

# Draft National Unit Specification



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**Unit title:** Mechanical Systems (National 5)

**SCQF:** level 5 (6 SCQF credit points)

**Unit code:** to be advised

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## Unit outline

The general aim of this Unit is to develop an understanding of mechanical systems. Learners will analyse and explore mechanical engineering systems and design, simulate, construct, test and evaluate solutions.

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 *National Assessment Resource*.

## 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)
- ◆ Mechanical Systems (National 4)

In terms of prior learning and experience, relevant experiences and outcomes may also provide an appropriate basis for doing this Unit. Further information on relevant experiences and outcomes will be given in the *Unit Support Notes*.

## 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 Analysing systems using the systems approach
- 1.2 Describing or drawing diagrams of a range of structures
- 1.3 Describing or drawing diagrams of a range of pneumatic systems
- 1.4 Describing or drawing diagrams of a range of mechanical drive systems
- 1.5 Identifying energy transformations involving kinetic, potential, heat and electrical energy
- 1.6 Carrying out calculations using given formulae

### Outcome 2

The learner will:

#### 2 Develop mechanical or pneumatic solutions to solve problems by:

- 2.1 Identifying key aspects of the problem
- 2.2 Applying knowledge and understanding of structures, pneumatics and mechanical drive systems
- 2.3 Designing structures and drive systems
- 2.4 Simulating or building mechanical or pneumatic systems
- 2.5 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 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.

Exemplification of assessment will be provided in the *National Assessment Resource*. 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



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**Published:** August 2011 (draft version 1.0)

**Superclass:** to be advised

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### History of changes

Version	Description of change	Authorised by	Date

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