

**ENGINEERING SKILLS**  
**Intermediate 1**

**First edition — April 2007**

## National Course Specification

### Engineering Skills (Intermediate 1)

**COURSE CODE**     **C243 10**

#### COURSE STRUCTURE

This Course has four mandatory Units.

The mandatory Units are:

<b>F19C 10</b>	<b><i>Engineering Skills: Mechanical</i></b>	<b><i>1 credit</i></b>	<b><i>(40 hours)</i></b>
<b>F19D 10</b>	<b><i>Engineering Skills: Electrical/Electronic</i></b>	<b><i>1 credit</i></b>	<b><i>(40 hours)</i></b>
<b>F19F 10</b>	<b><i>Engineering Skills: Fabrication</i></b>	<b><i>1 credit</i></b>	<b><i>(40 hours)</i></b>
<b>F19H 10</b>	<b><i>Engineering Skills: Manufacture and Assembly</i></b>	<b><i>1 credit</i></b>	<b><i>(40 hours)</i></b>

To achieve the Course award the candidate must successfully achieve all the Units which make up the Course.

#### RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following, or equivalent:

- ◆ an interest in engineering
- ◆ an ability to work in numeracy and literacy at SCQF level 3
- ◆ some aptitude for graphical forms of communication

#### PROGRESSION

This Course or its Units may provide progression to:

- ◆ Scottish Progression Award in Engineering (Intermediate 2)
- ◆ SVQs and Modern Apprenticeships in Engineering areas
- ◆ relevant programmes in further education colleges
- ◆ suitable training/employment

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#### Administrative Information

**Publication date:** April 2007

**Source:** Scottish Qualifications Authority

**Version:** 01

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## **National Course Specification: (cont)**

**COURSE**      Engineering Skills (Intermediate 1)

### **CREDIT VALUE**

The Intermediate 1 Course in Engineering Skills is allocated 24 SCQF credit points at SCQF level 4\*.

*\*SCQF points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification 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 or Core Skills components in this Course.

Opportunities for developing aspects of Core Skills are highlighted in the Support Notes of the Unit Specifications for this Course.

### **LINKS TO NATIONAL OCCUPATIONAL STANDARDS**

National Occupational Standards (NOS) are developed by the key employment sectors of the United Kingdom. These standards set the competences required for job roles within a particular employment sector.

The Course *Engineering Skills (Intermediate 1)* has been designed to link broadly to National Occupational Standards, but the standards required of first-year apprentices in the Engineering Industry are significantly more onerous than those in this Course.

Compared to Occupational Standards, this Course requires either reduced scale and complexity, or more achievable tolerances, and therefore provides a useful preparation for employment or further training in the engineering industry. The general tolerance required for the practical activities in this course should be  $\pm 3\text{mm}$ . The specific tolerances required for practical Unit assessments are specified in the National Assessment Bank items (NABs).

## National Course Specification: Course details (cont)

**COURSE**     Engineering Skills (Intermediate 1)

### RATIONALE FOR SKILLS FOR WORK COURSES

Skills for Work Courses are designed to help candidates to develop:

- ◆ skills and knowledge in a broad vocational area
- ◆ Core Skills
- ◆ an understanding of the workplace
- ◆ positive attitudes to learning
- ◆ skills and attitudes for employability

A key feature of these Courses is the emphasis on *experiential learning*. This means learning through practical experience and learning by reflecting on experience.

#### Learning through practical experience

- ◆ Teaching/learning programmes should include some or all of the following:
  - learning in real or simulated workplace settings
  - learning through role play activities in vocational contexts
  - carrying out case study work
  - planning and carrying out practical tasks and assignments

#### Learning through reflecting at all stages of the experience

- ◆ Teaching/learning programmes should include some or all of the following:
  - preparing and planning for the experience
  - taking stock throughout the experience — reviewing and adapting as necessary
  - reflecting after the activity has been completed — evaluating and identifying learning points

The Skills for Work Courses are also designed to provide candidates with opportunities for developing *Core Skills* and enhancing skills and attitudes for *employability*.

#### Core Skills

The **five** Core Skills are:

- ◆ Communication
- ◆ Numeracy
- ◆ Information Technology
- ◆ Problem Solving
- ◆ Working with Others

## National Course Specification: Course details (cont)

### COURSE     Engineering Skills (Intermediate 1)

#### Employability

The skills and attitudes for employability, including self-employment, are outlined below:

- ◆ *generic skills/attitudes valued by employers*
  - understanding of the workplace and the employee's responsibilities, for example time-keeping, appearance, customer care
  - self-evaluation skills
  - positive attitude to learning
  - flexible approaches to solving problems
  - adaptability and positive attitude to change
  - confidence to set goals, reflect and learn from experience
  
- ◆ *specific vocational skills/knowledge*
  - Course Specifications highlight the links to National Occupational Standards in the vocational area and identify progression opportunities

Opportunities for developing these skills and attitudes are highlighted in each of the Course and Unit Specifications. These opportunities include giving young people direct access to workplace experiences or, through partnership arrangements, providing different learning environments and experiences which simulate aspects of the workplace. These experiences might include visits, visiting speakers, role play and other practical activities.

*A Curriculum for Excellence* (Scottish Executive 2004) identifies aspirations for every young person. These are that they should become:

- ◆ successful learners
- ◆ confident individuals
- ◆ responsible citizens
- ◆ effective contributors

The learning environments, the focus on experiential learning and the opportunities to develop employability and Core Skills in these Courses contribute to meeting these aspirations.

## National Course Specification: Course details (cont)

### COURSE      Engineering Skills (Intermediate 1)

#### RATIONALE FOR INTERMEDIATE 1 ENGINEERING SKILLS COURSE

The *Intermediate 1 Engineering Skills* Course has been designed to provide a basis for progression into further education or for moving directly into training in employment within an engineering sector. The overall purpose of the Course is to ensure that candidates start to develop the generic and practical skills, knowledge and understanding and employability skills needed within an engineering sector.

