

# 2019

## Programme Handbook

### NZ2387 NZ Certificate in Electrical Engineering Theory (Level 3)

Credit Value

120



## School of Construction

## School Welcome

Welcome to the School of Construction, we hope you enjoy the time you are here studying with us. The teaching staff listed below are experts in their field and are looking forward to sharing their knowledge with you so that you can start your Electrical Trades career. You will learn the practical skills and theory that a trainee electrician needs in their daily work. This programme will give you a broad-based training in all aspects of the industry.

## Programme Staff

To find out your tutors names please check their names against the courses they are teaching on your timetables. To contact yours tutors by text please use the phones listed (if you are reporting an absence please email or phone the administrator).

Title	Name	Phone	Email
Head of School	Neil McDonald	04 920 2613	<a href="mailto:Neil.mcdonald@weltec.ac.nz">Neil.mcdonald@weltec.ac.nz</a>
Programme Manager	Phill Brinkley	04 8303091	<a href="mailto:Nigel.phillipson@weltec.ac.nz">Nigel.phillipson@weltec.ac.nz</a>
Administrator	Barbara Coley	04 9202710	<a href="mailto:barbara.coley@weltec.ac.nz">barbara.coley@weltec.ac.nz</a>
Tutors	Graeme Briggs	04 8300745	<a href="mailto:graeme.briggs@weltec.ac.nz">graeme.briggs@weltec.ac.nz</a>
	Ross Dixon	04 8302009	<a href="mailto:ross.dixon@weltec.ac.nz">ross.dixon@weltec.ac.nz</a>
	Tony Dellabarca	04 9202474	<a href="mailto:tony.dellabarca@weltec.ac.nz">tony.dellabarca@weltec.ac.nz</a>
	Chris Meehan	04 8500899	<a href="mailto:chris.meehan@weltec.ac.nz">chris.meehan@weltec.ac.nz</a>
	Neil Parker	04 8300894	<a href="mailto:neil.parker@weltec.ac.nz">neil.parker@weltec.ac.nz</a>
	Riaan Du Toit	04 8303128	<a href="mailto:riaan.dutoit@weltec.ac.nz">riaan.dutoit@weltec.ac.nz</a>
	Mary Graham		<a href="mailto:mary.graham@weltec.ac.nz">mary.graham@weltec.ac.nz</a>
	Bart Milne		<a href="mailto:Bartholomew.milne@weltec.ac.nz">Bartholomew.milne@weltec.ac.nz</a>

## Your Programme Handbook

This handbook provides information specific to your programme of study this year. You will also receive a Course Outline for each course you are enrolled in during the first week of your study. The Student Guide provides all other information you will need to support your study, including policies and procedures that apply to students. You will find the Student Guide on the website.

## Programme Aim

The aim of this programme is to provide students with introductory knowledge and practical skills for the electrical industry and is suitable for those students who wish to enter the industry but do not yet have an electrical apprenticeship agreement. Students will develop literacy and numeracy skills relevant to the electrical industry, and for further study.

## Pathways

**Employment:** Graduates will be equipped with the skills, knowledge, and attributes to work in apprenticeships in the electrical industry in the field of their choice with guidance, mentoring, and supervision in accordance with the Electricity Act 1992. Examples of roles that this qualification may lead to are Electricity Supply Electrical Apprentice, Domestic/Commercial Electrical Apprentice, or Industrial Electrical Apprentice, or apprenticeships in other electrical related sectors. Graduates may also be able to work in areas such as electrical wholesaling or retailing as a counter sales person, or electrical meter readers.

**Education:** This qualification provides one of two entry pathways into the electrical industry and is intended for candidates who do not have an electrical apprenticeship agreement. The second entry pathway is through an apprenticeship agreement where candidates will be signed directly into the New Zealand Certificate in Electrical Engineering Theory and Practice (Trade) (Level 4) [Ref: 2388]. On completion of this qualification, graduates may progress to higher level qualifications within the electrical industry such as the New Zealand Certificate in Electrical Engineering Theory and Practice (Trade) (Level 4) [Ref: 2388], or the New Zealand Diploma in Engineering [Ref: 112950]. Graduates may also progress to degree level programmes. This qualification is not a prerequisite for the New Zealand Certificate in Electrical Engineering Theory and Practice (Trade) (Level 4) [Ref: 2388]. However, credits gained towards this qualification will contribute towards that qualification.

