

National Certificate in Mechanical Engineering (Level 5) with strands in Engineering Fabrication, Fire Protection, General and Maintenance Engineering, Mechanical Services, and Precision Engineering

Level 5

Credits 78

This qualification has been **reviewed**. The last date to meet the requirements is 31 December 2020.

Transition Arrangements

This qualification was republished in October 2017 to extend the last date for enrolment from 31 December 2017 to 31 December 2018, and the last date of assessment from 31 December 2019 to 31 December 2020.

This qualification has been replaced by the New Zealand Certificate in Mechanical Engineering (Advanced) (Level 5) [Ref: 2716].

The last date for entry into programmes leading to this qualification is 31 December 2018. The last date for assessments to take place for this qualification is 31 December 2020, when the qualification will be discontinued.

People currently working towards this qualification may either complete the requirements by 31 December 2020 or transfer their results to the replacement qualification.

This qualification contains expired and expiring unit standards, for which replacement standards have now been registered. Candidates who have gained credit for the replacement unit standards are exempt from the requirement to gain credit for the expired or expiring unit standards.

Credit for	Exempt from
91408	7380
27446	20800
27520, 27521	25463
30265	17602

This qualification also contains expired and expiring unit standards, for which no replacement standards have been registered. Candidates who have gained credit for the recommended unit standards are exempt from the requirement to gain credit for the expired or expiring unit standards.

Credit for	Exempt from
27566	1988

Credit for	Exempt from
23397, 27558	8493

For detailed information see [Review Summaries](#) on the NZQA website.

NZQF Registration Information

Process	Version	Date	Last Date for Assessment
Registration	1	April 2010	December 2020
Review	2	July 2015	December 2020
Republication	2	May 2016	December 2020
Republication	2	October 2017	December 2020

Standard Setting Body

Competenz
PO Box 9005
Newmarket
Auckland 1149

Telephone 0800 526 1800
Email info@competenz.org.nz
Website www.competenz.org.nz

REVIEWED

National Certificate in Mechanical Engineering (Level 5) with strands in Engineering Fabrication, Fire Protection, General and Maintenance Engineering, Mechanical Services, and Precision Engineering

Level	5
Credits	78

Purpose

The National Certificate in Mechanical Engineering (Level 5) with strands in Engineering Fabrication, Fire Protection, General and Maintenance Engineering, Mechanical Services, and Precision Engineering is for qualified engineering tradespeople who wish to further develop their technical, business, and overall leadership knowledge and skills and gain a qualification at an advanced trade level.

This qualification prepares trainees for a wide range of roles in the mechanical engineering industry at management and/or advanced technical level, and comprises three sections.

The first section is compulsory and covers skills considered core to all mechanical engineering staff working at an advanced trade level.

The second is an elective section, which allows for a wide choice of applied study in the areas of mechanical engineering, business and management. Trainees can therefore select those standards most appropriate to a particular role, for example: foreman, leading hand, supervisor, technical expert or process champion.

The third section comprises five strands, which reflect the major sectors of work within the mechanical engineering industry. These strands provide flexibility through elective standards which can be chosen to match the range of work available in the trainee's enterprise.

Typically, the qualification will be gained during the course of an eighteen month part-time training programme.

The qualification must be completed with at least one of the following strands:

The **Engineering Fabrication** strand is for those employed within the engineering fabrication industries who work with sheets, plates, sections, and pipes to produce a wide variety of metal products, machines, structures and other equipment, by cutting, forming, shaping and assembling components; or who are involved in the manufacture and installation of structural steel components for building and civil engineering projects.

The **Fire Protection** strand is for those employed within the fire protection industry, whose work may involve the design, installation, commissioning, testing, and servicing of fire protection systems.

The **General and Maintenance Engineering** strand is for those employed: on engineering maintenance work in enterprises where the emphasis is on maintaining reliable production, possibly in a lean (competitive) manufacturing environment; in contract maintenance work for such enterprises; or in a general engineering workshop.