The engineering sector includes the following:

Mechanical	Manufacture	Maintenance
Fabrication	Welding	Electrical
Electronic	Foundry	Automotive
Servicing	Transport	Aeronautical
Communications	Space	Energy Generation
Conservation	Marine	Water
Salination	Oil/Gas	Petroleum

This Course focuses on the four broad areas of Mechanical, Electrical/Electronic, Fabrication and Manufacture. This will allow the candidates to gain basic transferable skills which can be applied to any of the above engineering areas.

The primary target group for this Course is school candidates in S3 and above. It is anticipated that, for this group of candidates, the Course will rely on and build on existing partnerships between schools and colleges and employers (or other agencies). This may be particularly pertinent in the case of the Engineering Skills course due to the specialist expertise and facilities available in, for example, further education colleges and with training providers. Nevertheless, the Engineering Skills course is designed at a level and scope such that it can be delivered in schools, if the school has suitable facilities and teaching expertise. A partnership approach would still be necessary in order to provide the contact with the workplace which is an essential part of the experience for candidates. The Course is also suitable for adult candidates who are seeking to enhance their employability and develop introductory vocational skills in an engineering sector.

## National Course Specification: Course details (cont)

### COURSE      Engineering Skills (Intermediate 1)

The general aims of the *Engineering Skills (Intermediate 1)* Course are to:

- ◆ widen participation in vocationally-related learning for school candidates from S3 upwards
- ◆ allow candidates to experience vocationally-related learning
- ◆ provide candidates with a broad introduction to the engineering vocational sector
- ◆ encourage candidates to foster a good work ethic, including time-keeping, a positive attitude and other relevant employability skills
- ◆ provide opportunities to develop a range of Core Skills in a vocational context
- ◆ encourage candidates to take charge of their own learning and development
- ◆ provide a range of teaching, learning and assessment styles to motivate candidates to achieve their full potential
- ◆ facilitate progression to further education and/or training
- ◆ encourage candidates to plan their work and review their progress
- ◆ encourage candidates to develop a positive attitude to waste minimisation and environmental issues

In particular, the aims of the *Engineering Skills (Intermediate 1)* Course are to:

- ◆ encourage candidates to consider a career in the engineering industry
- ◆ develop an awareness of the opportunities there may be within engineering in terms of the types and range of career options
- ◆ enable candidates to develop and apply practical, technical and communication skills as a foundation for future learning and progression
- ◆ develop the candidates' awareness of their individual strengths and weaknesses in relation to the requirements of engineering, and to reflect on how this affects their employability potential
- ◆ give candidates the technical knowledge, skills and understanding associated with a range of skills in engineering at this level
- ◆ encourage candidates to apply their knowledge and understanding of engineering by using skills of evaluation and problem-solving in a vocational context
- ◆ develop an awareness that health and safety issues are integral to the world of work generally and engineering in particular
- ◆ prepare candidates for further learning opportunities, study and training for employment in engineering and related occupations

The Course *Engineering Skills (Intermediate 1)* has been designed with National Occupational Standards in mind. There is a link, though not directly, to these Standards. The standards required of first-year apprentices in the engineering industry are, and should remain, significantly more onerous than those for this Course, which is at an introductory level.

While no formal entrance qualifications are required for this Course, it would be expected that candidates embarking on the Course would have the following:

- ◆ basic proficiency in literacy
- ◆ basic proficiency in numeracy
- ◆ some aptitude for graphical forms of communication (the reading of basic engineering drawings is developed in the Course)
- ◆ motivation to work as part of a team

## National Course Specification: Course details (cont)

### **COURSE**      Engineering Skills (Intermediate 1)

This Course supports progression into appropriate further education or training in employment. The Course provides the basis for candidates to gain an insight into engineering occupations such as Mechanical, Fabrication, Automotive, Aeronautical, Electrical/Electronic, Marine, and to use their studies to help them decide the career they wish to follow. Candidates studying this Course in Engineering and choosing a skills option, may be aiming to progress into an apprenticeship in industry. Candidates who are uncertain which trade to follow may undertake vocational courses at Further Education colleges.

The Intermediate 1 Course should facilitate progression to a relevant Intermediate 2 Course or an appropriate National Certificate programme.

### **COURSE CONTENT**

#### **Summary of Course content**

This Course comprises four 40-hour Units. The content of the Course focuses on the development of basic hand skills across the disciplines of Mechanical, Electrical/Electronic, Fabrication and Manufacture and Assembly. Central to the content are the generic employability skills valued by employers in an engineering sector. These skills are developed in each of the four Units and are assessed at least twice during the course. These add value to the development of the specific vocational skills.

All the *Engineering Skills* Units, while focusing on specific skill areas, also address generic skills related to:

- ◆ engineering communications
- ◆ engineering materials
- ◆ measurement and marking
- ◆ working to tolerances
- ◆ Core Skills

The *Engineering Skills* Units also include Employability Skills outlined below:

- ◆ time-keeping and attendance
- ◆ positive attitudes to learning
- ◆ responding positively to advice and feedback
- ◆ following instructions
- ◆ working co-operatively with others
- ◆ health and safety awareness
- ◆ necessary preparation planning
- ◆ checking own work
- ◆ problem solving



## National Course Specification: Course details (cont)

### COURSE      Engineering Skills (Intermediate 1)

#### Unit assessment

##### All Units

In all of the Units, which focus on the development of specific engineering skills, assessment follows a similar pattern involving a range of practical activities which will produce evidence for all the Outcomes. The evidence will be confirmed by the use of an assessor checklist, which will cover:

- ◆ interpretation of a drawing or specification
- ◆ the appropriate use of tools, materials and equipment
- ◆ successful involvement in the completion of a task, product or assembly
- ◆ quality checking of their work by the candidate
- ◆ attention to health and safety aspects of working in a workshop type of environment

The assessment of employability skills is integrated in all of the Units and is based on assessor checklists and the completion of a candidate review sheet on four different occasions throughout the Course. This review allows the candidate to record development of employability skills in the context of different skill areas.

