

<b>Title</b>	<b>Demonstrate and apply knowledge of mechanical statics</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>15</b>

<b>Purpose</b>	People credited with this unit standard are able to: describe and illustrate concepts in mechanical statics; apply mechanical statics principles to workplace applications; and apply stress and strain principles to steel components.
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<b>Classification</b>	Mechanical Engineering > Applied Principles of Mechanical Engineering
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<b>Available grade</b>	Achieved
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### Explanatory notes

- 1 References  
Health and Safety at Work Act 2015 and supporting Regulations.
- 2 Definitions  
*Accepted industry practice* refers to approved codes of practice and standardised procedures accepted by the wider mechanical engineering industry sectors as examples of best practice.  
*Workplace procedures* refer to procedures used by the organisation carrying out the work and applicable to the tasks being carried out. They may include but are not limited to – standard operating procedures, safety procedures, equipment operating procedures, codes of practice, quality management practices and standards, procedures to comply with legislative and local body requirements.
- 3 Assessment information  
Numerous reference texts and training manuals on mechanical statics are available and may be used; however no one textbook or source of information is envisaged. All activities must comply with applicable workplace procedures and must be consistent with accepted industry practice.

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### Outcomes and evidence requirements

#### Outcome 1

Describe and illustrate concepts in mechanical statics.

Range concepts – statics, equilibrium, forces, vectors, stress, strain.

**Evidence requirements**

- 1.1 Concepts are described in terms of main features, purpose, and use.
- 1.2 Concepts are illustrated by actual practical examples from within the workplace.

**Outcome 2**

Apply mechanical statics principles to workplace applications.

**Evidence requirements**

- 2.1 The principles of forces, moments, and couples are applied to workplace applications.  
  
Range applications – coplanar force systems, loading of beams, frameworks, centres of gravity.

**Outcome 3**

Apply stress and strain principles to steel components.

**Evidence requirements**

- 3.1 Direct stress, indirect stress, and direct strain calculations are performed to determine the suitability of components for use.
- 3.2 Torsional stress and strain calculations are performed to determine the suitability of solid and hollow sections for use.
- 3.3 Calculated working stresses for steel components are compared for conformity with published allowable stresses for loading, fixing, and factors of safety.  
  
Range published allowable stresses – manufacturers’ and/or material suppliers’ data.
- 3.4 Second moments of area are calculated on the basis of determined working stress and/or allowable working stress.

<b>Replacement information</b>	This unit standard and unit standard 21774 replaced unit standard 11388 and unit standard 11389.
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<b>Planned review date</b>	31 December 2021
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**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	27 October 2005	31 December 2016
Rollover and Revision	2	19 March 2010	31 December 2021
Review	3	20 October 2016	N/A

**Consent and Moderation Requirements (CMR) reference**

0013

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 (CMRs). 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.

**Comments on this unit standard**

Please contact Competenz [qualifications@competenz.org.nz](mailto:qualifications@competenz.org.nz) if you wish to suggest changes to the content of this unit standard.