The **Mechanical Services** strand is for those employed within the refrigeration, heating, ventilating, and air conditioning industries installing, commissioning, servicing and maintaining: commercial refrigeration and/or air conditioning equipment; industrial single or multi-stage refrigeration systems, or heating, ventilating and air conditioning systems for industrial and office buildings.

The **Precision Engineering** strand is for those working in the toolmaking and precision machining industries. Enterprises in these industries typically employ sophisticated CNC mills and lathes to produce engineering components to high degrees of measurement tolerance and finish.

This qualification is a progression from the Level 4 national certificates listed in the Special Notes below. The qualification has some credits in common with, and can lead to, the National Diploma in Engineering (Level 6) with strands in Mechanical Engineering, Production Engineering, and Mechanical Services, and with an optional strand in Practical Endorsement [Ref: 0534].

Replacement Information

This qualification replaced the:

- National Certificate in Engineering - Fabrication (Level 5) with strands in Heavy Fabrication, Light Fabrication, and Welding [Ref: 0681],
- National Certificate in Maintenance and Diagnostics in Mechanical Engineering (Level 5) [Ref: 0718],
- National Certificate in Engineering Machining and Toolmaking (Level 5) [Ref: 0719],
- National Certificate in Refrigeration and Air Conditioning (Level 5) [Ref: 0720],
- National Certificate in Fixed Fire Protection Systems (Level 5) [Ref: 0865],
- National Diploma in Fire Detection and Alarm Systems (Level 5) [Ref: 0866],
- National Diploma of Fire Protection Systems Technology (Certification of Fire Safety Systems) (Level 5) [Ref: 0867], and
- National Certificate in Heating, Ventilating, and Air Conditioning (Mechanical Services) (Level 5) [Ref: 0897].

Special Notes

Before commencing study towards this qualification it is recommended that trainees hold one of the following qualifications, or demonstrate equivalent knowledge and skills, relevant to the strand the trainee wishes to work towards:

- National Certificate in Engineering - Fabrication (Level 4) with strands in Heavy Fabrication, Light Fabrication, and Steel Construction [Ref: 0122]
- National Certificate in Fire Detection and Alarm Systems (Level 4) [Ref: 0569]
- National Certificate in Fire Protection Systems Technology (Inspection and Testing) (Level 4) [Ref: 0864]
- National Certificate in Fixed Fire Protection Systems (Level 4) [Ref: 0570]

- National Certificate in Heating, Ventilating, and Air Conditioning (Mechanical Services) (Level 4) [Ref: 0124]
- National Certificate in Mechanical Engineering (Level 4) with strands in Fitting and Machining, General Engineering, Machining, Maintenance Engineering, Toolmaking, and Electricity Supply [Ref: 1262]
- National Certificate in Refrigeration and Air Conditioning (Level 4) [Ref: 0130].

Candidates who wish to be assessed against standard 20800 are advised to first complete prerequisite standards 4797, 4800, 20799, and 20917. This can either be done as part of completing the Precision Engineering Strand or as part of one of the recommended prerequisite qualifications.

Credit Range

	Core Compulsory	Core Elective	Any Strand
Level 3 credits	13	0-14	-
Level 4 credits	6	0-14	0-5
Level 5 or above credits	4	11-25	25-30
Minimum totals	23	25	30
Qualification total with strand			78

Requirements for Award of Qualification

Award of NQF Qualifications

Credit gained for a standard may be used only once to meet the requirements of this qualification.

Unit standards and achievement standards that are equivalent in outcome are mutually exclusive for the purpose of award. The table of mutually exclusive standards is provided in section 7 of the New Zealand Qualifications Authority (NZQA) Rules and Procedures publications available at <http://www.nzqa.govt.nz/ncea/acrp/index.html>.

