COMPANION VOLUME IMPLEMENTATION GUIDE

UEE Electrotechnology

Release 6.0

AUSTRALIAN INDUSTRY STANDARDS

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ABOUT AUSTRALIAN INDUSTRY STANDARDS

Australian Industry Standards (AIS) provides high-quality, professional secretariat services to eleven Industry Reference Committees (IRCs), in our role as a Skills Service Organisation (SSO).

The eleven allocated IRCs incorporate Gas, Electricity, Electrotechnology, Corrections, Public Safety (including Police, Fire Services, Defence), Water, Aviation, Rail, Maritime and Transport and Logistics industries. AIS supports these important industry sectors using our world-class in-house capability and capacity in technical writing, quality assurance, project management and industry engagement in the production of training packages.

AIS was established in early 2016, 20 years after its predecessor the Transport and Logistics Industry Skills Council (TLISC) was established in 1996. More information about AIS can be found on our website.

We support industry growth and productivity through our modern innovative approach to establishing skills standards
We provide high-quality, professional secretariat services to help our allocated IRCs develop the skills that industry needs
We partner with industry to shape the workforce of the future

OVERVIEW INFORMATION

This Companion Volume Implementation Guide (CVIG) is designed to assist assessors, trainers, Registered Training Organisations (RTOs) and enterprises in delivering the UEE Electrotechnology Training Package. It provides advice about the structure of the Training Package; its key features and useful links to more detailed information on a range of related topics.

Additional UEE Companion Volumes covering specific topics are available at VETNET.

VERSION CONTROL AND MODIFICATION HISTORY

Training Packages are dynamic documents and are amended periodically to reflect the latest industry practices. Training Packages are version controlled so it is essential that the latest release is always used.

In the version control and modification history table below, the latest information is provided first.

Version Number	Release Date	Comments
6.0	February 2023	This is the sixth release of this Training Package. Release 6.0 contains: 3 new Units of Competency • UEERS0020 Apply rail signalling principles • UEERS0026 Maintain communications based signalling equipment • UEERS0035 Maintain wayside asset protection equipment 15 updated Units of Competency • UEERS0021 Assemble and wire electrical rail signalling equipment • UEERS0022 Find and repair rail signalling system faults • UEERS0023 Inspect, test and certify rail power signal equipment • UEERS0024 Install and maintain rail track circuit leads and bonds • UEERS0025 Maintain active level crossing equipment • UEERS0027 Maintain computer-based interlocking rail systems • UEERS0028 Maintain mechanical rail signalling equipment and infrastructure • UEERS0029 Maintain non-vital telemetry systems • UEERS0030 Maintain power-operated point actuating devices • UEERS0031 Maintain rail signalling power supplies • UEERS0032 Maintain trackside signal and train protection equipment • UEERS0033 Maintain train detection equipment • UEERS0034 Maintain vital relay interlocking systems • UEERS0036 Repair rail signalling power and control cables • UEERS0037 Test copper rail signalling cables 2 new Skill Sets • UEESS00189 Rail Signalling Constructor Skill Set • UEESS00190 Electrical - Rail Signalling Principles Skill Set

		6 updated Qualifications • UEE41223 Certificate IV in Electrical – Rail Signalling • UEE30820 Certificate III in Electrotechnology Electrician • UEE33020- Certificate III in Electrical Fitting • UEE40620- Certificate IV in Electrotechnology - Systems Electrician • UEE43020- Certificate IV in Electrical Equipment and Systems • UEE53020- Diploma of Electrical Systems Engineering 5 Units of Competency deleted • UEECD0058 Observe safety practices are followed in the vicinity of isolated electrical cables • UEERS0002 Decommission electrical and electromechanical rail signalling from service • UEERS0003 Develop rail signalling system maintenance programs • UEERS0007 Install and maintain non-vital screen-based control systems • UEERS0015 Maintain electronic and microprocessor-based remote control systems
5.0	21 December 2022	This is the fifth release of this Training Package. Release 5.0 contains: 13 new Units of Competency • UEERE0051 Apply electrical principles to renewable energy design • UEERE0054 Conduct site survey for grid connected photovoltaic and battery storage systems • UEERE0055 Conduct site survey for off-grid photovoltaic/generating set systems • UEERE0057 Coordinate the design of micro-grid renewable energy systems • UEERE0058 Coordinate the installation, fault finding and repair of micro grid systems • UEERE0070 Fault find and repair grid-connected photovoltaic power supply systems • UEERE0071 Fault find and repair off-grid PV/genset systems to an electrical installation • UEERE0072 Inspect grid connected renewable energy systems • UEERE0073 Inspect micro grid renewable energy systems • UEERE0074 Inspect off-grid renewable energy systems • UEERE0079 Install off-grid power conversion equipment to electrical installation • UEERE0080 Install photovoltaic power conversion equipment to grid • UEERE0082 Maintain renewable energy (RE) apparatus

