



Higher National Unit specification

General information for centres

Unit title: Jewellery: Advanced Gemmology

Unit code: F3X4 35

Unit purpose: This Unit is designed to enable candidates to study and test a range of synthetic and rare gemstones and gemstone colour and clarity enhancement. On completion of the Unit the candidate should be able to:

- 1 Evaluate the use of specialised laboratory testing techniques.
- 2 Explain gemstone enhancement techniques.
- 3 Use sources to describe rare and synthetic gem materials.
- 4 Use gemmological equipment to analyse lesser known gem materials.

Credit points and level: 1 HN credit at SCQF level 8: (8 SCQF credit points at SCQF level 8*)

**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.*

Recommended prior knowledge and skills: Access is at the discretion of the centre. However, it would be difficult for a candidate to complete this Unit without practical experience of gemmology, which could be evidenced by the successful completion of HN Unit *Jewellery: Practical Gemmology*. It is highly recommended that candidates complete the *Practical Gemmology* Unit before undertaking *Jewellery: Advanced Gemmology*.

Core Skills: There are opportunities to develop the Core Skills of *Problem Solving* at SCQF level 6 and the component Using Number of the Core Skill of *Numeracy* at SCQF level 5 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

Context for delivery: If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Assessment: Outcomes, 1, 2 and 3 could be assessed by reports based on candidate research. Outcome 4 will be in the form of a supervised practical assessment under closed-book conditions.

Higher National Unit specification: statement of standards

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The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Evaluate the use of specialised laboratory testing techniques

Knowledge and/or Skills

- ◆ Ultra violet spectroscopy
- ◆ Infra red spectroscopy
- ◆ X-ray diffraction
- ◆ Electron microscope
- ◆ Study of inclusions

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ evaluate the use of the following specialised laboratory techniques: ultra violet spectroscopy, infra red spectroscopy, x-ray diffraction, electron microscope. Candidates must describe each technique; discuss the circumstances when each would be used; and the type of data generated by each technique. Candidates must include examples of specific gem materials in their evidence.
- ◆ explain the study of inclusions and what information this would give about the appearance, origin and occurrence of specific gem materials.

Assessment Guidelines

This Outcome could be assessed by a report based on candidate research into each of these techniques.

Higher National Unit specification: statement of standards (cont)

Unit title: Jewellery: Advanced Gemmology

Outcome 2

Explain gemstone enhancement techniques

Knowledge and/or Skills

- ◆ Colour
- ◆ Clarity
- ◆ Heat treatment
- ◆ Surface diffusion
- ◆ Irradiation
- ◆ Lasering
- ◆ Fracture filling

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ explain the following techniques in relation to enhancing the colour of gem materials: heat treatment, surface diffusion and irradiation. The explanation must include a broad outline of each technique, details of the specific gem materials to which each can be applied and the conditions which would be expected to produce certain effects.
- ◆ explain the following techniques in relation to enhancing the clarity of gem materials: lasering and fracture filling. The explanation must include a broad outline of each technique, details of the specific gem materials to which each can be applied and the conditions which would be expected to produce certain effects.

Assessment Guidelines

This Outcome could be assessed by a report based on candidate research into each of these techniques.

Higher National Unit specification: statement of standards (cont)

Unit title: Jewellery: Advanced Gemmology

Outcome 3

Use sources to describe rare and synthetic gem materials

Knowledge and/or Skills

- ◆ Natural gem materials
- ◆ Synthetic gem materials
- ◆ Physical properties
- ◆ Optical properties
- ◆ Occurrence
- ◆ Identification features

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can use one or more information sources to provide the basis of descriptions of the following:

- ◆ natural gem materials: Andalusite; Apatite; Calcite; Diopside; Feldspar; Fluorite; Haematite; Iolite; Lapis; Malachite; Pyrite; Rhodochrosite; Rhodonite; Sodalite; Spodumene; Zoisite
- ◆ synthetic Gemstones: Corundum; Emerald; CZ; Spinel; Opal

Each description must include the physical properties, optical properties, occurrence and identification feature.

