



Mechanisms and Structures (National 5) Unit

SCQF: level 5 (6 SCQF credit points)

Unit code: H23D 75

Unit outline

The general aim of this Unit is to develop an understanding of mechanisms and structures. Learners will explore a range of mechanical and pneumatic systems and design, simulate, construct, test and evaluate mechanical or pneumatic solutions to solve problems.

Learners who complete this Unit will be able to:

- 1 Investigate a range of mechanical and pneumatic systems
- 2 Develop mechanical or pneumatic solutions to solve problems

This Unit is a mandatory Unit of the Engineering Science (National 5) Course 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. Exemplification of the standards in this Unit is given in the *Unit Assessment Support*.

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)
- ◆ Mechanisms and Structures (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 a range of mechanical and pneumatic systems by:**
 - 1.1 Describing or producing diagrams of a range of structures
 - 1.2 Describing or producing diagrams of a range of pneumatic systems
 - 1.3 Describing or producing diagrams of a range of mechanical drive systems
 - 1.4 Carrying out calculations involving energy, work, power and efficiency using given formulae

Outcome 2

The learner will:

- 2 Develop mechanical or pneumatic solutions to solve problems by:**
 - 2.1 Identifying key aspects of a problem
 - 2.2 Applying knowledge and understanding of structures, pneumatics and/or mechanical drive systems
 - 2.3 Designing, and simulating or building, mechanical or pneumatic systems
 - 2.4 Testing and evaluating solutions against a specification

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 the context of mechanical and pneumatic systems.

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. Although learners are expected to develop a range of mechanical or pneumatic solutions for Outcome 2, evidence is only required for one.

Exemplification of assessment is provided in the *Unit Assessment Support*. Advice and guidance on possible approaches to assessment is provided in the *Unit Support Notes*.

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

- 2.1 Number processes
- 2.3 Information handling

4 Employability, enterprise and citizenship

- 4.2 Information and communication technology (ICT)

5 Thinking skills

- 5.3 Applying
- 5.4 Analysing and evaluating

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

Published: June 2013 (version 1.1)

Superclass: XH

History of changes to National Unit Specification

Version	Description of change	Authorised by	Date
1.1	Change of wording in Assessment Standards 1.1, 1.2, 1.3 'Drawing' changed to 'Producing'	Qualifications Development Manager	June 2013

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Note: readers are advised to check SQA's website: www.sqa.org.uk to ensure they are using the most up-to-date version of the Unit Specification.

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