		25 updated Units of Competency • UEERE0052 Assess energy loads and uses for energy efficiency in commercial facilities • UEERE0053 Assess energy loads and uses for energy efficiency in industrial properties and enterprises • UEERE0056 Coordinate maintenance of renewable energy (RE) apparatus and systems • UEERE0059 Design energy management controls for electrical installations in buildings • UEERE0060 Design grid-connected battery storage systems • UEERE0061 Design grid-connected photovoltaic power supply systems • UEERE0062 Design micro-hydro systems • UEERE0063 Design off-grid photovoltaic/generating set systems • UEERE0064 Design renewable energy (RE) heating systems • UEERE0065 Design wind energy systems • UEERE0066 Develop effective engineering strategies for energy reduction in buildings • UEERE0067 Develop engineering solutions to renewable energy (RE) problems • UEERE0068 Develop strategies to address sustainability issues for electrical installations • UEERE0069 Diagnose and rectify faults in renewable energy (RE) control systems • UEERE0075 Install and maintain micro hydro energy systems to power conversion equipment • UEERE0076 Install and maintain wind energy systems to power conversion equipment • UEERE0077 Install battery storage equipment power conversion equipment to grid • UEERE0078 Install battery storage to power conversion equipment • UEERE0081 Install photovoltaic systems to power conversion equipment • UEERE0083 Maintain safety and tidiness of remote area power supply systems • UEERE0084 Manage renewable energy (RE) projects • UEERE0085 Plan renewable energy (RE) projects • UEERE0086 Promote sustainable energy practices • UEERE0087 Provide basic sustainable energy solutions for energy management in residential premises • UEERE0088 Work safely with remote area power supply systems 19 new Skill Sets

		• UEESS00191 Grid-connected Battery Storage Systems Designer-Installer Skill Set • UEESS00192 Grid-connected Battery Storage Systems Installer Skill Set • UEESS00196 Grid-connected Renewable Energy System Site Surveyor Skill Set • UEESS00197 Grid-connected Renewable Energy Systems Inspector Skill Set • UEESS00198 Hybrid Photovoltaic, Wind and Battery Storage Systems Installer Skill Set • UEESS00199 Micro-hydro Systems Designer Installer Skill Set • UEESS00200 Micro-hydro Systems Designer Skill Set • UEESS00201 Micro hydro systems Installer Skill Set • UEESS00202 Micro-grid Renewable Energy Systems Inspector Skill Set • UEESS00203 Micro-grid Systems Design Coordinator Skill Set • UEESS00204 Micro-grid Systems Installation and Maintenance Coordinator Skill Set • UEESS00205 Off-grid Photovoltaic/Generating Set Systems Designer-Installer Skill Set • UEESS00206 Off-grid Photovoltaic/Generating Set Systems Installer Skill Set • UEESS00207 Off-grid Photovoltaic Generating Set Systems Designer Skill Set • UEESS00208 Off-grid Renewable Energy System Site Surveyor Skill Set • UEESS00209 Off-grid Renewable Energy Systems Inspector Skill Set • UEESS00217 Wind Energy Systems Designer-Installer Skill Set • UEESS00218 Wind Energy Systems Designer Skill Set • UEESS00219 Wind Energy Systems Installer Skill Set 10 updated Skill Sets • UEESS00193 Grid-connected Photovoltaic and Battery Storage Systems Designer Skill Set • UEESS00194 Grid-connected Photovoltaic Systems Designer-Installer Skill Set • UEESS00195 Grid-connected Photovoltaic Systems Installer Skill Set • UEESS00210 Sustainable - Electrical Installations Sustainability Strategies Skill Set • UEESS00211 Sustainable - Energy Assessment of Commercial Facilities Skill Set • UEESS00212 Sustainable - Energy Assessment of Industrial Properties and Enterprises Skill Set • UEESS00213 Sustainable - Energy Assessment of Residential, Office and Retail Premises Skill Set • UEESS00214 Sustainable - Energy Efficiency Systems Designer Skill Set

		• UEESS00215 Sustainable - Energy Efficiency Systems Developer Skill Set • UEESS00216 Sustainable - Identify Energy Efficiency Strategies Skill Set 17 updated Qualifications • UEE40120 Certificate IV in Computer Systems • UEE40720 Certificate IV in Electronics and Communications • UEE41520 Certificate IV in Video and Audio Systems • UEE43220 Certificate IV in Industrial Automation and Control • UEE43322 Certificate IV in Electrical - Renewable Energy • UEE50122 Diploma of Computer Systems Engineering • UEE50520 Diploma of Electronics and Communications Engineering • UEE50722 Diploma of Renewable Energy Engineering • UEE50920 Diploma of Industrial Electronics and Control Engineering • UEE51020 Diploma of Instrumentation and Control Engineering • UEE60220 Advanced Diploma of Electronics and Communications Engineering • UEE60922 Advanced Diploma of Renewable Energy Engineering • UEE61521 Advanced Diploma of Instrumentation and Control Engineering • UEE61720 Advanced Diploma of Engineering Technology – Electronics • UEE62022 Advanced Diploma of Engineering Technology - Renewable Energy • UEE62220 Advanced Diploma of Electrical - Engineering • UEE62122 Advanced Diploma of Engineering Technology - Electrical 33 updated Qualifications with imported elective units • UEE10120 Certificate I in ElectroComms Skills • UEE20120 Certificate II in Split Air Conditioning and Heat Pump Systems • UEE20520 Certificate II in Computer Assembly and Repair • UEE20720 Certificate II in Data and Voice Communications • UEE20920 Certificate II in Electronic Assembly • UEE21020 Certificate II in Fire Alarms Servicing • UEE21220 Certificate II in Antennae Equipment • UEE21420 Certificate II in Remote Area Power Supply Maintenance • UEE21620 Certificate II in Security Assembly and Set-up • UEE21720 Certificate II in Technical Support • UEE21920 Certificate II in Electronics • UEE22120 Certificate II in Sustainable Energy (Career Start)