Further details about Unit assessment for this Course can be found in the Unit Specifications and the National Assessment Bank (NAB) materials.

#### QUALITY ASSURANCE

The Units of all National Courses are subject to internal verification and may also be chosen for external verification by SQA. This is to ensure that national standards are being applied across all subjects.

To assist centres, Senior Verifier reports are published on SQA's website [www.sqa.org.uk](http://www.sqa.org.uk).

#### GUIDANCE ON LEARNING/TEACHING AND ASSESSMENT APPROACHES FOR THIS COURSE

The Course has four mandatory Units which offer a broad range of different engineering experiences. It is recommended that the Unit *Engineering Skills: Mechanical (Intermediate 1)* is attempted and completed initially as some aspects of the content of this Unit are incorporated in all of the other Course Units. The *Engineering Skills: Manufacture and Assembly (Intermediate 1)* Unit should only be attempted after successful completion of the other three Units.

It is important that a well planned induction to the Course is delivered, emphasising its integrated nature and stressing the importance of generic employability skills throughout.

Employability skills should span the Course, allowing candidates ample opportunity to develop and review employability skills and attitudes over a range of engineering skills and over a reasonable period of time.

## **National Course Specification: Course details (cont)**

### **COURSE      Engineering Skills (Intermediate 1)**

#### **Learning and Teaching**

The Course has been designed to ensure that candidates learn through practical experiences. The main focus in each of the skills specific Units is on practical work. General vocational skills, such as selecting and maintaining tools and equipment, are integrated with practical engineering activities within the Units.

Health and safety is integral to all practical tasks and should be emphasised at the start of and throughout each lesson.

Brief lessons on workshop protocol should also be included.

Teaching and learning approaches will include demonstrations of practical work by tutors. Short lessons on specific aspects of industrial practice and the correct use of tools will prove invaluable at intervals throughout the learning experience. These may be followed by brief practical sessions in which the candidates practise the skill emphasised by the demonstration. Given the practical nature of teaching/learning and assessment, centres should ensure that teaching blocks are of sufficient time to allow a meaningful experience for candidates.

Reflecting on practical experiences and learning from them is an approach that is embedded in the Course. Throughout the learning experiences, the emphasis should be on helping candidates to develop an awareness of the employability skills and attitudes needed for the engineering industry, for example, good time-keeping, co-operating with others, taking instructions, and a positive attitude to learning. Opportunities to develop these skills and attitudes arise naturally in the work of the Course. Candidates should be aware that these generic skills are just as important as the practical engineering skills they are developing.

For example, it is important for workshop activities to be carried out to effective schedules; candidates will have opportunities to demonstrate good time-keeping in the context of these schedules. Candidates will have to co-operate with others regarding shared workspace, tools and equipment. They will have to co-operate and communicate regarding the transfer of materials, tools and equipment safely around and across the workshop. Candidates will be encouraged to develop a positive attitude to waste minimisation and environmental issues regarding the use of materials.

The work of the Course will increase awareness that health and safety issues are important in the world of work generally and in engineering in particular.

In carrying out engineering activities, candidates will learn that there are correct and incorrect ways to use tools and equipment. Tutors will have ample opportunity to demonstrate good practice and correct procedures to candidates, who will learn the importance to self and others of following instructions. Such positive experiences will foster a positive attitude to learning.

Teaching and learning approaches should impart enthusiasm and help to inform candidates of realistic prospects in the engineering sector or in industry generally. They should become aware of steps to employment or further training. Through their experiences of the various practical skills in the Course, they should become better equipped to make valid personal choices regarding careers and further study.

## National Course Specification: Course details (cont)

### **COURSE**      Engineering Skills (Intermediate 1)

Opportunities to develop aspects of Core Skills should be used where they arise naturally. For example, in order to carry out engineering activities in a workshop environment, candidates will develop aspects of numeracy when making engineering calculations and taking measurements. They will also have to communicate simple engineering terms with tutors and fellow candidates regarding skills practices, materials and tools, health and safety and working together in the workplace. Aspects of problem solving will arise through their participation in practical work.

Teaching and learning approaches should encourage candidates to take responsibility for their own learning and development. In the practical Units of the Course, candidates need to carry out quality checks on their own work. This provides a good opportunity to motivate candidates to take pride in their work. The integration of Employability skills, in particular self-evaluation skills will allow candidates to take responsibility for seeking feedback and identifying action points for improvement in their own performance. This should help to develop confidence in taking advice and in asking for direction and assistance where necessary.

#### **Preparation for practical activities, visiting speakers, visits**

Throughout the Course, the need for correct preparation for practical activities should be stressed. However, such preparation should not take excessive time to complete. Teaching correct skills practice, effective use of tools and equipment and a positive view of health and safety should help to ensure that preparation for practical work is comprehensive.

Candidates will require supervision during practical work — both on a skills level and for health and safety reasons. The learning environment should be designed to minimise risks and provide a safe context for carrying out tasks. For example, when undertaking the task of Metal Active Gas (MAG) welding candidates should be made aware of the risk from fire, fumes and harmful rays to themselves and others.

It is recommended that each practical session be preceded by a ‘tool box’ talk on an aspect of health and safety relevant to the work in hand. It is recommended that candidates be given regular but short practice sessions in the correct use of the materials to be used in each session as well as coaching in the correct use of associated tools and equipment.