Reviewed standards that continue to recognise the same overall outcome are registered as new versions and retain their identification number (ID). Any version of a standard with the same ID may be used to meet qualification requirements that list the ID and/or that specify the past or current classification of the standard.

Summary of Requirements

- Core Compulsory standards
- Core Elective – A minimum of 25 credits as specified

One of the following strands is required

- Engineering Fabrication Strand
- Fire Protection Strand
- General and Maintenance Engineering Strand
- Mechanical Services Strand
- Precision Engineering Strand

Detailed Requirements

Core Compulsory

The following standards are required

Business > Business Operations and Development > Quality Management

ID	Title	Level	Credit
8085	Demonstrate knowledge of quality and its management	3	4
8087	Use core quality management tools	3	5

Business > Business Operations and Development > Systems and Resources Management

ID	Title	Level	Credit
1988	Supervise workplace operations	4	6

Engineering and Technology > Engineering > Generic Engineering

ID	Title	Level	Credit
11405	Prepare estimates of engineering project costings	5	4

Health > Occupational Health and Safety > Occupational Health and Safety Practice

ID	Title	Level	Credit
17602	Apply hazard identification and risk assessment procedures in the workplace	3	4

Core Elective

A minimum of 25 credits

- Of which a minimum of 11 credits at Level 5 or above

Business > Accounting > Accounting - Generic

ID	Title	Level	Credit
7380	Recognise and examine management control concepts	3	3

Business > Business Operations and Development > People Development and Coordination

ID	Title	Level	Credit
1987	Develop strategies to establish and maintain positive workplace relationships	4	5
8493	Provide leadership for a team in an organisation	5	10
25463	Manage a plan to achieve organisational objectives	5	10

Business > Business Operations and Development > Quality Management

ID	Title	Level	Credit
8078	Lead a team to achieve specified quality improvement objectives	5	6
20849	Develop and implement a plan to gather, analyse and report on information for management of quality	5	10

Business > Financial Management > Financial Skills

ID	Title	Level	Credit
18956	Demonstrate knowledge of financial management for a small operational business	4	6

Education > Generic Education and Training > Assessment of Learning

ID	Title	Level	Credit
4098	Use standards to assess candidate performance	4	6

Engineering and Technology > Engineering > Generic Engineering

ID	Title	Level	Credit
11408	Demonstrate an ability to prepare and submit a tender for an engineering project	5	2

REVIEWED

Engineering and Technology > Mechanical Engineering > Applied Principles of Mechanical Engineering

ID	Title	Level	Credit
11386	Apply principles of lubrication to rotating and sliding machine elements	6	10
21772	Apply sketching techniques and produce drawings for mechanical engineering	4	11
21773	Demonstrate and apply knowledge of mechanical statics for mechanical engineering	4	15
21775	Demonstrate knowledge of mathematical principles for mechanical engineering	3	15
21779	Demonstrate and apply knowledge of mechanical engineering planning	5	15
21781	Explain and apply laws of thermodynamics in mechanical engineering	5	15
21785	Demonstrate knowledge of and test materials for mechanical engineering applications	5	15
21787	Demonstrate and apply electrical and electronic knowledge to mechanical engineering	5	15
21788	Demonstrate and apply knowledge of manufacturing processes and equipment for mechanical engineering	5	15
21789	Demonstrate and apply knowledge of maintenance planning for mechanical engineering	6	15
22918	Demonstrate and apply knowledge of project management in mechanical engineering	6	15

Engineering and Technology > Mechanical Engineering > Engineering Core Skills

ID	Title	Level	Credit
26326	Demonstrate knowledge of new technology developments relevant to the mechanical engineering industry	5	5

Engineering and Technology > Mechanical Engineering > Engineering - Materials

ID	Title	Level	Credit
20800	Demonstrate knowledge of engineering tool steels	5	5

Engineering and Technology > Mechanical Engineering > Maintenance and Diagnostics in Mechanical Engineering