		• UEE30320 Certificate III in Custom Electronics Installations • UEE30420 Certificate III in Data and Voice Communications • UEE30620 Certificate III in Electrical Machine Repair • UEE30720 Certificate III in Switchgear and Controlgear • UEE30820 Certificate III in Electrotechnology Electrician • UEE30920 Certificate III in Electronics and Communications • UEE31420 Certificate III in Security Equipment • UEE32120 Certificate III in Appliance Service • UEE32220 Certificate III in Air Conditioning and Refrigeration • UEE40220 Certificate IV in Electrical - Data and Voice Communications • UEE40320 Certificate IV in Installation Inspection and Audits • UEE40520 Certificate IV in Electrical - Air Conditioning Split Systems • UEE40620 Certificate IV in Electrotechnology - Systems Electrician • UEE41020 Certificate IV in Energy Management and Control • UEE41120 Certificate IV in Electrical - Lift Systems • UEE41720 Certificate IV in Rail - Communications and Network Systems • UEE50420 Diploma of Electrical Engineering • UEE51120 Diploma of Engineering Technology - Refrigeration and Air Conditioning • UEE62420 Advanced Diploma of Engineering Technology - Air Conditioning and Refrigeration • UEE62520 Advanced Diploma of Air Conditioning and Refrigeration Engineering • UEE63020 Advanced Diploma of Electrical Systems Engineering 11 Units of Competency deleted • UEERE0002 Assemble and connect remote area power supplies • UEERE0005 Assess energy loads and uses for energy efficiency in residential, office and retail premises • UEERE0017 Maintain and repair facilities associated with remote area essential service operations • UEERE0024 Attend to breakdowns in remote area power supplies (RAPS) • UEERE0025 Carry out basic repairs to renewable energy (RE) apparatus • UEERE0026 Conduct checks in the demand side use of remote area power supplies (RAPS) • UEERE0028 Design hybrid renewable power systems • UEERE0035 Install ELV stand-alone photovoltaic power systems • UEERE0038 Install, configure and commission LV wind energy conversion systems rated up to 10 kW

		• UEERE0039 Install, set up and maintain ELV micro-hydro systems rated up to 6.4 kW • UEERE0040 Maintain and monitor remote area essential service operations 6 Qualifications deleted • UEE32020 Certificate III in Renewable Energy - ELV • UEE41620 Certificate IV in Renewable Energy • UEE42020 Certificate IV in Electrical - Photovoltaic systems • UEE43120 Certificate IV in Energy Efficiency and Assessment • UEE60420 Advanced Diploma of Computer Systems Engineering • UEE61820 Advanced Diploma of Engineering Technology - Computer Systems
4.0	24 October 2022	This is the fourth release of this Training Package. Release 4.0 contains: 16 new Units of Competency • UEECD0064 Interpret, produce and modify electrical drawings • UEEEL0077 Evaluate and report on performance of LV machines • UEEEL0079 Plan and analyse LV electrical apparatus and circuits • UEEEL0080 Design and analyse wiring systems, circuits, control and protection for electrical installations • UEEHA0016 Assess the fitness-for-purpose of explosion-protected equipment • UEEHA0017 Classify areas where a combustible dust hazard may arise • UEEHA0018 Classify areas where flammable gas or vapour hazards may arise • UEEHA0019 Conduct a conformity assessment review of explosion-protected equipment • UEEHA0021 Design explosion-protected of electrical systems and installations • UEEHA0024 Inspect, maintain and fit plugs/couplers for reeling, trailing and flexible cables - coal mining • UEEHA0027 Manage continuous supervision inspection of electrical installations for hazardous areas • UEEHA0028 Perform compliance audits of hazardous areas and related electrical installation • UEEHA0030 Repair reeling, trailing and flexible cables used in coal mining • UEEHA0036 Test reeling, trailing and flexible cables and their attachments used in coal mining • UEEHA0037 Verify compliance of repaired reeling, trailing and flexible cables and attachments - coal mining