Centres are encouraged to establish links with local industry. Local engineering companies, trades associations, Sector Skills Councils (SSCs), Institutes and Chambers of Commerce may be prepared to offer support, for example, in the form of visits from representatives of their organisations. Visitors from industry will be able to give candidates a realistic view of jobs and conditions in the engineering industry.

It may be possible for centres to arrange visits to engineering works as part of the candidates’ learning experience. Visits to local industry are often particularly useful because work in progress will be at different stages and candidates can see various different trades working at the same time. Industrial visits should be carefully arranged, organised and authorised. It would be preferable for those responsible for such visits to have prior knowledge of the industry in question.

## National Course Specification: Course details (cont)

### COURSE     Engineering Skills (Intermediate 1)

#### Approaches to assessment

Approaches to assessment that promote the efficient and effective gathering of evidence are to be encouraged.

The development and assessment of generic Employability Skills is a key feature of this Course and is integrated with the skills specific Units. Candidates can readily gather evidence for assessment during their work in these practical skills Units. Reviewing progress with engineering employability skills and attitudes will take place in the practical context of work in the different activities. Candidates will complete a minimum of four review sheets in the different trade activities. Assessment of interpreting drawings and specifications and materials should also take place during the work in skills-specific practical Units. An employability skills profile for the Course is included in the Appendix and this gives a clear indication of where assessment evidence is gathered for generic employability skills.

Within the skills-specific practical Units, the candidate will produce evidence as a natural part of the learning and teaching process. Candidates will first learn and practise the correct techniques and methods for each of the skills they undertake. Assessment of the various practical tasks will take place at appropriate points throughout the Course, allowing time for candidates to make quality checks of their finished products against the prescribed tolerances, before being submitted for assessment.

In the *Engineering Skills: Manufacture and Assembly* Unit candidates **can if appropriate** work in teams of no more than three to manufacture and assemble an artefact. It is expected that the artefact produced by such a team will be of sufficient complexity and scope to allow all members of the team to make a contribution equal to the manufacture and assembly of an artefact by an individual candidate. The artefact manufactured by a team can be, for example, a community-based project for the school, college or a youth group. Where this occurs each candidate must identify their contribution to the completion of the task and present evidence to satisfy the assessor that all Outcomes and Performance Criteria have been met.

#### Health and Safety

Risk assessment and compliance with health and safety legislation is of paramount importance in this Course. Owing to the health and safety implications involved in working in Engineering, the Units have been designed so that they can be taught and assessed in a workshop environment.

It is the centre's responsibility to produce risk assessments which set out the safe working/teaching and learning arrangements for teachers, support staff and candidates. Centres will need to be familiar with the requirements of the Health & Safety at Work Act, The Management of Health & Safety at Work Regulations, Control of Substances Hazardous to Health, Provision and Use of Work Equipment Regulations and other legislative requirements where risk assessments are required. (This list of statutes is not intended to be exhaustive, and centres must comply with all current relevant legislation whether listed or otherwise.)

## **National Course Specification: Course details (cont)**

### **COURSE      Engineering Skills (Intermediate 1)**

The Course in *Engineering Skills (Intermediate 1)* requires access to safe and suitably equipped, classrooms, workshops or work areas to deliver and assess the vocational skill options. These workshops or work areas should be of an appropriate size and have sufficient tools, equipment and resources to deliver and assess the Units for the number of learners in the class group. This may take the form of a combined workshop/project area divided into suitable work areas for each skill, or separate workshops. Storage areas for materials and personal protective equipment (PPE) should also be provided. It is recognised that some centres will not have facilities available to deliver all of the options in these qualifications; in these cases, appropriate partnership arrangements would provide the learning environments and/or expertise necessary to deliver the Course. Liaison and agreements regarding health and safety and safe systems of work would be a priority for partners involved.

### **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 this Course. 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](http://www.sqa.org.uk)).

## National Course Specification: Course details (cont)

**COURSE**      Engineering Skills (Intermediate 1)

**Appendix:**    Employability Skills Profile

In addition to the specific, vocational skills developed and assessed in this Course, employability skills are addressed as detailed in the table below. For the purposes of the table, the Units are referred to as A, B, C and D as indicated.

<b>Engineering Skills: Mechanical</b>	= A
<b>Engineering Skills: Electrical/Electronic</b>	= B
<b>Engineering Skills: Fabrication</b>	= C
<b>Engineering Skills: Manufacture and Assembly</b>	= D

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

### Assessment evidence in all Units:

Assessor observation checklists of practical activities and candidate review sheets.

## National Unit Specification: general information

**UNIT** Engineering Skills: Mechanical (Intermediate 1)

**CODE** F19C 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 and use the correct tools, equipment and materials required to manufacture an artefact(s). The candidate will also develop and use basic engineering fitting skills including:

- ◆ measuring, marking, cutting, shaping, drilling and tapping

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 and use tools to measure and mark selected engineering materials.
- 2 Identify, select and use a range of metal working hand tools.
- 3 Manufacture an artefact(s) from simple working drawings.
- 4 Review and evaluate own employability skills in practical engineering contexts.

### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

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#### Administrative Information

**Superclass:** XH

**Publication date:** April 2007

**Source:** Scottish Qualifications Authority

**Version:** 01

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## **National Unit Specification: general information (cont)**

### **UNIT**    Engineering Skills: Mechanical (Intermediate 1)

#### **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: Mechanical (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 and use tools to measure and mark selected engineering materials.

##### **Performance Criteria**

- (a) Identify common engineering materials and state a reason for use.
- (b) Identify a range of basic measurement tools correctly and clearly state their function.
- (c) Mark out workpieces accurately from simple drawings and material specifications.
- (d) Complete a quality check to ensure marked dimensions are within specified tolerances.
- (e) Safe working practices are correctly observed in all activities.

#### **OUTCOME 2**

Identify, select and use a range of metal working hand tools.

