

National Certificate in Electronic Engineering (Level 3)

Level 3

Credits 117

This qualification has been **reviewed**. The last date to meet the requirements is 31 December 2021.

Transition Arrangements

Version 3 of this qualification was republished in December 2018 to change its last date for assessment from 31 December 2022 to 31 December 2021.

Version 3 of this qualification was republished in December 2017 to extend its last date for entry into programmes from 31 December 2017 to 31 December 2018.

This qualification has been reviewed and, in conjunction with the National Certificate in Electrical Engineering (Electrical Appliance and Electronic Servicing (Level 3) [Ref: 1265], has been replaced by the New Zealand Certificate in Electrotechnology (Level 3) with strands in Installation, and Service [Ref: 2767].

This qualification contains expiring standards. For the purposes of this qualification, people who have gained credit for the expiring standards are exempt from the requirement to gain credit for the replacement standards – see below.

| Credit for | Exempt from |
|------------|--------------|
| 6401, 6402 | 26551, 26552 |
| 29465 | 15851 |
| 29477 | 15856 |

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

People working towards this qualification may complete its requirements or transfer their results to the replacement New Zealand qualification.

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 2021, when the qualification will be discontinued. From this date, no results can be reported against the qualification.

It is recommended that candidates currently enrolled in programmes leading to this qualification and unable to complete it by 31 December 2021 transfer their existing achievement to the replacement qualification.

It is anticipated that no existing candidates will be disadvantaged by these transition arrangements. However, anyone who feels that they have been disadvantaged may appeal to The Skills Organisation at the address below. Appeals will be considered on a case-by-case basis.

NZQF National Qualification Registration Information

| Process | Version | Date | Last Date for Assessment |
|--------------|---------|----------------|--------------------------|
| Registration | 1 | April 2004 | December 2013 |
| Review | 2 | September 2011 | December 2019 |
| Review | 3 | May 2015 | December 2021 |
| Republished | 3 | December 2017 | December 2021 |
| Republished | 3 | December 2018 | December 2021 |

Standard Setting Body

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National Certificate in Electronic Engineering (Level 3)

Level 3

Credits 117

Purpose

The National Certificate in Electronic Engineering (Level 3) is an intermediate qualification for electronics technicians.

This qualification combines electronics theory with practical measurement, diagnostics, and industry generic skills, which provides a firm foundation for practical employment and for the assimilation of specific product and system knowledge. The qualification leads to further on-job and off-job learning towards full technician status at Level 4 and beyond.

Holders of the qualification will have met the requirements of either the *Electrical Appliance Serviceperson (endorsed to disconnect and connect)* or the *Electrical Service Technician* electrical registration classes which are covered by Elective 2.

The Electrical Workers Registration Board examinations are the only assessment tool for unit standards 27349, *Demonstrate knowledge of theory and legislation for registration of electrical service technicians* and 27350, *Demonstrate knowledge of theory and legislation for registration of electrical appliance servicepersons (endorsed)*.

Holders of this qualification have demonstrated knowledge and skill in the following areas:

- mathematics and mechanics;
- soldering and de-soldering;
- electrical safe working practices;
- electrical circuit engineering principles;
- electrotechnology workshop fabrication skills;
- research in the electrotechnology industry;
- fault finding techniques;
- prevention of electrostatic damage;
- digital and analogue electronics;
- test equipment;
- first aid;
- signals and the transmission of information;
- microcontrollers and
- practical mathematics for electronics technicians.

The qualification has two elective sections. Elective 1 covers:

- battery testing and selection and charging;
- signals and the transmission of information;
- microcontrollers;
- soldering and de-soldering of surface mounted devices, terminals, and components, and printed circuit board repair.

Six credits can also be selected from the Electronics Technology domain on the New Zealand Qualifications Framework.

Elective 2 covers the specific theory and practical requirements for licensing classes to allow candidates to meet the requirements of either the *Electrical Appliance Serviceperson (endorsed to disconnect and connect)* or the *Electrical Service Technician* registration classes. The common components of these two licensing classes are included in the compulsory section of the qualification. To meet the requirements of either of these licensing classes and the qualification, candidates are required to select at least one of Set C or Set D from Elective 2.