		• UEEIC0051 Evaluate motor drive systems and diagnose faults 15 updated Units of Competency • UEEEL0078 Install and commission whole current electricity meters • UEEHA0020 Conduct detailed inspection of electrical installations for hazardous areas • UEEHA0022 Determine the explosion-protection requirements to meet a specified classified hazardous area • UEEHA0023 Develop and manage periodic electrical inspection and maintenance programs for hazardous areas • UEEHA0025 Install explosion-protected equipment and associated apparatus and wiring systems • UEEHA0026 Maintain equipment associated with hazardous areas • UEEHA0029 Plan electrical installations for hazardous areas • UEEHA0031 Supervise repair and overhaul of explosion-protected equipment type flameproof (Ex d) • UEEHA0032 Supervise repair and overhaul of explosion-protected equipment type increased safety (Ex e) • UEEHA0033 Supervise repair and overhaul of explosion-protected equipment type intrinsically safe (Ex i) • UEEHA0034 Supervise repair and overhaul of explosion-protected equipment type pressurised (Ex p) • UEEHA0035 Supervise repair and overhaul of explosion-protected rotating machines • UEEHA0038 Conduct visual and close inspection of electrical installations for hazardous areas • UEEHA0039 Supervise repair and overhaul of explosion-protected equipment type Group III ('t') • UEERA0098 Inspect, test and repair fire and smoke control features of mechanical services systems 2 updated Skill Sets • UEESS00187 Electrical - Install and Set Up Interval Metering Skill Set • UEESS00188 RAC - Inspect, Test and Repair Fire and Smoke Control Features of Mechanical Services Systems 3 updated qualifications • UEE42622 Certificate IV in Hazardous areas – Electrical • UEE61222 Advanced Diploma of Engineering – Explosion protection • UEE62122 Advanced Diploma of Engineering Technology – Electrical
3.2	7 June 2022	This minor release of this Training Package. Release 3.2 contains:

		10 new Units of Competency • UEEEL0008 Evaluate and modify low voltage heating equipment and controls • UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and controls • UEEEL0010 Evaluate and modify low voltage socket outlets circuits • UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories • UEEEL0014 Isolate, test and troubleshoot low voltage electrical circuits 5 updated Units of Competency • UEEEL0003 Arrange circuits, control and protection for electrical installations • UEEEL0005 Develop and connect electrical control circuits • UEEEL0018 Select wiring systems and select cables for low voltage electrical installations • UEEEL0020 Solve problems in low voltage a.c. circuits • UEEEL0023 Terminate cables, cords and accessories for low voltage circuits
3.1	TBC	This minor release of this Training Package. Release 3.1 contains updates to imported superseded units in: 1 Unit of Competency • UEEEL0039 Design, install and verify compliance and functionality of general electrical installations 36 Qualifications • UEE20120 Certificate II in Split Air Conditioning and Heat Pump Systems • UEE20920 Certificate II in Electronic Assembly • UEE21020 Certificate II in Fire Alarms Servicing • UEE21220 Certificate II in Antennae Equipment • UEE21420 Certificate II in Remote Area Power Supply Maintenance • UEE21720 Certificate II in Technical Support • UEE22020 Certificate II in Electrotechnology (Career Start) • UEE22120 Certificate II in Sustainable Energy (Career Start) • UEE30120 Certificate III in Business Equipment • UEE30220 Certificate III in Computer Systems Equipment • UEE30320 Certificate III in Custom Electronics Installations • UEE30420 Certificate III in Data and Voice Communications • UEE30620 Certificate III in Electrical Machine Repair • UEE30720 Certificate III in Switchgear and Controlgear • UEE30820 Certificate III in Electrotechnology Electrician • UEE30920 Certificate III in Electronics and Communications

		• UEE31020 Certificate III in Fire Protection Control • UEE31220 Certificate III in Instrumentation and Control • UEE31420 Certificate III in Security Equipment • UEE32020 Certificate III in Renewable Energy - ELV • UEE32220 Certificate III in Air Conditioning and Refrigeration • UEE33020 Certificate III in Electrical Fitting • UEE40220 Certificate IV in Electrical - Data and Voice Communications • UEE40320 Certificate IV in Installation Inspection and Audits • UEE40620 Certificate IV in Electrotechnology - Systems Electrician • UEE40820 Certificate IV in Electrical - Fire Protection Control Systems • UEE40920 Certificate IV in Industrial Electronics and Control • UEE41120 Certificate IV in Electrical - Lift Systems • UEE41220 Certificate IV in Electrical - Rail Signalling • UEE41620 Certificate IV in Renewable Energy • UEE41720 Certificate IV in Rail - Communications and Network Systems • UEE42220 Certificate IV in Instrumentation and Control • UEE43020 Certificate IV in Electrical Equipment and Systems • UEE43220 Certificate IV in Industrial Automation and Control • UEE50320 Diploma of Electrical and Refrigeration and Air Conditioning • UEE51120 Diploma of Engineering Technology - Refrigeration and Air Conditioning
3.0	12 October 2021	This is the third release of this Training Package. Release 3.0 contains: 5 new Units of Competency • UEEL0075 Inspect, test and maintain emergency alarm systems and equipment • UEERA0096 Inspect, test and repair fire and smoke control features of mechanical services systems • UEERA0097 Install, commission, service and maintain variable refrigerant flow air conditioning systems • UEERE0049 Apply safe work practices in the rooftop solar industry • UEERE0050 Identify and isolate multiple supply systems 1 updated Unit of Competency • UEEEL0076 Inspect, test and maintain emergency lighting systems 4 new Skill Sets • UEESS00181 Electrical – Inspect, Test and Maintain Emergency Lighting and Alarm Systems and Equipment