ID	Title	Level	Credit
11401	Carry out tests and measurements using approved procedures within mechanical engineering contexts	5	10

Humanities > Communication Skills > Interpersonal Communications

ID	Title	Level	Credit
9704	Manage interpersonal conflict	4	6

Humanities > Communication Skills > Writing

ID	Title	Level	Credit
9685	Write an analytical report	5	5

Service Sector > Service Sector Skills > Service Sector - Core Skills

ID	Title	Level	Credit
376	Employ customer service techniques for differing customer behaviours in a given situation	3	2

Engineering Fabrication Strand

A minimum of 30 credits at Level 4 or above

- Of which a minimum of 25 credits at Level 5 or above

Field	Subfield	Domain
Engineering and Technology	Mechanical Engineering	Engineering - Fabrication
		Mechanical Engineering Inspection
		Welding

Fire Protection Strand

A minimum of 30 credits at Level 4 or above

- Of which a minimum of 25 credits at Level 5 or above

Field	Subfield	Domain
Engineering and Technology	Mechanical Engineering	Fire Detection and Alarm Systems
		Fire Protection Systems Technology
		Fixed Fire Protection Systems

General and Maintenance Engineering Strand

A minimum of 30 credits at Level 4 or above

- Of which a minimum of 25 credits at Level 5 or above

Field	Subfield	Domain
Engineering and Technology	Mechanical Engineering	Engineering - Measurement
		Engineering - Robotics
		Fluid Power - Hydraulics
		Fluid Power - Pneumatics
		Maintenance and Diagnostics in Mechanical Engineering
		Mechanical Commissioning

Mechanical Services Strand

A minimum of 30 credits at Level 4 or above

- Of which a minimum of 25 credits at Level 5 or above

Field	Subfield	Domain
Engineering and Technology	Mechanical Engineering	Heating, Ventilating, and Air Conditioning
		Refrigeration and Air Conditioning

Precision Engineering Strand

A minimum of 30 credits at Level 4 or above

- Of which a minimum of 25 credits at Level 5 or above

Field	Subfield	Domain
Engineering and Technology	Mechanical Engineering	Engineering Drawing and Design
		Engineering Machining and Toolmaking
		Engineering - Materials
		Engineering - Measurement
		Engineering Patternmaking

Transition Arrangements

Version 1

This qualification replaced the:

- National Certificate in Engineering - Fabrication (Level 5) with strands in Heavy Fabrication, Light Fabrication, and Welding [Ref: 0681],
- National Certificate in Maintenance and Diagnostics in Mechanical Engineering (Level 5) [Ref: 0718],
- National Certificate in Engineering Machining and Toolmaking (Level 5) [Ref: 0719],
- National Certificate in Refrigeration and Air Conditioning (Level 5) [Ref: 0720],
- National Certificate in Fixed Fire Protection Systems (Level 5) [Ref: 0865],
- National Diploma in Fire Detection and Alarm Systems (Level 5) [Ref: 0866],
- National Diploma of Fire Protection Systems Technology (Certification of Fire Safety Systems) (Level 5) [Ref: 0867], and
- National Certificate in Heating, Ventilating, and Air Conditioning (Mechanical Services) (Level 5) [Ref: 0897].

Differences between the qualifications

- A single qualification was introduced to reflect common skills and knowledge relevant across mechanical engineering industries.
- The qualification was structured to include a mixture of core compulsory, core elective, and strand elective components.

- The core compulsory standards reflect pan-industry requirements.
- The core elective standards allow selection of skills relevant to an individual’s role within a particular enterprise.
- Industry specific strands were introduced to recognise particular industry requirements.
- The strands were designed to provide maximum flexibility for employers by listing domains rather than specific standards.
- The overall credit total was reduced from between 100 and 317 to 78 to better reflect industry requirements.
- New standards were included to reflect current industry requirements.

For detailed information see [Review Summaries](#) on the NZQA website.

