple engineering drawings and specifications
- ◆ using non-thermal cutting techniques to shape and trim materials

- ◆ selection, function and use of any three of the following hot forming tools to form shapes and components:
 - heat source
 - anvil
 - vice
 - formers
 - hammers

- ◆ selection, function and use of any one of the following hot forming techniques to form shapes and components to:
 - bend
 - twist
 - draw down
 - flatten

- ◆ selection, function and use of any two of the following cold forming tools to form shapes and components:
 - mallets
 - stakes
 - rolls and folders

- ◆ using a minimum of any two of the following materials:
 - Low carbon steel
 - Tin plate
 - Aluminium
 - Non-metallic

National Unit Specification: statement of standards (cont)

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- ◆ complete each of the following joining techniques:
 - riveting (pop or solid)
 - bolting or screwing
 - thermal joining (MAG welding or soldering)
 - adhesives (any recognised engineering adhesive)

- ◆ the safe and correct use of adhesives should be included in the checklist

Dimensions must be within the stated tolerance as expressed in the National Assessment Bank (NAB) material.

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

Written/oral evidence

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

- ◆ maintaining good attendance
- ◆ maintaining a tidy workplace
- ◆ sourcing and use of tools in a correct and safe manner
- ◆ using tools solely for the purpose for which they are designed
- ◆ wearing appropriate personal protective equipment
- ◆ showing health and safety awareness
- ◆ positive attitude to learning
- ◆ preparing appropriately to carry out tasks

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.