		• UEESS00182 Identify and Isolate Multiple Supply Systems • UEESS00183 RAC - Inspect, Test and Repair Fire and Smoke Control Features of Mechanical Services Systems • UEESS00184 RAC - Install, Commission, Service and Maintain Variable Refrigerant Flow Air Conditioning Systems 2 updated Skill Sets • UEESS00185 Sustainable - Designer-Installer of Grid Connected Photovoltaic Systems Skill Set • UEESS00186 Sustainable - Installer of Grid Connected Photovoltaic Systems Skill Set 1 transitioned Qualification • UEE61521Advanced Diploma of Instrumentation and Control Engineering Minor changes to a range of UEE Training Package components were made at the same time as products endorsed as part of Release 3.0 was published. This included: • Fixing minor errors in 10 Units of Competency • Fixing minor errors in 4 Qualifications • Adding units to the general electives of 18 Qualifications.
2.0	2 October 2020	This is the second release of this Training Package. Release 2.0 contains: • Seventy-nine (79) qualifications • Fifty (50) Skill Sets • Five hundred and thirty (530) Units of Competency
1.0	13 April 2017	This is the first release of this Training Package. Release 1.0 contains two new Units of Competency: • UEERE4001 Install, maintain and fault find battery storage systems for grid-connected photovoltaic systems and • UEERE5001 Design battery storage systems for grid-connected photovoltaic systems.

TRAINING PACKAGES, THE AUSTRALIAN QUALIFICATIONS FRAMEWORK AND COMPETENCY STANDARDS

Training Packages

Training Packages:

Specify the qualifications determined by industry groups and when required, by regulatory requirements to be most relevant for employment within the industry
Are developed by the relevant national IRCs in consultation with a range of stakeholders

Are recommended to the Australian Industry and Skills Committee (AISC) for endorsement by the Council of Australian Governments (COAG) Industry and Skills Council
Enable nationally recognised qualifications to be awarded through direct assessment of workplace competencies
Encourage the development and delivery of flexible training to suit individual needs and industry requirements
Support learning, training and assessment in a work-related environment, leading to verifiable workplace outcomes.

The title of each endorsed Training Package is unique and relates to the broad industry coverage of the Training Package.

Each Training Package has a unique national code assigned when the Training Package is endorsed, for example TLI.

Training and assessment using Training Packages must be conducted by a Registered Training Organisation (RTO) that has the qualification/s or specific unit/s of competency on its scope of registration.

New Standards for Registered Training Organisations (RTOs) 2015 came into effect on 1 July 2019 and are located on the Australian Government ComLaw website.

Information about these standards can be found at the:

Department of Education
Australian Skills Quality Authority

Standards for Training Packages apply to the design and development of Training Packages for endorsement by the authorising body.

Information about these current standards, including applicable templates, can be found at the Department of Employment, Skills, Small and Family Business website (https://www.dewr.gov.au/training-packages).

These templates describe mandatory and optional information that applies to units of competency, assessment requirements and qualifications.

Australian Qualifications Framework

The Australian Qualifications Framework (AQF) provides a comprehensive, nationally consistent framework for all qualifications in post-compulsory education and training in Australia. In the Vocational Education and Training (VET) sector the AQF enables national recognition of qualifications and Statements of Attainment.

The UEE Electrotechnology Training Package provides details of the units of competency that must be achieved to award AQF qualifications.

The rules around which units of competency can be combined to make up a valid AQF qualification are referred to as the packaging rules. The packaging rules must be followed to ensure the integrity of nationally recognised qualifications issued.

The packaging rules are defined within each qualification in a Training Package.

Competency Standards

The broad concept of industry competency is the ability to perform particular tasks and duties to the standard of performance expected in the workplace. Competency standards cover all aspects of workplace performance and involve:

Performing individual tasks
Managing a range of different tasks
Responding to contingencies or breakdowns
Dealing with the responsibilities of the workplace, including working with others.

Workplace competency is the ability to apply relevant skills and knowledge consistently over time and in the required workplace situations and environments.

Competency standards are determined by industry to meet industry skill needs and focus on what is expected of a competent individual in the workplace.

AUSTRALIAN QUALIFICATIONS FRAMEWORK QUALIFICATIONS, SKILL SETS AND UNITS OF COMPETENCY IN THE UEE ELECTROTECHNOLOGY TRAINING PACKAGE

Qualifications

The UEE Electrotechnology Training Package provides details of the Units of Competency that must be achieved to award AQF qualifications.

The rules around which Units of Competency can be combined to make up a valid AQF qualification are referred to as the packaging rules. The packaging rules must be followed to ensure the integrity of nationally recognised qualifications issued.

Codes and titles

There are mandatory conventions specified in the Standards for Training Packages for the titles and codes used in Training Packages and their components.

QUALIFICATION CODE *MANDATORY FIELD*	The qualification code contains the three alpha characters identifying the Training Package, a numeric character identifying the AQF level, a two numeric character sequence identifier, and two numeric characters identifying the year the qualification was endorsed. It must comply with the length specified in the AVETMIS Standard.
QUALIFICATION TITLE *MANDATORY FIELD*	A unique title that reflects the qualification outcome. It must comply with the length specified in the AVETMIS Standard (no more than 100 characters).