## Programme Outline

*Why study this programme?*

Students will:

- Gain an understanding of electrical theory
- Learn the use of test instruments
- Develop skills in freehand drawing
- Carry out basic wiring
- Learn to diagnose and fix faults

*Target groups:*

- School leavers
- Persons who have completed a pre-trade qualification at Level 1 or 2
- People wanting to retrain for entry into the electrical trades

*Graduates will have:*

- The necessary skills and knowledge to ensure they are work ready, to enter an electrical apprenticeship.
- The ability to use and maintain electrical equipment, in order to carry out practical wiring and testing of electrical systems.
- Learn safe worksite practice and acquire the ability to identify electrical hazards.

*Career Opportunities:*

- This programme may help you gain entry into the industry as an electrical apprentice, or employment as an appliance service technician, electrical fitter or electronics service person. Other opportunities include security installation or retail electrical work.

## Structure

This is a competency based one-year programme, consisting of eight 15-credit courses based around 22.5 hours' theory and practical face-to-face delivery per week. The learning outcomes of the programme are aligned to the graduate profile of the New Zealand qualification and meet the requirements of the EWRB's (Electrical Workers Registration Board), Essential Capabilities.

The sequence of learning through the programme ensures learners progressively develop key skills and underpinning knowledge prior to their specific application in an integrated way.

The Health and Safety course (Electrical Work Practices) is designed to make sure the learner is consistently using procedures that will keep themselves safe and others around them. Because of the high level of health risk involved in the industry, the Health and Safety course runs concurrently with the other seven courses, and picks up all the health and safety features within those courses.

To ensure the graduate profile of this qualification is met, the learning outcomes throughout the programme are measured and assessed by a range of assessments that have been mapped against the qualification specifications of the graduate profile.

While work experience is recommended, it is not mandatory to complete this programme of study.

Collectively, course learning outcomes and their underpinning assessment criteria ensure that learners successfully

completing the programme meet the graduate profile requirements for the New Zealand Certificate in Electrical Engineering (Level 3) Theory.

The programme structure enables learners to develop industry skills and knowledge as well as practical application of those skills.

This programme will include

- Fundamental and key concepts and knowledge of the electrical industry.
- Safety requirements and regulations relating to the electrical industry.
- Applied knowledge to install, maintain, and repair electrical equipment in a controlled environment.
- Candidates must hold a current First Aid certificate before they can be awarded this qualification.
- A mandatory Unit Standard 29484 Demonstrate knowledge of theory and practice for electrical workers is a capstone assessment set by Skills ITO.

## Content

This programme of study is to provide training that leads to the award of the New Zealand Certificate in Electrical Engineering Theory (Level 3) qualification. It will provide learners with the fundamental knowledge and skills of Health and safety requirements, electrical principles, installations and circuit design under limited supervision.

### **Electrical Work Practices**

To acquire fundamental, operational and theoretical knowledge of electrical work practices including safety.

### **DC Fundamentals**

To introduce fundamental knowledge and principles of Direct Current (DC) electrical installation practices.

### **Installation Fundamentals**

To introduce fundamental knowledge and principles of electrical installation practices, and associated legislation and standards.

### **Electrical Applications**

To understand and apply fundamental knowledge of electrical theory and practice to the installation and maintenance of electrical systems and equipment.

### **Electricity Systems**

To extend knowledge of electrical systems and applications of direct and alternating current

### **Electricity Supply and Distribution**

To gain understanding of the fundamentals of the New Zealand electricity supply system and devices used to ensure the safety and protection of users and installations.

### **Circuit Design and Operation**

To understand the theory and application of electrical diagrams in terms of circuit design and lighting installations.

### **Electrical Machines**

To understand the theory and application of electrical machine protection, fault diagnosis, special power supplies and rotating machines.

### **Structure and Coherence**

This is a competency based one-year programme, consisting of eight, 15 credit courses based around 22.5 hours of theory/practical face-to-face delivery per week. The learning outcomes of the programme are aligned to the graduate profile of the New Zealand qualification and meet the requirements of the Electrical Workers Registration Board's (EWRB) Essential Capabilities.

The sequence of learning through the programme ensures students progressively develop key skills and underpinning knowledge prior to their specific application in an integrated way.

To ensure the graduate profile of this qualification is met, the learning outcomes throughout the programme are measured and assessed by a range of assessments that have been mapped against the qualification specifications of the graduate profile.

Collectively, course learning outcomes and their underpinning assessment criteria ensure that students successfully completing the programme meet the graduate profile requirements for the New Zealand Certificate in Electrical Engineering Theory (Level 3).

The programme structure enables students to develop industry skills and knowledge as well as practical application of those skills.

