

National Unit Specification: general information

UNIT	Machining and Finishing – Wood (Intermediate 1)
NUMBER	D184 10
COURSE	Woodworking Skills (Intermediate 1)

SUMMARY

Applying practical skills and adopting safe working practices in the use of common machine and power tools for the manufacture of a finished machined product.

OUTCOMES

- 1 Use common machine tools.
- 2 Use common power tools.
- 3 Use finishing techniques on timber products.
- 4 With the aid of machine and power tools, manufacture a product from a working drawing.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have had some previous experience in Craft Skills.

CREDIT VALUE

1 credit at Intermediate 1.

Administrative Information

Superclass:	WK
Publication date:	May 2006
Source:	Scottish Qualifications Authority
Version:	04

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National Unit Specification: general information (cont)

UNIT Machining and Finishing – Wood (Intermediate 1)

CORE SKILLS

This unit gives automatic certification of the following:

Complete core skills for the unit

None

Core skills components for the unit

Planning and Organising Int 1

Additional information about core skills is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999).

National Unit Specification: statement of standards

UNIT Machining and Finishing – Wood (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

Use common machine tools.

Performance criteria

- (a) Instruction on the preparation for use of fixed machinery is interpreted and implemented correctly.
- (b) Machining operations are carried out to specified tolerances in the correct sequence.
- (c) Work methods and activities are in accordance with recognised safety requirements.

Note on range for the outcome

Machine tools/operators: vertical drill, woodworking lathe (between centres), belt or disc sander.

Evidence requirements

Evidence of the candidate using machine tools in an appropriate manner.

Observational evidence of adherence to safe working practices related to the tasks being undertaken.

OUTCOME 2

Use common power tools.

Performance criteria

- (a) Instruction on the preparation for use of portable power tools is interpreted and implemented correctly.
- (b) Power-tool operations are carried out to specified tolerances in the correct sequence.
- (c) Work methods and activities are in accordance with recognised safety procedures.

Note on range for the outcome

Power tools: portable hand drills, sanders, power screwdrivers.

Evidence requirements

Evidence of the candidate using power tools in an appropriate manner.

Observational evidence of adherence to safe working practices related to the tasks being undertaken.

National Unit Specification: statement of standards (cont)

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OUTCOME 3

Use finishing techniques on timber products.

Performance criteria

- (a) The preparation of surfaces is in accordance with the instructions given.
- (b) The preparation of finishing materials prior to application is in accordance with manufacturers' instructions.
- (c) The application of finishes is in accordance with instructions given.
- (d) Work methods and activities are in accordance with recognised safety procedures.

Note on range for the outcome

Surface preparations: planing, sanding, stopping and filling

Surface finishes: varnishing, undercoat and oil-paint finishes, application of wax finish when appropriate.

Evidence requirements

Inspection of an artefact, manufactured from timber-based materials, which has been prepared and finished. The finish will be free from gross blemishes and will have been achieved by using a minimum of two coats of brush-applied finishing materials.

Performance evidence of the candidate carrying out the above task, using good working practice, to include appropriate ventilation, protective clothing and brush cleaning.

Observational evidence of adherence to safe working practices related to the tasks being undertaken.

National Unit Specification: statement of standards (cont)

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OUTCOME 4

With the aid of machine and power tools, manufacture a product from a working drawing.

Performance criteria

- (a) Correct terminology is employed with regard to the tools and processes being used.
- (b) The product is marked out prior to machining in accordance with the working drawing.
- (c) The product is manufactured within specified tolerances, following a given sequence of operations.
- (d) Work methods and activities are in accordance with recognised safety procedures.

Note on range for the outcome

Manufactured product: an artefact of four or more components, made from timber-based products.

Evidence requirements

Written and/or oral evidence on methodology and terminology related to power tools.

Performance evidence that the candidate can manufacture and finish a product of two or more components that involves the use of the woodworking lathe, plus one other machine tool and two power tools from the following lists:

- 1 Machine tools: woodworking lathe (between centres), pedestal drill, belt and disc sander.
- 2 Power tools: portable hand drills, sanders, power screwdrivers.

Appropriate preparation and finishing techniques as described for Outcome 3.

Observational evidence of adherence to safe working practices related to the tasks being undertaken.

National Unit Specification: support notes

UNIT Machining and Finishing – Wood (Intermediate 1)

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

This unit provides candidates with the opportunity to acquire knowledge and understanding of the parts, setting up and appropriate uses of a range of fixed and portable machine tools. They will also be expected to adhere to important safety procedures associated with the use of fixed and hand-held machine tools, and conduct themselves in a manner suitable to an industrial area.