Extract from *Standards for Training Packages*

Extract from *Training Package Products Policy*

The title of each endorsed Training Package qualification is unique. Qualification titles use the following sequence:

- First, the qualification is identified as either Certificate I, Certificate II, Certificate III, Certificate IV, Diploma, Advanced Diploma, Graduate Certificate, or Graduate Diploma
- This is followed by the words 'in' for Certificates I to IV and Graduate Certificate, and 'of' for Diploma, Advanced Diploma and Graduate Diploma
- Then, the industry descriptor, for example Warehousing
- Then, if applicable, the occupational or functional stream in brackets, for example (Track Work)

Each qualification has an eight-character code where the:

- First three characters identify the Training Package

First number identifies the AQF qualification level
Second and third numbers identify a qualification's position in the sequence of qualifications at that AQF qualification level
Fourth and fifth numbers identify the year in which the qualification was endorsed

AQF Qualifications in the UEE Electrotechnology Training Package

Please see ***Attachment A***

Skill Sets

Codes and titles

Skill Sets are single Units of Competency or combinations of Units of Competency from an endorsed Training Package/s that link to a licensing or regulatory requirement or a defined industry need.

Source: Training Package Products Policy

A Skill Set is awarded with the issuing of a Statement of Attainment.

Each Skill Set has a code that is automatically issued by training.gov.au (TGA) where the:

First three characters identify the Training Package
Next two characters indicate that it is a Skill Set
Numbers identify the Skill Set's position in the sequence of Skill Sets

Skill Sets in the UEE Electrotechnology Training Package

Please see ***Attachment B***

Units of Competency

Codes and titles

Units of Competency are nationally agreed statements about the skills and knowledge required for effective performance in the workplace. They outline work outcomes as defined by regulatory requirements and agreed by industry.

As such, they identify the skills and knowledge (as outcomes) that contribute to the whole job function they do not describe how to perform a particular role.

Each Unit of Competency covers a specific work activity, the range of conditions under which the activity is conducted and the foundation skills essential to performance.

The same Unit of Competency (i.e. specific work activity) can be relevant across a range of AQF qualification levels. It is important to check the packaging rules in qualifications to establish how units can apply.

UNIT CODE *MANDATORY FIELD*	The unit code contains the three alpha characters identifying the Training Package, followed by alpha and/or numeric characters. It must comply with the length specified in the AVETMIS Standard (no more than 12 characters).
UNIT TITLE *MANDATORY FIELD*	The title concisely describes the unit outcome. It must comply with the length specified in the AVETMIS Standard (no more than 100 characters)

Extract from Standards for Training Packages

Extract from Training Package Products Policy

There are mandatory conventions specified in the *Standards for Training Packages* for the titles and codes used in Training Packages and their components.

The codes are assigned to Units of Competency when the Training Package is endorsed, or when new Units of Competency are added to an existing endorsed Training Package.

Each Unit of Competency has a specific character code where the:

First three characters identify the Training Package
Next character/s indicates the competency field
Numbers identify a unit's position in the sequence of units in the competency field in the Training Package.

Note: the alpha coding conventions used for competency disciplines were changed when transitioning from UEE11 to UEE. See ***Attachment F*** for an old to new comparison of discipline coding conventions.

Assessment Requirements

Each Unit of Competency has its own assessment requirements that identify the:

Performance evidence
Knowledge evidence
Assessment conditions

TITLE *MANDATORY FIELD*	Assessment Requirements for [insert Unit of Competency Code and Title]

The same code is used for the Unit of Competency and its associated assessment requirements.

Units of Competency in the UEE Electrotechnology Training Package

Please see ***Attachment C***

QUALIFICATION MAPPING INFORMATION

The qualification mapping information shows code and title changes and equivalency between different releases of UEE Electrotechnology Training Package qualifications.

UEE CVIG Qualification Mapping Information: Attachment A

SKILL SETS MAPPING INFORMATION

The Skill Set mapping information shows code and title changes and equivalency between different releases of UEE Electrotechnology Training Package Skill Sets.

UEE CVIG Skill Sets Mapping Information: Attachment B

UNIT OF COMPETENCY MAPPING INFORMATION

The Unit of Competency mapping information shows code and title changes and equivalency between different releases of UEE Electrotechnology Training Package Units of Competency.

UEE CVIG Units of Competency Mapping Information: Attachment C

PREREQUISITE UNITS OF COMPETENCY

Candidates must be deemed competent in the required prerequisite Unit/s of Competency prior to the determination of competency in the Units of Competency they appear in. In some Units of Competency, prerequisites are streamed to facilitate different industry pathways and care must be taken to ensure the correct prerequisite requirements are implemented.

The best way to accurately identify pre-requisite requirements is to refer to individual units; however, a separate companion volume contains details of all UEE and imported unit pre-requisites. The UEE Pre-requisites Companion Volume can be located at VETNet, however if there is any discrepancy between the companion volume and the actual units of competency the units of competency should be considered correct.

Information about satisfying superseded pre-requisites in imported Units of Competency is provided in ***Attachment E: Implementation Guidance.***

IMPORTED UNITS AND THEIR PREREQUISITE UNITS

The UEE Electrotechnology Training Package includes imported Units of Competency from other Training Packages.

Please check the relevant assessment requirements of the source Training Package by accessing the national training website www.training.gov.au (TGA) or a physical copy regarding any special conditions that may apply to the assessment of imported Units of Competency.