Assessment Guidelines

This Outcome could be assessed by a report based on candidate research into each of the gem materials. It is recommended that each description is brief.

Higher National Unit specification: statement of standards (cont)

Unit title: Jewellery: Advanced Gemmology

Outcome 4

Use gemmological equipment to analyse lesser known gem materials

Knowledge and/or Skills

- ◆ Gem testing equipment
- ◆ Test data
- ◆ Analysis
- ◆ Difficult gem materials

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ analyse 12 lesser known gem materials through the selection and use of the appropriate gemmological equipment from the following: polariscope, refractometer, microscope, spectroscope, dichroscope, Chelsea filter. Candidates must record their test data which will form the basis of their conclusion with regard to the identity of the gem material.

This assessment will be conducted under supervised conditions. Candidates will be given 12 difficult gem materials, which they will have to analyse. Candidates must correctly identify 10 out of 12 materials under test.

The size, shape and setting of the gem materials must be sufficient to reflect what might be encountered in the jewellery industry.

Assessment Guidelines

It is recommended that a three hour period is allocated to test a maximum of 12 gemstones. Sufficient gem testing equipment should be available to allow each candidate adequate access time to carry out testing of samples.

Administrative Information

Unit code: F3X4 35

Unit title: Jewellery: Advanced Gemmology

Superclass category: JH

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Higher National Unit specification: support notes

Unit title: Jewellery: Advanced Gemmology

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 has been designed to allow candidates to study a range of less common topics related to the science of gemmology, specifically:

- ◆ specialist laboratory testing techniques
- ◆ gem enhancement techniques
- ◆ rare gemstones
- ◆ synthetic gemstones

In addition, the candidates will be required to test a range of rarer and more difficult gemstones in the form of a practical assessment.

Guidance on the delivery and assessment of this Unit

It is anticipated that the lecturer will provide a range of short lectures during the early stages of delivery of this Unit, providing an outline of its requirements. Candidates will then have a period of time to research and produce a report on the relevant topic.

In addition, laboratory practice will be used to allow the candidate to build up a range of competences in the gem testing process and allow them to apply this knowledge in a practical environment.

Opportunities for developing Core Skills

In undertaking this Unit, candidates may have the opportunity to develop the following:

Problem Solving at SCQF level 6 — candidates will be required to ascertain various measurements from a range of gemstones and using only this information, and with limited reference material, come up with a single identification of a given gemstone. Practical limitations in natural materials and the equipment may provide a variety of problems, which candidates will have to overcome.

The component *Using Number* of the Core Skill of *Numeracy* at SCQF level 5 — candidates will be required to weigh and accurately measure gemstones in order to calculate constants such as Specific Gravity and Birefringence.

Open learning

This Unit could be delivered by distance learning. However, it would require planning by the centre to ensure the sufficiency and authenticity of candidate evidence.

Higher National Unit specification: support notes (cont)

Unit title: Jewellery: Advanced Gemmology

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).

General Information for Candidates

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Whilst this Unit may be taken as a stand alone Unit it is highly recommended that you should have first successfully completed the *Practical Gemmology* Unit.

This Unit has been written in order to allow you to study a range of less common topics related to the science of gemmology and as such you will study the theoretical aspect of the following particular areas:

- ◆ specialist laboratory testing techniques
- ◆ gem enhancement techniques
- ◆ rare gemstones
- ◆ synthetic gemstones

The Unit will provide you with an understanding of specialist laboratory testing techniques used and the science of gemmology. Assessment for the first three Outcomes of this Unit is likely to be in the form of reports based on your research into the given tasks. In addition you will be required to conduct tests to identify a number of lesser known common gemstones and this assessment will take the form of a practical assessment under supervised conditions.

In undertaking this Unit, candidates may have the opportunity to develop the Core Skill of *Problem Solving* at SCQF level 6 and the component Using Number of the Core Skill of *Numeracy* at SCQF level 5, although there is no automatic certification of Core Skills in this Unit.