##### **Performance Criteria**

- (a) Identify a range of metal working hand tools correctly and clearly state their function.
- (b) Select and use a range of metal working hand tools correctly for given tasks.
- (c) Safe working practices are correctly observed in all activities.

#### **OUTCOME 3**

Manufacture an artefact(s) from simple working drawings.

##### **Performance Criteria**

- (a) Produce an artefact(s) from given working drawings and material specifications.
- (b) Functional dimensions of the artefact(s) 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(s).

#### **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)

### UNIT Engineering Skills: Mechanical (Intermediate 1)

#### EVIDENCE REQUIREMENTS FOR THIS UNIT

Performance evidence 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 a reason for use of the following common engineering materials:
  - Low carbon steel
  - Brass
  - Aluminium
  - Non-metallic
  
- ◆ interpretation of simple engineering drawings, which include the drawing symbols:
  - radius
  - diameter
  - countersunk
  - centre line
  
- ◆ selection, function and use of any four of the following tools to measure and mark out:
  - rule
  - scriber
  - square
  - dividers
  - caliper
  - protractor
  - hammer and centre punch
  
- ◆ selection and use of any four of the following hand tools to cut, shape, drill and tap:
  - hammer
  - chisel
  - hacksaw
  - tin snips
  - files
  - drills
  - taps

The artefact(s) will be completed using a material selected from:

- ◆ Low carbon steel
- ◆ Brass
- ◆ Aluminium
- ◆ Non-metallic

## **National Unit Specification: statement of standards (cont)**

### **UNIT    Engineering Skills: Mechanical (Intermediate 1)**

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 time-keeping
- ◆ maintaining a tidy workplace
- ◆ seeking advice and following instructions from supervisors
- ◆ cleaning and storing tools correctly after use
- ◆ recognising common engineering materials
- ◆ showing health and safety awareness
- ◆ positive attitude to learning and wearing appropriate PPE

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: Mechanical (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 mechanical engineering 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 mechanical engineering 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 artefact. During the process of practical work the candidate will become accustomed to engineering 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.

## **National Unit Specification: support notes (cont)**

### **UNIT    Engineering Skills: Mechanical (Intermediate 1)**

The context for learning should include the requirement to be clean, presentable and appropriately dressed for the workshop, wearing personal protective equipment (PPE) including protective clothing when required.

Relevant aspects of current health and safety legislation, current COSHH (Control of Substances Hazardous to Health) Regulations and any systems of work relevant to the candidates' workshop/workplace should be explained and adhered to as part of the work of this Unit.

#### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

It is important that there is an induction to the Unit that will include employability skills and health and safety awareness. This Unit involves experiential learning through the various practical experiences and activities. Candidates should experience workshop conditions and should be encouraged to perform tasks and conduct themselves in a manner appropriate to the workplace. General vocational skills, such as selecting and maintaining tools and equipment, are integrated with practical engineering activities within the Mechanical Unit. As well as carrying out practical tasks, candidates will also learn from brief lessons on health and safety and workshop protocol. Teaching and learning approaches will also include demonstrations of practical work by tutors. Short lessons on specific aspects of industrial practice and the correct use of tools will prove invaluable at intervals throughout the learning experience. These may be followed by brief practical sessions in which the candidates practise the skill emphasised by the demonstration. Integrated into the Unit are the employability skills that employers value. It should be stressed that all the employability skills are developed in this Unit but only specified employability skills will be assessed. Employability skills are a focus of this Unit and should be promoted from Unit induction to Unit completion.

In order to raise the candidate's awareness of local industries and the realities of the workplace, visits to local engineering firms could be arranged if appropriate. Equally, visiting speakers from local engineering firms should be encouraged. Additional useful material and employment opportunities can be resourced by researching local engineering firms or from the Internet.

#### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

The Unit assessment will include both mechanical engineering skills and employability skills, and it is recommended that the stated mechanical engineering and employability skills are assessed throughout the Unit.

The mechanical engineering skills assessed in this Unit are:

- ◆ measure
- ◆ mark
- ◆ cut
- ◆ shape
- ◆ preparation planning
- ◆ select materials
- ◆ interpret simple drawings
- ◆ select tools
- ◆ manufacture to stated tolerances

## National Unit Specification: support notes (cont)

### UNIT Engineering Skills: Mechanical (Intermediate 1)

The employability skills assessed in this Unit are:

- ◆ maintain good time-keeping
- ◆ maintain a tidy workplace
- ◆ seek advice and follow instructions from supervisors
- ◆ clean and store tools correctly after use
- ◆ recognise common engineering materials
- ◆ show health and safety awareness
- ◆ work co-operatively with others
- ◆ positive attitude to learning
- ◆ wear appropriate PPE

The assessment of employability skills will be evidenced by a candidate review sheet supported with assessor observation checklists of the practical activities. It is recommended that the candidate review sheet should be completed towards the end of the Unit when the candidate and assessor will have had a reasonable time to make judgement.

The assessment of the mechanical engineering skills will be evidenced by a practical assignment involving the manufacture of an artefact (typical examples would be a bicycle spanner, a toolmaker's clamp) and these will be supported by assessor observation checklists.

It is anticipated that candidates will be given as much practice as possible in mechanical engineering techniques prior to assessment. The assessment activities should also make an important contribution to the learning process.

While evidence may be generated by the manufacture of one artefact, centres may decide to complete more than one artefact but must ensure that the Outcomes, Performance Criteria and Evidence Requirements are satisfied.

If candidates are working as a team on practical assignments, assessors must satisfy themselves that candidates are competent in each aspect of the given task.

Assessors are required to check the quality of candidates' work against prescribed standards and tolerances. Candidates themselves are required to carry out a quality check against these same standards. It is recommended that candidates must carry out their own quality check prior to the assessor check.

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.