For up-to-date releases of the imported units, refer to www.training.gov.au or the respective SSO.

Where imported units are included in the core or electives of a qualification they do not count as units imported under the qualification packaging rule where:

> "units may be selected from any relevant nationally endorsed Training Package or accredited course"

The general elective units selected under the above packaging rule must contribute to the vocational outcomes of the qualification.

Where imported units are selected, care must be taken to ensure that all prerequisite units specified are complied with.

Please see Attachment D for a list of imported Units of Competency from other Training Packages. Information about satisfying superseded pre-requisites in imported Units of Competency is provided in Attachment E: Implementation Guidance.

REGULATION AND LICENSING IMPLICATIONS FOR IMPLEMENTATION

Persons employed in the electrotechnology industry need to fulfil competency and training requirements as detailed in the regulations relevant to their occupation and state/territory. Persons assessed as complying with these requirements are usually provided with some form of certification by the respective authority. These certificates are required by the relevant state/territory or before a person can work in the occupation or undertake the duties covered under the legislation. These certificates are separate to national VET qualifications issued by RTOs.

Electricians in any state/territory in Australia need to be able to demonstrate a set of minimum capabilities in order to be granted an electrician's licence.

What this means is that a person seeking an electrician's licence needs to be able to work competently and safely when performing tasks independently or under supervision.

In addition, they need to be able to carry out these tasks across a variety of industries and work environments.

In 2001, the National Uniform Electrical Licensing Advisory Council (NUELAC) released a uniform set of requirements for licensed electricians known as Essential Performance Capabilities (EPCs).

The list of EPCs provides advice to industry, particularly RTOs, about the regulatory requirements that an apprentice electrician must satisfy before being issued with an electrical licence.

Visit with ERAC website for a list of EPC requirements for licensed electricians.

Where applicable, Units of Competency, Skill Sets and qualifications in the UEE Electrotechnology Training Package Release 6.0 describe licensing and/or regulatory requirements related to the tasks they cover. These may differ between jurisdictions and should be checked with the appropriate regulator prior to commencing training and/or assessment.

Licensing and registration requirements that apply to specific industries and VET, vary between each jurisdiction, state and territory, and can regularly change. For a list or licensing and regulatory bodies please visit the ERAC website.

A Refrigerant Handling Licence must be held by any person who carries out work in relation to refrigeration and air conditioning (RAC) equipment.

The following statements appear in the Certificate III in Air Conditioning and Refrigeration to provide refrigeration and air conditioning licence requirements or Restricted Electrical Licence requirements, these are also listed in other relevant air conditioning and refrigeration qualifications:

- **Refrigerant Handling Licence:** The achievement of the qualification meets the training components for the full national Refrigerant Handling Licence which is required to work on refrigeration and air conditioning equipment that carries the risk of a fluorocarbon refrigerant being emitted while decanting the refrigerant or manufacturing, installing, commissioning, servicing, maintaining or decommissioning refrigeration and air conditioning equipment.
- **Refrigeration and Air Conditioning Occupational Licence:** Additional and/or other conditions may apply in some jurisdictions subject to regulations related to refrigeration/air conditioning work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.
- **Electrical Occupation Licence:** The achievement of this qualification with the core restricted electrical units meet the electrical regulatory requirements for related restricted electrical work in most state/territories. This is required to work on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).
- Air Conditioning and Refrigeration Licensing and registration requirements that apply to specific industries and VET, vary between each jurisdiction, state and territory, and can regularly change. For a list or licensing and regulatory bodies please visit the ARC Industry website.

Electrical Occupation (Restricted) licencing may vary between each jurisdiction, state and territory, and can regularly change. Units of Competency in the UEE Electrotechnology Training Package which cover Restricted Licences include codes which begin with UEE**RL**... Regulatory requirements in each jurisdiction should be checked prior to commencing training and assessment.

In some instances, additional information may be required to support licencing requirements in some jurisdictions. Further information is included in the Attachment E: Implementation guidance section of this Companion Volume.

IMPLEMENTATION INFORMATION

KEY FEATURES OF THE TRAINING PACKAGE AND THE INDUSTRY THAT WILL IMPACT ON THE SELECTION OF TRAINING PATHWAYS

Pathways define a sequence of learning or experience that can be followed to attain competency and describe the way in which training and assessment is undertaken in an education or training program. They are **not mandatory** and may vary depending on the qualification or training program, the needs of the individual and the industry.

The UEE Electrotechnology Training Package is flexible and many pathways can be constructed to align with individual requirements and business needs. RTOs can work with their clients to apply the flexibility available in the packaging rules to ensure 'fit for purpose outcomes'.

INDUSTRY SECTORS AND OCCUPATIONAL OUTCOMES OF QUALIFICATIONS

UEE Electrotechnology Training Package, qualifications and industry-specific Units of Competency align to occupations across the following sectors:

- Computer Systems
- Data and Voice Communications
- Electrical
- Electronic
- Instrument and Industrial Control
- Rail Signalling
- Refrigeration and Air Conditioning
- Renewable and Sustainable Energy

QUALIFICATION ENTRY REQUIREMENTS

Entry requirements are the knowledge, skills or experience required to enter a qualification. They may be expressed as Units of Competency, qualifications or vocational outcomes and **must** be demonstrated prior to commencing the qualification.