Candidates should be encouraged to be independent, and to make choices in the use of the machine and power tools to be used.

GUIDANCE ON CONTENT AND CONTEXT FOR THE UNIT

This unit balances practical activity with knowledge and understanding that can be transferred to more complex machinery in industrial situations at a later date.

Through this practical activity, the candidate should develop respect for codes of practice and develop a healthy attitude to safety regulations.

The candidate should develop skills in:

- using a variety of fixed and portable machine tools to manufacture a product
- preparing and finishing a timber product
- recognising the need for, and adhering to, safe working practices at all times

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

The major part of the teaching and learning in this unit is aimed at ensuring that systematic approaches and routine checks become an integral part of the candidates' approach to practical work.

Using a variety of fixed and portable machine tools to manufacture a product

Candidates will learn the setting up and use of a small range of fixed and portable machine tools, paying due regard to safety procedures. They will also be able to select the correct machine tool from the range studied, to carry out a range of basic operations.

Candidates should become aware of the need for the sequencing of work, both in machining operations and preparation and finishing of materials.

Routine checks should be evident at all times, and systematic good working practice should be the norm rather than the exception.

National Unit Specification: support notes (cont)

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Preparing and finishing a timber product

Candidates should develop a clear understanding of water oil and spirit-based finishes available and the appropriate brush-cleaning methods for each type of finish.

Candidates will also learn the various stages in the preparation of surface finishes for wood, and the preparation and application of a limited range of basic surface finishes.

Recognising the need for, and adhering to, safe working practices at all times

Conforming to rules and regulations begins in the induction period, and should permeate the whole of this course. Receptive attitudes to systematic approaches developed while using bench skills will make adherence to safe working practices in this unit more achievable.

Each new activity should be presented with a code of practice, which should be firmly enforced.

Developing receptive attitudes to systematic approaches for good working practice can sometimes be an uphill struggle, and teachers and lecturers must be unstinting in their pursuit of achieving this goal.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Whenever possible, the dynamic nature of this course should not be hindered by overburdening assessment of the candidate.

The candidate should be aware that certain performances (including safe working practice) are being monitored constantly and recorded on an observation checklist. In addition, finished artefacts will be tested against the stated criteria for accuracy and quality. Lengthy written tests are not required for tool, process or equipment recognition and use. A preferred technique would be to display the tools and equipment and ask the candidates to write or state their names and uses.

Observational checklists will be required to monitor routine inspections prior to use of both fixed and machine tools. The candidates should be observed to check for common errors in the setting up of fixed and machine tools, prior to use on a regular basis.

The candidate will produce an artefact for Outcome 4, which should provide performance evidence as it is required for the unit.

National Unit Specification: support notes (cont)

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An example of this might be as follows:

<i>Fixed machine tools</i>	
OPERATION	TOLERANCES
Turn between centres to a given diameter	±2 mm*
Drill to a given hole position using Pillar Drill	±2 mm*
Drill to a given hole depth using Pillar Drill	±2 mm*
Finish to a line using the Disc sander	±2 mm*
<i>Portable power tools</i>	
OPERATION	TOLERANCES
Drill to a given hole position using portable hand drill	±2 mm*
Portable machine sanding	free from gross sanding damage
Screwdriving	limited damage or unsatisfactory torque

* These tolerances would depend upon the size and scale of the work.

Assessment of knowledge and understanding with regard to terminology and safety requirements should be carried out at appropriate stages either to a whole group or to individual candidates at the same stage.

Approaches to generating evidence

Assessment evidence for this unit should be able to be drawn from the manufacture of artefacts. In situations where candidates fail to achieve the required standard of performance in one area, this weakness can be targeted in another part of the course, when the next artefact is manufactured.

In situations where candidates fail to achieve the required standard of performance in more than one area, it may be necessary to provide tasks aimed specifically at the areas to be reassessed.

Some candidates may require additional support and help to ensure success in the manufactured product. However, they must also be aware that the overall course assessment takes into account the amount of practical assistance given by the teacher/lecturer and that ultimately a degree of independence is expected from the candidate.

A practical approach is recommended, and candidates will produce a range of work, which should be retained for assessment and external sampling. The culmination of the unit is the manufactured product, and generally the best work should be considered for assessment.

National Unit Specification: support notes (cont)

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Generally, some evidence of machine and surface finishing work can be incorporated into either a flat-frame or a carcase construction undertaken in another part of the course. This is to aid relevance and to encourage motivation. It is proposed that evidence for Outcomes 3 and 4 would be best developed through an artefact requiring machining and finishing skills. An example of this could be a small winetable incorporating wood turning and surface preparation and finishing.

SPECIAL NEEDS

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).