### 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](http://www.sqa.org.uk)).

## 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.

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#### Administrative Information

**Superclass:** XJ

**Publication date:** April 2007

**Source:** Scottish Qualifications Authority

**Version:** 01

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## **National Unit Specification: general information (cont)**

**UNIT**    Engineering Skills: Electrical/Electronic (Intermediate 1)

### **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)

### UNIT Engineering Skills: Electrical/Electronic (Intermediate 1)

#### 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.

## **National Unit Specification: support notes (cont)**

### **UNIT    Engineering Skills: Electrical/Electronic (Intermediate 1)**

The context for learning should include the requirement to be clean, presentable and appropriately dressed for the workshop, wearing personal protective equipment (PPE) including protective clothing when required.

Relevant aspects of current health and safety legislation, current Control of Substances Hazardous to Health (COSHH) Regulations and any systems of work relevant to the candidates' workshop/workplace should be explained and adhered to as part of the work of this Unit.

#### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

It is important that there is an induction to the Unit that will include employability skills and health and safety awareness. This Unit involves experiential learning through the various practical experiences and activities. Candidates should experience workshop conditions and should be encouraged to perform tasks and conduct themselves in a manner appropriate to the workplace. General vocational skills, such as selecting and maintaining tools and equipment, are integrated with practical electrical/electronic activities within the Unit. As well as carrying out practical tasks, candidates will also learn from brief lessons on health and safety and workshop protocol. Teaching and learning approaches will also include demonstrations of practical work by tutors. Short lessons on specific aspects of industrial practice and the correct use of tools will prove invaluable at intervals throughout the learning experience. These may be followed by brief practical sessions in which the candidates practise the skill emphasised by the demonstration. Integrated into the Unit are the employability skills that employers value. It should be stressed that all the employability skills are developed in this Unit but only specified employability skills will be assessed. Employability skills are a focus of this Unit and should be promoted from Unit induction to Unit completion.

In order to raise the candidate's awareness of local industries and the realities of the workplace, visits to local engineering firms could be arranged if appropriate. Equally, visiting speakers from local engineering firms should be encouraged. Additional useful material and employment opportunities can be resourced by researching local engineering firms or from the Internet.

#### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

The Unit assessment will include both electrical/electronic skills and employability skills, and it is recommended that the stated electrical/electronic skills and employability skills are assessed throughout the Unit.

The electrical/electronic skills assessed in this Unit are:

- ◆ cut
- ◆ terminate
- ◆ fit components
- ◆ test
- ◆ preparation planning
- ◆ select components
- ◆ interpret simple drawings
- ◆ select tools
- ◆ construct circuit to stated tolerances

## National Unit Specification: support notes (cont)

### UNIT Engineering Skills: Electrical/Electronic (Intermediate 1)

The employability skills assessed in this Unit are:

- ◆ 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

The assessment of employability skills will be evidenced by a candidate review sheet supported with assessor observation checklists of the practical activities. It is recommended that the candidate review sheet should be completed towards the end of the Unit when the candidate and assessor will have had a reasonable time to make a judgement.

The assessment of the electrical/electronic skills will be evidenced by a practical assignment involving the construction and test of, for example, a one way lighting circuit, an electronic logic circuit, an electronic timer circuit and these will be supported by assessor observation checklists.

It is anticipated that candidates will be given as much practice as possible in electrical/electronic techniques prior to assessment. The assessment activities should also make an important contribution to the learning process.

If candidates are working as a team on practical assignments, assessors must satisfy themselves that candidates are competent in each aspect of the given task.

Assessors are required to check the quality of candidates' work against prescribed standards and test readings. Candidates themselves are required to carry out a quality check against these same standards. Candidates must carry out their own quality check prior to the assessor check.

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.

### **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](http://www.sqa.org.uk)).

## 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.

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#### Administrative Information

**Superclass:** XH

**Publication date:** April 2007

**Source:** Scottish Qualifications Authority

**Version:** 01

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## **National Unit Specification: general information (cont)**

### **UNIT**    Engineering Skills: Fabrication (Intermediate 1)

#### **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)

### UNIT Engineering Skills: Fabrication (Intermediate 1)

#### 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)

### UNIT Engineering Skills: Fabrication (Intermediate 1)

- ◆ 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.

## National Unit Specification: support notes

### UNIT Engineering Skills: Fabrication (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 fabrication 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 fabrication 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 the manufacture of an artefact. During the process of practical work the candidate will become accustomed to engineering 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 cooperatively with others.

## **National Unit Specification: support notes (cont)**

### **UNIT    Engineering Skills: Fabrication (Intermediate 1)**

The context for learning should include the requirement to be clean, presentable and appropriately dressed for the workshop, wearing personal protective equipment (PPE) including protective clothing when required.

Relevant aspects of current health and safety legislation, current Control of Substances Hazardous to Health (COSHH) Regulations and any systems of work relevant to the candidates' workshop/workplace should be explained and adhered to as part of the work of this Unit.

In particular the health and safety requirements needed during the setup and use of arc welding equipment should be stressed.

#### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

It is important that there is an induction to the Unit that will include employability skills and health and safety awareness. This Unit involves experiential learning through the various practical experiences and activities. Candidates should experience workshop conditions and should be encouraged to perform tasks and conduct themselves in a manner appropriate to the workplace. General vocational skills, such as selecting and maintaining tools and equipment, are integrated with practical fabrication activities within the Unit. As well as carrying out practical tasks, candidates will also learn from brief lessons on health and safety and workshop protocol. Teaching and learning approaches will also include demonstrations of practical work by tutors. Short lessons on specific aspects of industrial practice and the correct use of tools will prove invaluable at intervals throughout the learning experience. These may be followed by brief practical sessions in which the candidates practise the skill emphasised by the demonstration. Integrated into the Unit are the employability skills that employers value. It should be stressed that all the employability skills are developed in this Unit but only specified employability skills will be assessed. Employability skills are a focus of this Unit and should be promoted from Unit induction to Unit completion.

