

<b>Title</b>	<b>Demonstrate and apply knowledge of setting and operating CNC engineering machines</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>4</b>

<b>Purpose</b>	<p>This unit standard covers principles and practical application of Computer Numerical Control (CNC) machine setting and operation.</p> <p>People credited with this unit standard are able to demonstrate knowledge of CNC machines, and set and operate CNC machines.</p>
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<b>Classification</b>	Mechanical Engineering > Engineering Machining and Toolmaking
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<b>Available grade</b>	Achieved
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<b>Entry information</b>	
<b>Recommended skills and knowledge</b>	Candidates must be able to safely carry out basic machining operations. This could be evidenced by credit for standards such as Unit 21906, <i>Perform basic mechanical engineering machining operations under supervision</i> .

**Explanatory notes**

- 1 References  
 Health and Safety in Employment Act 1992;  
 Occupational Safety & Health Service. *Guidelines for Guarding Principles and General Safety for Machinery*. Wellington: Department of Labour, 1995.
  
- 2 Definitions  
 CAD – Computer Aided Design.  
 CAM – Computer Aided Manufacturing.  
 CNC – Computer Numerical Control.  
 DNC – Distributive Numerical Control.  
*Safe working practices* – work practices designed to prevent personal injuries and damage to equipment and plant. This includes practices relating to personal attire and use of safety clothing and equipment, use of machinery and tools, and handling of materials and waste.

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## Outcomes and evidence requirements

### Outcome 1

Demonstrate knowledge of CNC machines.

#### Evidence requirements

- 1.1 The purpose and advantages of CNC are outlined, compared to manually controlled machining.
- 1.2 The major components and accessories of CNC machines are identified and their functions outlined.
- Range CNC lathe, CNC mill.
- 1.3 Typical programmable functions are identified.
- 1.4 Machine tool and workpiece movements are expressed in terms of Cartesian coordinates, and the purpose of the reference point (grid zero) is explained.
- Range CNC lathe, CNC mill.
- 1.5 The purpose of tool compensation is explained.
- 1.6 The interaction between CAD, CAM, and DNC in relation to modern production of components using CNC is outlined.
- 1.7 Hazards in the use of CNC machines, and methods of managing these hazards, are identified.

### Outcome 2

Set CNC machines.

Range CNC lathe, CNC mill.

#### Evidence requirements

- 2.1 Cutting tools are loaded into turret in accordance with specifications.
- 2.2 Holding devices, safe and suitable for the task, are selected, and workpiece is loaded in accordance with machine instructions.
- 2.3 Program is loaded in accordance with machine instructions.
- 2.4 Reference point is assigned in accordance with machine instructions.
- 2.5 Offsets are entered in accordance with machine instructions and specifications.

**Outcome 3**

Operate CNC machines.

Range CNC lathe, CNC mill.

**Evidence requirements**

- 3.1 Test pieces are cut in accordance with machine instructions.
- 3.2 Measurements and adjustments are made until the machine cuts components to specifications.
- 3.3 Machine operation is monitored and tool changes made as required.
- 3.4 Machining is performed in accordance with safe working practices.

<b>Replacement information</b>	This unit standard was replaced by unit standard 30276.
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**This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.**

**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	20 June 2006	31 December 2022
Rollover and Revision	2	17 November 2011	31 December 2022
Review	3	20 July 2017	31 December 2022

<b>Consent and Moderation Requirements (CMR) reference</b>	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

**Please note**

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The

CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

**This unit standard is expiring**