People with this *Electrical Appliance Serviceperson (endorsed to disconnect and connect)* class of registration are permitted to:

- a maintain appliances that have an electrical rating of not more than 250 volts that are supplied by plug and flexible cord;
- b disconnect and connect appliances described in (a) above from a power supply where a plug or appliance connector is not fitted but the flexible cord is connected to a permanent connection unit;
- c test work described in (a) and (b) above;
- d certify work described in (a) and (b) above; and
- e supervise any work described in (a) to (d) above.

People with this *Electrical Service Technician* class of registration are permitted to:

- a carry out maintenance of fittings that are connected to conductors used in electrical works or installations;
- b carry out maintenance of electrical appliances;
- c disconnect and connect fittings and appliances from and to a power supply, other than by means of a plug or pin inserted into a socket, or an appliance connector inserted into an appliance inlet; for the purpose of the maintenance of those fittings;
- d test work described (a) to (c) above;
- e certify work described in (a) to (c) above; and
- f supervise any work described in (a) to (e) above.

Candidates who have achieved credits towards the domain of Electronics Technology, which is the basis for the National Certificate in Electronics Technology (Level 3) [Ref: 1005], delivered in a number of high schools at Year 13, can use up to six credits towards Elective 1 Set B of this qualification.

This qualification may follow the National Certificate in Electrical Engineering (Level 2) [Ref: 0174], and lead to the National Certificate in Electronic Engineering (Level 4) [Ref: 1123], and the New Zealand Diploma in Engineering [112950]. Some of the credits from this qualification could also be used for the National Certificate in Electronic Manufacturing (Level 3) [Ref: 0434].

Replacement Information

Version 1 of this qualification replaced the National Certificate in Electronics Technology (Intermediate) (Level 3) [Ref: 0408].

Special Notes

- 1 Entry to the qualification is open.
- 2 Use of the term *Electronic Engineering* in the title of this and corresponding higher level qualifications is intended to convey the industry sector, expressed in the content by the inclusion of industry generic and safety skills, as well as fundamental electronics theory. By contrast, the term *Electronics Technology*, as in the National Certificate in Electronics Technology (Level 2) [Ref: 0240], indicates the absence of such additional skills.
- 3 To meet the requirements of Electrical Appliance Serviceperson (endorsed to disconnect and connect) electrical licensing class, candidates must achieve all units in Elective 2 Set C.
- 4 To meet the requirements of Electrical Service Technician electrical licensing class, candidates must achieve all units in Elective 2 Set D.
- 5 The electronic theory unit standards 20432 and 20433 have been designed to lead naturally to corresponding standards at Level 4, which in turn integrate with national diploma unit standards.

Credit Range

| | Compulsory | Elective 1 | Elective 2 |
|--------------------------|------------|------------|------------|
| Level 2 credits | 20 | 0-10 | - |
| Level 3 | 60 | 0-10 | 8 or 13 |
| Level 4 or above credits | 16 | 0-10 | 3 or 5 |
| Minimum totals | 96 | 10 | 11 or 18 |

Requirements for Award of Qualification

Award of NZQF National 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 on the New Zealand Qualifications Authority (NZQA) website: <http://www.nzqa.govt.nz/qualifications-standards/standards/standards-exclusion-list/>.

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

- Compulsory standards
- Elective 1 – A minimum of 10 credits as specified
- Elective 2 – as specified

Detailed Requirements

Compulsory

The following standards are required

Engineering and Technology > Electrical Engineering > Core Electrical

| ID | Title | Level | Credit |
|-------|--|-------|--------|
| 1178 | Follow safe practices in an electrical workplace | 2 | 3 |
| 15847 | Demonstrate knowledge of mathematics and mechanics for electrical trades | 2 | 4 |
| 15849 | Perform manual soldering and de-soldering procedures for electrotechnology work | 2 | 2 |
| 15851 | Demonstrate knowledge of electrical safety and safe working practices for electrical workers | 2 | 3 |
| 15856 | Demonstrate knowledge of the New Zealand electricity supply system | 3 | 2 |

Engineering and Technology > Electrical Engineering > Electrical Appliance Servicing

| ID | Title | Level | Credit |
|-------|---|-------|--------|
| 18082 | Replace faulty motors in electrical appliances | 4 | 4 |
| 22763 | Service electrical or electronic goods to gain electrical service technician's registration | 4 | 10 |

