

Route map through assessment

Course: Engineering Science

Level: National 5

This document is intended to assist staff in planning and delivering the overall vision for Curriculum for Excellence.

The vision for the new national qualifications is to create assessment opportunities that follow and support learning and teaching. This follows the principles laid out in *Building the Curriculum 5* and makes assessment a natural part of learning and teaching.

This route map aims to signpost all of the relevant material that is available to support your subject. Your professional judgement is vital and the documents listed below are intended to support you in deciding the most appropriate ways to generate evidence and assess learners.

Education Scotland has produced a professional focus paper for engineering science, and this is a good starting point as it provides support to help develop learning and teaching approaches that take forward the purposes and principles of Curriculum for Excellence through Engineering Science National 5.

http://www.educationscotland.gov.uk/nqcoursematerials/subjects/e/nqresource_tcm4748170.asp

Engineering Science National 5 course content

This is a new course, replacing Technological Studies. Previous skills, knowledge and understanding will continue to be integrated but the unit titles are different: designing, developing, simulating, building and testing, investigating, electrical, mechanical, civil and chemical engineering, electronics and microcontroller-based control systems and their application, knowledge of mechanical, structural and pneumatics systems and their application, relevance of energy, efficiency and sustainability.

The main SQA engineering science page is found at <http://www.sqa.org.uk/sqa/45648.html>, with pages specifically relating to National 5 at <http://www.sqa.org.uk/sqa/47458.html>. Staff should also regularly check the updates and announcements section of this page.

The course specification can be found at http://www.sqa.org.uk/files_ccc/CfE_CourseSpec_N5_Technologies_EngineeringScience.pdf.

There are three units: Engineering Contexts and Challenges, Electronics and Control and Mechanisms and Structures.

New skills, knowledge and understanding of different branches of engineering, emerging technologies, roles of engineers in designing, implementing, testing and controlling systems, social and economic benefits of engineering, environmental benefits, engineering solutions to tackling climate change have been introduced for this level.



Engineering Contexts and Challenges: Introduces engineering concepts by exploring a range of engineered objects, and straightforward engineering problems and solutions. Allows learners to explore some existing and emerging technologies and challenges, and to consider implications relating to the environment, sustainable development, and economic and social issues.

Electronics and Control: Focuses on key concepts and devices used in analogue and digital electronic control systems.

Mechanisms and Structures: Focuses on developing a understanding of simple mechanisms and structures.

To gain an award at National 5 learners must complete all three units as well as the course assessment.

Course assessment

The assignment and question paper will address one or more of breadth, challenge and application. Course assessment will provide the basis for grading attainment in the course award. The course assessment is graded A–D. The grade is determined on the basis of the total mark for all course assessments together.

Assignment

The assignment (worth 40% of overall grade) requires learners to demonstrate challenge and application. The purpose of the assignment is to assess practical application of knowledge and skills from the units to develop a solution to an appropriately challenging engineering problem.

Question paper

The question paper (worth 60% of overall grade) requires learners to demonstrate breadth. The purpose of the question paper is to assess breadth of knowledge from across the units, depth of understanding, and application of this knowledge and understanding to answer appropriately challenging questions.

The question paper has two sections:

Section 1 has 20 marks and consists of short answer questions.

Section 2 has 70 marks and consists of extended response questions.

Verification

The verification process is meant to be supportive and not onerous.

Internal verification is the process of ensuring standards are applied uniformly and consistently within a school in line with national standards. External verification is the process of ensuring that national standards are maintained consistently across all schools.

Quality assurance: <http://www.sqa.org.uk/sqa/58448.html>.

Prior verification

http://www.sqa.org.uk/files_ccc/Prior%20Verification%20Centre%20Guidance%20FINAL.pdf

Staff who devise their own assessments can send them to SQA for prior verification, free of charge. This is only necessary where significant changes have been made to the unit assessment provided. It gives departments confidence that their proposed assessment is fit for purpose and meets national standards.



Internal verification

http://www.sqa.org.uk/sqa/files_ccc/InternalVerificationGuideforSQAcentres.pdf

As a matter of course staff should be quality assuring their assessments by carrying out activities that they have always done for NABs, for example double marking and blind marking. A sample of learners' work should be marked by more than one staff member in a department, and in single-person departments an arrangement should be made with another local authority school.

External verification

In engineering science schools will submit a sample of learners' evidence for scrutiny by subject-specialist qualification verifiers. SQA intend that every school will be verified over the first few years. Verification will take place in November, February and May. Twelve samples will be asked for.

http://www.sqa.org.uk/sqa/files_ccc/Evidence_required_for_verificationevents.pdf

Schools must retain the evidence until 31 July.

http://www.sqa.org.uk/sqa/files_ccc/SQA_Evidence_retention_requirements_A3_table.pdf

Key messages from verification will be put up on the SQA website.

Recognising positive achievement

http://www.sqa.org.uk/files_ccc/Recognising_Positive_Achievement_N4N5.pdf

This is only applicable to National 5, **not** Higher. A learner who achieves 'No Award' in a National 5 course assessment will be able to gain a National 4 course award as long as he/she has passed all the internally assessed units of the National 5 course **and** has passed the National 4 Added Value Unit.

Results services

http://www.sqa.org.uk/sqa/files_ccc/FA6669_SQA_Results_Services_A5_8pp_brochure_web.pdf

<http://www.sqa.org.uk/sqa/65427.html>

There are no longer any appeals. SQA offers two services: (1) Exceptional Circumstances Consideration Services (within ten days of sitting external assessment) and (2) Post Results Service. The latter consists of either a clerical check or a marking review. It is likely that these will be carried out in conjunction with the school SQA co-ordinator.

Education Scotland support materials

Advice and support for new national qualifications (Glow password required):

[Engineering Science – Advice and guidance](#)

[Skills in Practice](#)

Other useful websites

A quick guide to finding vital information about Curriculum for Excellence:

<http://www.educationscotland.gov.uk/keycfesupport/index.asp>

This appears under three headings

- the latest guidance, updates and plans for embedding Curriculum for Excellence
- information on assessment
- information on the new qualifications.

The BBC has pulled together all its learning content in a new Knowledge and Learning Beta site that includes Class Clips:

www.bbc.co.uk/education