In order to raise the candidates' awareness of local industries and the realities of the workplace, visits to local engineering firms could be arranged if appropriate. Equally, visiting speakers from local engineering firms should be encouraged. Additional useful material and employment opportunities can be resourced by researching local engineering firms or from the Internet.

#### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

The Unit assessment will include forming, joining and employability skills, and it is recommended that the stated forming, joining and employability skills are assessed throughout the Unit.

The fabrication skills assessed in this Unit are:

- ◆ non-thermal cutting
- ◆ cold forming
- ◆ hot forming
- ◆ riveting
- ◆ bolting or screwing
- ◆ thermal joining
- ◆ adhesives
- ◆ preparation planning
- ◆ selecting materials

## National Unit Specification: support notes (cont)

### UNIT Engineering Skills: Fabrication (Intermediate 1)

- ◆ interpreting simple drawings
- ◆ selecting tools
- ◆ manufacturing to stated tolerances

The employability skills assessed in this Unit are:

- ◆ 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

The assessment of employability skills will be evidenced by a candidate review sheet supported with assessor observation checklists of the practical activities. It is recommended that the candidate review sheet should be completed towards the end of the Unit when the candidate and assessor will have had a reasonable time to make a judgement.

The assessment of the fabrication skills will be evidenced by a practical assignment involving the manufacture of an artefact. Typical examples would be a tool tray/toolbox, a cup, a funnel, and these will be supported by assessor observation checklists.

It is anticipated that candidates will be given as much practice as possible in fabrication techniques prior to assessment. The assessment activities should also make an important contribution to the learning process.

If candidates are working as a team on practical assignments, assessors must satisfy themselves that candidates are competent in each aspect of the given task.

Assessors are required to check the quality of candidates' work against prescribed standards and tolerances. Candidates themselves are required to carry out a quality check against these same standards. Candidates must carry out their own quality check prior to the assessor check.

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.

### **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](http://www.sqa.org.uk)).

## National Unit Specification: general information

**UNIT** Engineering Skills: Manufacture and Assembly (Intermediate 1)

**CODE** F19H 10

**COURSE** Engineering Skills (Intermediate 1)

### SUMMARY

This Unit is a mandatory Unit of the *Engineering Skills (Intermediate 1)* Course. The Unit integrates the mechanical, electrical/electronic and fabrication skills developed in the other mandatory Units of the course. The candidates will learn to select and use the correct tools and materials required to manufacture, test, evaluate and report their findings on the manufacture and assembly of an artefact.

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 tools, materials and equipment to manufacture an artefact.
- 2 Identify and use practical tests on the assembled artefact.
- 3 Evaluate and report on the manufacture and assembly of an artefact.
- 4 Review and evaluate own employability skills in practical engineering contexts.

### RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following, or equivalent:

*Engineering Skills: Mechanical (Intermediate 1)*

*Engineering Skills: Electrical/Electronic (Intermediate 1)*

*Engineering Skills: Fabrication (Intermediate 1)*

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### Administrative Information

**Superclass:** WB

**Publication date:** April 2007

**Source:** Scottish Qualifications Authority

**Version:** 01

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## **National Unit Specification: general information (cont)**

**UNIT**    Engineering Skills: Manufacture and Assembly (Intermediate 1)

### **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: Manufacture and Assembly (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 tools, materials and equipment to manufacture an artefact.

##### **Performance Criteria**

- (a) Identify, select and safely use a range of relevant tools, materials and equipment correctly.
- (b) Safely and correctly manufacture and assemble an artefact from simple drawings and specifications.
- (c) Complete the artefact accurately and within specified tolerances.
- (d) Safe working practices are correctly observed in all activities.

#### **OUTCOME 2**

Identify and use practical tests on the assembled artefact.

##### **Performance Criteria**

- (a) Identify and use dimensional checks on the completed artefact correctly.
- (b) Test the functional use of the completed artefact correctly.
- (c) Safe working practices are correctly observed in all activities.
- (d) Complete a quality check on own finished artefact.

#### **OUTCOME 3**

Evaluate and report on the manufacture and assembly of an artefact.

##### **Performance Criteria**

- (a) Complete an evaluation on the functionality of the artefact correctly.
- (b) Produce a report which includes a valid conclusion on the functionality of the artefact.
- (c) Communicate clearly the findings of the report on the manufacture and assembly of the artefact to a specified audience.

#### **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)**

### **UNIT    Engineering Skills: Manufacture and Assembly (Intermediate 1)**

#### **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.

Candidates can, if appropriate, work in teams of no more than three to produce an assembled artefact. It is essential that the artefact produced by such a team will be of sufficient complexity and scope to allow all members of the team to make a contribution equal to the manufacture and assembly of an artefact by an individual candidate.

Where this occurs the assessor must be satisfied that each individual candidate has produced evidence to demonstrate achievement of all Outcomes and Performance Criteria.

The practical activities in the manufacture of an artefact in a safe manner will cover:

- ◆ interpretation of drawings and specification for the given artefact
- ◆ selection and safe use of the correct tools, materials and equipment as required, to manufacture and assemble an artefact

Candidates will be required to carry out:

- ◆ dimensional checks on the completed artefact
- ◆ functionality tests on the completed artefact to check for quality, robustness, fitness for purpose before submitting their work for final assessment.