Engineering and Technology > Electrical Engineering > Electrical Service Technicians

| ID | Title | Level | Credit |
|-------|--|-------|--------|
| 17799 | Demonstrate knowledge of testing for electrical safety for electrical service technicians - single phase | 2 | 2 |
| 17802 | Replace fuses and plug-in miniature circuit breakers | 3 | 1 |
| 17803 | Select and connect flexible cords in single phase plug-in and fixed wired applications | 3 | 2 |
| 17806 | Demonstrate knowledge of protection from the harmful effects of electricity | 3 | 2 |
| 17808 | Isolate electrical appliances from the supply | 3 | 1 |

Engineering and Technology > Electrical Engineering > Electrical Standards and Statutes

| ID | Title | Level | Credit |
|-------|---|-------|--------|
| 27352 | Demonstrate knowledge of supervision of trainees undertaking prescribed electrical work | 4 | 2 |

Engineering and Technology > Electrical Engineering > Electrotechnology

| ID | Title | Level | Credit |
|-------|---|-------|--------|
| 16991 | Demonstrate and apply knowledge of electrotechnology engineering workshop safe practice | 3 | 5 |

| ID | Title | Level | Credit |
|-------|--|-------|--------|
| 26727 | Describe and apply techniques for identifying and locating faults in electrotechnology products or systems | 3 | 5 |

Engineering and Technology > Electronic Engineering > Core Electronics

| ID | Title | Level | Credit |
|-------|---|-------|--------|
| 5934 | Prevent electrostatic damage to electronic components | 2 | 1 |
| 20430 | Demonstrate and apply fundamental knowledge of d.c. principles for electronics technicians | 3 | 7 |
| 20431 | Demonstrate and apply fundamental knowledge of a.c. principles for electronics technicians | 3 | 7 |
| 20432 | Demonstrate and apply fundamental knowledge of digital electronics for electronics technicians | 3 | 7 |
| 20433 | Demonstrate and apply fundamental knowledge of analogue electronics for electronics technicians | 3 | 7 |
| 20434 | Demonstrate knowledge of practical mathematics for electronics technicians | 3 | 8 |
| 20615 | Use electronic test equipment | 3 | 6 |

Health > Health Studies > First Aid

| ID | Title | Level | Credit |
|-------|---|-------|--------|
| 26551 | Provide first aid for life threatening conditions | 2 | 1 |
| 26552 | Demonstrate knowledge of common first aid conditions and how to respond to them | 2 | 1 |

Humanities > Communication Skills > Writing

| ID | Title | Level | Credit |
|------|----------------------|-------|--------|
| 3492 | Write a short report | 2 | 3 |

Elective 1

A minimum of 10 credits from the following sets

- Set A
- Set B

Set A

A minimum of 4 credits

Engineering and Technology > Electronic Engineering > Core Electronics

| ID | Title | Level | Credit |
|-------|--|-------|--------|
| 8195 | Test and select batteries used in electronic applications and select suitable chargers | 3 | 4 |
| 19745 | Demonstrate and apply elementary knowledge of wireless transmission | 2 | 5 |

| ID | Title | Level | Credit |
|-------|---|-------|--------|
| 19747 | Demonstrate and apply fundamental knowledge of microcontrollers | 3 | 5 |

Engineering and Technology > Electronic Engineering > Electronic Installation and Maintenance

| ID | Title | Level | Credit |
|------|---|-------|--------|
| 8213 | Diagnose and repair a faulty microprocessor or microcontroller system | 4 | 6 |
| 8218 | Carry out soldering and de-soldering of printed circuit board mounted components and printed circuit board repair | 3 | 8 |

Set B

A maximum of 6 credits

| Field | Subfield | Domain |
|----------------------------|------------------------|------------------------|
| Engineering and Technology | Electronic Engineering | Electronics Technology |