This programme includes:

- Fundamental and key concepts and knowledge of the electrical industry
- Safety requirements and regulations relating to the electrical industry
- Applied knowledge to install, maintain, and repair electrical equipment in a controlled environment
- First Aid training and certification

WelTec Course	Whitireia Course	Course Title	Level	Credit	Compulsory or Elective	Pre / Co requisite
EE3102	ELEC3021	Electrical Work Practices	3	15	Compulsory	Nil
EE3103	ELEC3022	DC Fundamentals	3	15	Compulsory	Nil
EE3104	ELEC3023	Installation Fundamentals	3	15	Compulsory	Nil
EE3105	ELEC3024	Electrical Applications	3	15	Compulsory	Nil
EE3107	ELEC3025	Electricity Systems	3	15	Compulsory	Nil
EE3108	ELEC3026	Electricity Supply and Distribution	3	15	Compulsory	Nil
EE3109	ELEC3027	Circuit Design and Operation	3	15	Compulsory	Nil
EE3110	ELEC3028	Electrical Machines	3	15	Compulsory	Nil

## Teaching and Learning Methods

### Teaching philosophy

This programme uses an on-site work-integrated learning approach (WIL) (Martin, Rees & Edwards, 2011) that has a strong focus on gaining applied knowledge and practical skills within an Infrastructure skills learning environment.

Work-integrated learning is based on an experiential learning philosophy that views learning as “cyclical process involving observation, reflection and action” (Dewey as cited in Martin, Rees & Edwards, 2011, p. 28). It recognises that adult learners come with a diverse range of past experiences and approaches to learning; this prior experience is acknowledged and used as a foundation and resource for new learning and contributes positively to the learning experience of others.

In addition to gaining specific discipline related knowledge and skills, WIL emphasizes the development of transferable ‘soft skills’ that are required for success in the workplace. These include professional conduct, self-confidence, communication, people skills and teamwork (Martin, Rees & Edwards, 2011).

There will be a focus on embedding the safety requirements and regulations relating to the electrical industry throughout the teaching and learning of this programme. Students demonstrate their understanding and apply their knowledge of safety requirements and regulations in all practical activities.

## Self-directed learning activities

To enhance the likelihood of success, students are advised to undertake the following activities independently of, but following guidance from, course tutors. These activities are allocated time within the overall programme hours and more specifically identified within each course.

Independent self-directed activities include:

Activity	Evidence
Assessment preparation	Student completes assignment/s on time, and is prepared for supervised assessments
Laboratory / workshop	Student practices skills or develops outputs to meet assessment task requirements
Group study	Notes, activities or output meet assessment task requirements
Independent study	Student engages in a variety of tutor recommended or self-selected materials to meet assessment outcomes
Information gathering, readings	Student discusses gathered information in tutor-directed activities, and in assessment (including evidence for portfolio)
Observation	Student reflects on work place practice in relation to theoretical and practical learning
Project work	Defined project outcomes are progressively achieved
Other	Define evidence of students having engaged in this activity.

Tutors advise students of the activities relevant to each course in course outlines.

## Literacy and Numeracy

Literacy and numeracy skill development is integrated throughout all courses and embedded in the learning and assessment. In achieving all the graduate outcomes, student will have demonstrated that they can:

- accurately record written information
- write for a specific purpose and audience
- read and understand a range of text from a variety of sources
- recognise and use specialised vocabulary and terminology in context
- use numbers accurately to solve context specific problems
- respond to dialogue appropriately and with understanding
- record accurately from spoken instructions or requests

## Assessments

The grade method is GM1.

To pass each course, students must achieve competence in all assessments to pass each course.

Further assessment is conducted within the Academic Statute – section 4 Regulations.

This programme limits further attempts to up to two (2) attempts per assessment.

## Assessment methods

The programme uses competency-based assessment. Assessment methods may include: portfolio, written and practical tests.

The assessment philosophy of this programme of study focuses on promoting and measuring effective learner learning. It places value on both formative and summative assessments that establish and maintain appropriate standards of achievement.

All assessments will be aligned to the level of the programme in terms of the literacy and numeracy required and recognises the literacy and numeracy of the learners. This will help to ensure that the language of the assessment does not become a barrier to learners achieving the measureable vocational and content specific outcomes of the program.

