National 5 Unit Specification

Engineering Contexts and Challenges with a Scottish Context (National 5)

SCQF: level 5 (6 SCQF credit points)

Unit code: H6NT 75

Unit outline

The general aim of this Unit is to develop a basic understanding of engineering, and its role and impact on our society and environment with a Scottish context. Learners will investigate engineering systems, problems and solutions, involving some existing and emerging technologies, and consider implications relating to the environment, sustainable development, and to economic and social issues within Scotland.

Learners who complete this Unit will be able to:

1 Investigate engineered objects
2 Investigate engineering challenges and relate these to key engineering concepts
3 Describe some aspects of the impact of engineering

This Unit is an alternative mandatory Unit of the Engineering Science (National 5) Course, an Optional Unit in the Scottish Studies Award at SCQF level 5 and is also available as a free-standing Unit. The Unit Specification should be read in conjunction with the *Unit Support Notes*, which provides advice and guidance on delivery, assessment approaches and development of skills for learning, skills for life and skills for work.
The *Course Assessment Specification* for the Engineering Science (National 5) Course gives further mandatory information on Course coverage for learners taking this Unit as part of the Engineering Science (National 5) Course.

Recommended entry

Entry to this Unit is at the discretion of the centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

- Numeracy (SCQF level 4)
- Engineering Contexts and Challenges (National 4)

Equality and inclusion

This Unit Specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence. For further information, please refer to the *Unit Support Notes*.

Standards

Outcomes and assessment standards

Outcome 1

The learner will:

1 Investigate engineered objects by:

1.1 Describing, using the systems approach, how some engineered objects work
1.2 Identifying sub-systems and describing the function of each and how they interact
1.3 Producing system diagrams to show sub-systems
1.4 Carrying out energy audits

Outcome 2

The learner will:

2 Investigate engineering challenges and relate these to key engineering concepts by:

2.1 Identifying and describing how several different branches of engineering contribute to solving an engineering challenge
2.2 Describing examples of the varied roles of engineers in designing, implementing, testing and controlling complex systems
2.3 Modelling some aspect (related to one branch of engineering) of a solution to an engineering challenge
2.4 Explaining how emerging technologies may provide improved solutions to engineering challenges

Outcome 3

The learner will:

3 Describe some aspects of the impact of engineering by:

3.1 Describing examples of social and economic impacts of engineering
3.2 Describing some examples of environmental impacts of engineering
3.3 Describing some ways in which engineering solutions contribute to tackling climate change

Evidence Requirements for the Unit

Assessors should use their professional judgement, subject knowledge and experience, and understanding of their learners, to determine the most appropriate ways to generate evidence and the conditions and contexts in which they are used.

For this Unit, learners will be required to demonstrate technological skills, knowledge and understanding in a range of engineering contexts and challenges.

Candidates will carry out an investigation of specific engineering challenges in Scotland. The study of some aspects of the benefits of engineering in specific Scottish contexts.

Evidence of Outcomes may take many forms, including oral or written evidence, or may be demonstrated by carrying out practical tasks. Evidence of Outcomes and Assessment Standards may be generated during one or more activities.

Development of skills for learning, skills for life and skills for work

It is expected that learners will develop broad, generic skills through this Unit. The skills that learners will be expected to improve on and develop through the Unit are based on SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work* and drawn from the main skills areas listed below. These must be built into the Unit where there are appropriate opportunities.

2 Numeracy

2.3 Information handling

4 Employability, enterprise and citizenship

4.2 Information and communication technology (ICT)

5 Thinking skills

5.2 Understanding
5.3 Applying

Amplification of these is given in SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work.* The level of these skills should be at the same SCQF level of the Unit and be consistent with the SCQF level descriptor. Further information on building in skills for learning, skills for life and skills for work is given in the *Unit Support Notes.*

Administrative information

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Superclass: XA

History of changes to National Unit Specification

Version	Description of change	Authorised by	Date