Elective 2

Meet the requirements of 1 of the following sets

- Set C
- Set D

Set C

The following standards are required

Engineering and Technology > Electrical Engineering > Electrical Service Technicians

| ID | Title | Level | Credit |
|-------|---|-------|--------|
| 17801 | Demonstrate knowledge of single phase motors for electrical service technicians | 4 | 3 |
| 17804 | Test single phase electrical appliances | 3 | 2 |
| 17805 | Disconnect and reconnect fixed wired single phase electrical appliances | 3 | 3 |

Engineering and Technology > Electrical Engineering > Electrical Standards and Statutes

| ID | Title | Level | Credit |
|-------|--|-------|--------|
| 27350 | Demonstrate knowledge of theory and legislation for registration of electrical appliance servicepersons (endorsed) | 3 | 3 |

Set D

The following standards are required

Engineering and Technology > Electrical Engineering > Core Electrical

| ID | Title | Level | Credit |
|------|---|-------|--------|
| 1174 | Disconnect and reconnect fixed wired electrical appliances or equipment | 3 | 4 |

Engineering and Technology > Electrical Engineering > Electrical Service Technicians

| ID | Title | Level | Credit |
|-------|---|-------|--------|
| 17809 | Demonstrate knowledge of single and three-phase motors for electrical service technicians | 4 | 5 |
| 17810 | Connect single and three-phase electrical appliances and fittings | 3 | 3 |
| 17811 | Test single and three-phase electrical appliances | 3 | 3 |

Engineering and Technology > Electrical Engineering > Electrical Standards and Statutes

| ID | Title | Level | Credit |
|-------|--|-------|--------|
| 27349 | Demonstrate knowledge of theory and legislation for registration of electrical service technicians | 3 | 3 |

Transition Arrangements**Version 2**

Version 2 was issued following review.

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

| Credit for | Exempt from |
|------------|--------------|
| 6400 | 26551, 26552 |
| 6401 | 26552 |
| 6402 | 26551 |
| 8191 | 26727 |

Previous version of the qualification

Changes to structure and content included: the credit value increased from 97 to 117; compulsory standards 57, 1978, 2780, and 10933 - 10936 removed from the qualification; elective standard 8216 removed from the qualification; standard 26727 replaced standard 8191; standard 8213 added to Elective 1; standard 20434 moved from the elective to compulsory; standard 8195 moved from the compulsory to Elective 1; standard 27350

added to Elective 2; standards 1178, 17799, 17802, 17803, 17806, 17808, 22763, and 27352 added to meet the requirements of the changes to the electrical licensing classes; standards 17801, 17804, 17805, and 27350, added to Elective 2 Set C for people wishing to register as an Electrical Appliance Serviceperson (endorsed to disconnect and connect); standards 1174, 17809, 17810, 17811, and 27349 added to Elective 2 Set D for people wishing to register as an Electrical Service Technician; and standards 26551, 26552 replaced standards 6401 and 6402.

Version 1 of the qualification replaced the National Certificate in Electronics Technology (Intermediate) (Level 3) [Ref: 0408] which no longer met industry requirements for the training of new technicians. Changes to structure and content included: significant differences, in terms of content; updated unit standards; improved pathways between lower and higher level qualifications in electronics; improved assessability; greater flexibility in delivery of programmes; introduction of a small elective component and; change of credit value from 105 to 97. The last date for award of the National Certificate in Electronics Technology (Intermediate) (Level 3) [Ref: 0408] is 31 December 2010.

Other standard setting bodies whose standards are included in the qualification

NZQA

Certification

This certificate will display the logos of NZQA, The Skills Organisation and the name of the accredited organisation.

Classification

This qualification is classified according to the classification system listed on the Directory of Assessment Standards (DAS) and the New Zealand Standard Classification of Education (NZSCED) system as specified below.

| DAS Classification | | NZSCED | |
|--------------------|---|--------|--|
| Code | Description | Code | Description |
| 412 | Engineering and Technology > Electronic Engineering | 031303 | Engineering and Related Technologies > Electrical and Electronic Engineering and Technology > Electronic Engineering |

Quality Management Systems

Providers and Industry Training Organisations must be granted consent to assess by a recognised Quality Assurance Body before they can register credits from assessment against standards. Organisation with consent to assess and Industry Training Organisations assessing against standards must engage with the moderation system that applies to those standards. Consent to assess requirements and the moderation system are outlined in the associated Consent and Moderation Requirements (CMR) for each standard.