The aims of learner assessment in this programme are to:

- Provide valid and reliable means of evaluating learner work in relation to learning outcomes. The standards are those that are acceptable to the wider academic and professional community. The standards are made explicit to learners prior to any assessment events.
- Assess development of content knowledge as well as skills and attitudes.
- Promote effective learner learning and self-awareness through the provision of clearly understood assessment procedures, constructive feedback and evaluation of learner work.
- Develop further learners' own critical faculties through their exposure to, and involvement in, assessment processes.
- Develop capability in learners for self-evaluation.

Integration of practical and theoretical knowledge is essential to working effectively in Electrical Engineering fields. Reflecting this, integrated assessments are central to the philosophy of this programme. Whilst assessments develop the academic skills of learners, the New Zealand Certificate in Electrical Engineering Theory (Level 3) is vocational by nature and the assessments reflect this. For example, practical scenarios are used to assess skill and knowledge of safe working practices; team projects assess the ability to communicate and attitude; practical skill is assessed in project-based evaluations to ensure workplace readiness of graduates.

Teaching staff are mindful of the impact that workload has on learner learning. Integrated assessment will be used in instances where it is possible to assess a number of outcomes with a common assessment task. Both formative and summative assessment of foundational competencies will occur in association with other learning outcomes where appropriate.

Assessment for this course will be project and portfolio based and, where possible, based on naturally occurring activities. Learners will assemble a portfolio of evidence that demonstrates their knowledge and skills. The following assessment methods are used as formative and/or summative tools. Each method identified may be utilised to assess theory and/or practical applications and may utilise on-line learning where appropriate.

### **Portfolio**

The portfolio may include a range of assessment activities including:

- Tutor observations and attestations of safe working practices and communication skills while learners undertake project work
- Learner generated evidence of, and comments on, assessment activities completed as part of assigned projects
- Tutor led assessment/s for underpinning knowledge

### **Written tests**

Written examinations or tests may be closed or open-book and are a measure of learning within a controlled environment.

### **Peer and self-assessments**

Many tasks lend themselves to peer and/or self-assessment. Peer- and self-assessment reflect both the contexts in which graduating learners will work and the practices of working independently and in collaborative teams. They promote the development of reflection and critique and, where employed, will be carried out with agreed and explicit criteria.

## Simulated workshop tasks

Simulated workshop tasks will enable learners to be work-ready through the use of real world examples that require a problem solving approach. The programme will include learning activities designed to replicate the ongoing professional career development through application of knowledge to authentic tasks. Through simulated task learners will practice using the “language of the trade” and therefore be trade literate for a beginning practitioner. This aligns with the Industry specification for the initial education of a person entering the Electrotechnology trade.

Information on the assessment policies and procedures can be found in the Student Guide

## Progress through Programme

This programme is completed in one year, full time.

### Learning hours

Teaching weeks:	34	Teaching hours/week:	22.5
Vacation weeks:	3	Work experience hours/week:	0
		Self-directed learning hours/week:	12.8
Total gross weeks:	37	Total learning hours/week:	35.3

## Timetable

### Group A & B

Start Trimester One:	4 March 2019	Finish Trimester Two:	15 November 2019
Term breaks:	22 – 26 April, 8 – 12 July, 2 – 6 September		
Class time:	Monday, Tuesday, Wednesday - 8.00am – 4.30pm		

### Group C

Start Trimester One:	3 April 2019	Finish Trimester Three:	13 December 2019
Term breaks:	22 – 26 April, 8 – 12 July, 30 September – 4 October 2019		
Class time:	Wednesday, Thursday, Friday - 8.00am – 4.30pm		

### Group D

Start Trimester Two:	16 July 2019	Finish Trimester Three:	27 March 2020
Term breaks:	30 September – 4 October, 23 December – 10 January 2020		
Class time:	Tuesday, Thursday, Friday - 8.00am – 4.30pm		

## Other Information

Include this information ONLY if there are specific requirements in the Programme Document such as:

- **Health and Safety** policies and procedures apply and are identified to the students.  
The programme operates under approved policy and procedures. Standard Operating Procedures (SOPs) are clearly set out for all practical processes and the use and storage of equipment and dangerous goods. All electrical appliances have annual safety compliance checks. The Health and Safety in Work Act 2015 is acknowledged and followed.
- **Course materials and equipment**  
Students will need to provide a calculator, a suitable set of basic electrical tools and pouch, plus personal protection equipment (PPE) for this programme. A list of these tools and PPE, along with suggested suppliers, is provided to all enrolled students.

Please refer to the Student Guide for all general information about studying here.

## Award of Qualification

Students must successfully complete all eight courses to be awarded the New Zealand Certificate in Electrical Engineering Theory (Level 3).