Candidates are required to:

- ◆ complete an evaluation on the functionality of the artefact using a given pro forma checklist
- ◆ complete a short report of between 150 and 400 words that includes a valid conclusion on the functionality of the artefact
- ◆ communicate the findings of the report to a peer group

## **National Unit Specification: statement of standards (cont)**

### **UNIT    Engineering Skills: Manufacture and Assembly (Intermediate 1)**

#### **Written/oral evidence**

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

- ◆ following instructions
- ◆ seeking advice
- ◆ working co-operatively with others
- ◆ showing health and safety awareness
- ◆ 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

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: Manufacture and Assembly (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 manufacture, test evaluation, report and presentation activities at a basic level. The candidate is required to select materials, tools and equipment correctly and safely in the manufacture and assembly of the artefact.

It is likely that this Unit will be delivered as part of the Intermediate 1 Engineering Skills Course. In this context candidate will build on the content covered in the three mandatory Units:

*Engineering Skills: Mechanical (Intermediate 1)*

*Engineering Skills: Electrical/Electronic (Intermediate 1)*

*Engineering Skills: Fabrication (Intermediate 1)*

This Unit provides candidates with the opportunity to integrate the skills developed in those Units.

It is 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 adhere to these at all times.

Candidates will work on a range of activities which will enable them to become familiar with a variety of dimensional and functionality tests. During the process of the artefact manufacture the candidate will use engineering terminology and will be able to demonstrate a basic knowledge and understanding of the terminology in everyday practice.

It would be beneficial if candidates were introduced to basic presentation and reporting techniques in order to plan, prepare and deliver a short report and presentation to their peers on the use and functionality of the artefact.

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

## National Unit Specification: support notes (cont)

### UNIT Engineering Skills: Manufacture and Assembly (Intermediate 1)

- ◆ following basic drawings and specifications
- ◆ checking own work
- ◆ identifying own strengths and weaknesses
- ◆ positive attitude to learning
- ◆ identifying learning points from practical experiences

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.

Candidates will develop written and/or oral communication skills when reporting on the functionality of the artefact.

Candidates will also have the opportunity to develop practical problem solving skills when working on the manufacture and assembly of an artefact.

The context for learning should include the requirement to be clean, presentable and appropriately dressed for the workshop, wearing personal protective equipment (PPE) including protective clothing when required.

Relevant aspects of current health and safety legislation, current Control of Substances Hazardous to Health (COSHH) Regulations and any systems of work relevant to the candidates' workshop/workplace should be explained and adhered to as part of the work of this Unit.

### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

It is important that there is an induction to the Unit that will include employability skills and health and safety awareness. This Unit involves experiential learning through the various practical experiences and presentation activities in the manufacture, assembly and testing of an artefact. Candidates should experience workshop conditions and should be encouraged to perform tasks and conduct themselves in a manner appropriate to the workplace.

General vocational skills, such as selecting and maintaining manufacturing and test tools and equipment, are integrated within the Unit. As well as carrying out practical tasks, candidates will also learn from brief lessons on health and safety and workshop protocol. Teaching and learning approaches will also include demonstrations of artefact functionality and usage tests by tutors. Short lessons on specific aspects of industrial practice and the correct use of tools and equipment will prove invaluable at intervals throughout the learning experience. These may be followed by brief practical sessions in which the candidates practise the testing skills emphasised by demonstrations.

Teaching and learning on reporting and presentation skills such as recording of relevant test data, valid conclusions derived from test data, selection and use of the appropriate presentation techniques, planning and preparation of a simple presentation and use of basic presentation equipment, if appropriate, will also be experienced.

## **National Unit Specification: support notes (cont)**

### **UNIT    Engineering Skills: Manufacture and Assembly (Intermediate 1)**

Integrated into the Unit are the employability skills that employers value. It should be stressed that all the employability skills are developed in this Unit but only specified employability skills will be assessed. Employability skills are a focus of this Unit and should be promoted from Unit induction to Unit completion.

In order to raise the candidate's awareness of local industries and the realities of the workplace, visits to local engineering firms could be arranged if appropriate. Equally, visiting speakers from local engineering firms should be encouraged. Additional useful material and employment opportunities can be resourced by researching local engineering firms or from the Internet.

#### **GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT**

The Unit assessment will include the manufacture and assembly of an artefact, test evaluation of the artefact, a report and presentation on the functionality of the artefact and a candidate review of employability skills. The manufacture, assembly, test, report, presentation of an artefact and the employability skills are assessed throughout the Unit.

The practical skills assessed in this Unit are:

- ◆ mechanical
- ◆ electrical/electronic
- ◆ fabrication
- ◆ assembly

The assessment of the manufacture and assembly skills will be evidenced by a practical assignment supported by assessor observation checklists on the practical activities.

It is anticipated that candidates will be given practice in manufacture and assembly techniques prior to assessment. The assessment activities should also make an important contribution to the learning process.

The test evaluation skills assessed in this Unit are:

- ◆ dimensional
- ◆ functional

The assessment of the test evaluation will be evidenced by a practical exercise(s) supported by assessor observation checklists.

It is recommended that a pro forma is used for the evaluation of test results. Candidates should use the data to prepare and present a short report to a peer group. The report should be between 150 and 400 words.

## National Unit Specification: support notes (cont)

### UNIT Engineering Skills: Manufacture and Assembly (Intermediate 1)

The Employability skills assessed in this Unit are:

- ◆ following instructions
- ◆ seeking advice
- ◆ working co-operatively with others
- ◆ showing health and safety awareness
- ◆ 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

The assessment of employability skills will be evidenced by a candidate review sheet supported with assessor observation checklists of the practical activities. It is recommended that the candidate review sheet should be completed towards the end of the Unit when the candidate and assessor will have had a reasonable time to make a judgement.

The assessment of the manufacture and assembly skills will be evidenced by a practical assignment involving the manufacture and assembly of an artefact. A typical example would be a CD holder with a LED circuit, and this will be supported by assessor observation checklists.

If candidates are working as a team on practical assignments, assessors must satisfy themselves that candidates are competent in each aspect of the given task.

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.

### **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](http://www.sqa.org.uk)).