People currently working towards qualifications Refs: 0681, 0718, 0719 and 0720 have until 31 December 2012 to complete their assessments; alternatively they can transfer to the new qualification. Because there are standards in these qualifications that expire in December 2011, trainees will need to check the expiry date of any standards they have yet to complete.

Qualifications Refs: 0865, 0866, 0867 and 0897 have never been used and have no candidates enrolled in courses leading to them so the decision has been made to let them **expire immediately**.

It is intended that all new trainees from July 2010 will be enrolled in an appropriate strand of the new National Certificate in Mechanical Engineering (Level 5) [Ref: 1545].

For those electing to transfer to the new qualification, the following table shows the most appropriate strand within the National Certificate in Mechanical Engineering (Level 5) [Ref: 1545].

Qualification	Recommended strand in National Certificate in Mechanical Engineering (Level 5) [Ref: 1545]
National Certificate in Engineering – Fabrication (Level 5) with strands in Heavy Fabrication, Light Fabrication, and Welding [Ref: 0681]	Engineering Fabrication
National Certificate in Engineering Machining and Toolmaking (Level 5) [Ref: 0719]	Precision Engineering
National Certificate in Fixed Fire Protection Systems (Level 5) [Ref: 0865]	Fire Protection
National Certificate in Heating, Ventilating, and Air Conditioning (Mechanical Services) (Level 5) [Ref: 0897]	Mechanical Services
National Certificate in Maintenance and Diagnostics in Mechanical Engineering (Level 5) [Ref: 0718]	General and Maintenance Engineering
National Certificate in Refrigeration and Air Conditioning (Level 5) [Ref: 0720]	Mechanical Services
National Diploma in Fire Detection and Alarm Systems (Level 5) [Ref: 0866]	Fire Protection
National Diploma in Fire Protection Systems	Fire Protection

Technology (Certification of Fire Safety Systems) (Level 5) [Ref: 0867]	
---	--

Industry will continue to recognise the former qualifications and there is no requirement for people who hold the replaced qualifications or have demonstrated equivalent knowledge and skills to 'upgrade' to the new qualification.

This qualification contains standards that replace and have been substituted for expiring standards. For the purposes of this qualification, people who have gained credit for the expiring or substituted standards are exempt from the requirement to gain credit for the replacement or substitute standards – see table below.

Credit for	Exempt from
2438	21772
2439	21772
4803	20800
7452	25463
11387	21781
11388, 11389	21773
11394	21785
11395, 11396	21787
11397	21788

Please note that all of the standards on the left side of the table, except for standard 7452, expire on 31 December 2012 and must not be assessed against after that date. Standard 7452 expires in December 2011 and must not be assessed against after that date.

Competenz will publicise these arrangements in the trade press and the Competenz website <http://www.competenz.org.nz/>, and by direct communication with apprentices and their employers.

It is not intended that anyone be disadvantaged by this review, and the above arrangements have been designed for a smooth transition. However, anyone who feels they have been disadvantaged may appeal to Competenz at the address below.

Other standard setting bodies whose standards are included in the qualification

InfraTrain New Zealand
 New Zealand Industry Training Organisation
 NZQA

Certification

This certificate will display the logos of NZQA, Competenz and the accredited organisation.

Classification

This qualification is classified according to the NQF classification system and the New Zealand Standard Classification of Education (NZSCED) system as specified below.

DAS Classification		NZSCED	
Code	Description	Code	Description
212	Engineering and Technology > Mechanical Engineering	030701	Engineering and Related Technologies > Mechanical and Industrial Engineering and Technology > Mechanical Engineering

Quality Management Systems

Providers and Industry Training Organisations must be accredited by a recognised Quality Assurance Body before they can register credits from assessment against standards. Accredited providers and Industry Training Organisations assessing against standards must engage with the moderation system that applies to those standards. Accreditation requirements and the moderation system are outlined in the associated Accreditation and Moderation Action Plan (AMAP) for each standard.

Review