In the UEE Electrotechnology Training Package the following qualifications include entry requirements. All qualifications listed are post-trade training for Electricians or Electrical Fitters. The Entry Requirement Qualification or Licence is required to satisfy underpinning skill and knowledge requirements and prerequisites requirements of units contained within the qualifications.

Code	Qualification Title	Rationale
UEE40220	Certificate IV in Electrical - Data and Voice Communications	This is a post-trade qualification for Electricians.
UEE40320	Certificate IV in Installation Inspection and Audits	This is a post-trade qualification for Electricians.
UEE40420	Certificate IV in Electrical - Instrumentation	This is a post-trade qualification for Electricians.
UEE40520	Certificate IV in Electrical - Air Conditioning Split Systems	This is a post-trade qualification for Electricians.
UEE40620	Certificate IV in Electrotechnology - Systems Electrician	This is a post-trade qualification for Electricians.
UEE40820	Certificate IV in Electrical - Fire Protection Control Systems	This is a post-trade qualification for Electricians.
UEE40920	Certificate IV in Industrial Electronics and Control	This is a post-trade qualification for Electricians.
UEE41020	Certificate IV in Energy Management and Control	This is a post-trade qualification for Electricians.
UEE41120	Certificate IV in Electrical - Lift Systems	This is a post-trade qualification for Electricians.

Code	Qualification Title	Rationale
UEE41223	Certificate IV in Electrical – Rail Signalling	This is a post-trade qualification for Electricians and Electrical Fitters if jurisdictional requirements allow. Also dependent on STA requirements it can be completed in conjunction with the entry requirement qualification/s as long as the entry requirement qualification is completed prior to issuing the Certificate IV.
UEE41920	Certificate IV in Electrical - Renewable Energy	This is a post-trade qualification for Electricians.
UEE42120	Certificate IV in Electrotechnology – Electrical Contracting	This is a post-trade qualification for Electricians.
UEE42622	Certificate IV in Hazardous areas – Electrical	This is a post-trade qualification for Electricians.
UEE43020	Certificate IV in Electrical Equipment and Systems	This is a post-trade qualification for Electrical Fitters.
UEE50220	Diploma of Electrical and Instrumentation	This is a post-trade qualification for Electricians.
UEE50420	Diploma of Electrical Engineering	This is a post-trade qualification for Electricians.
UEE50720	Diploma of Renewable Energy Engineering	This is a post-trade qualification for Electricians.
UEE50920	Diploma of Industrial Electronics and Control Engineering	This is a post-trade qualification for Electricians.
UEE53020	Diploma of Electrical Systems Engineering	This is a post-trade qualification for Electrical Fitters.

Code	Qualification Title	Rationale
UEE60620	Advanced Diploma of Industrial Electronics and Control Engineering	This is a post-trade qualification for Electricians.
UEE60920	Advanced Diploma of Renewable Energy Engineering	This is a post-trade qualification for Electricians.
UEE61222	Advanced Diploma of Engineering - Explosion protection	This is a post-trade qualification for Electricians.
UEE62122	Advanced Diploma of Engineering Technology - Electrical	This is a post-trade qualification for Electricians.
UEE62220	Advanced Diploma of Electrical - Engineering	This is a post-trade qualification for Electricians.
UEE62320	Advanced Diploma of Electrical Engineering - Coal Mining	This is a post-trade qualification for Electricians.
UEE63020	Advanced Diploma of Electrical Systems Engineering	This is a post-trade qualification for Electrical Fitters.

SKILL SET ENTRY REQUIREMENTS

Entry requirements are the knowledge, skills or experience required to enter a Skill Set. They may be expressed as Units of Competency, qualifications or vocational outcomes and must be demonstrated prior to commencing the Skill Set.

In the UEE Electrotechnology Training Package the following Skill Sets include entry requirements.

Code	Skill Set Title	*Entry requirement* and rationale
UEESS00135	Instrumentation - Programmable Control Systems Skill Set	*UEECD0007 Apply work health and safety regulations, codes and practices in the workplace* Cover underpinning skills and knowledge.
UEESS00138	Data Communications - Test, Report and Rectify Faults in Data and Voice Installations Skill Set	*ACMA 'Open' Cabling Registration and nationally recognised endorsements for structured cable and optical fibre.*

Code	Skill Set Title	*Entry requirement* and rationale
		Required accreditation.
UEESS00139	Data Communications - Restricted Telecommunications Cabler Registration - ACMA Skill Set	*UEECD0042 Solve problems in ELV single path circuits* Cover underpinning skills and knowledge.
UEESS00140	Data Communications - Premises Cabling for NBN Rollout Skill Set	*Australian Communications and Media Authority (ACMA) 'Open' Cabling Registration.* Required accreditation.
UEESS00142	Data Communications - Plan an Integrated Cabling Installation System Skill Set	*Australian Communications and Media Authority (ACMA) 'Open' Cabling Registration.* Required accreditation.
UEESS00143	Instrumentation - Develop an Integrated System Interface for Access Through a Touch Screen Skill Set	*UEEIC0011 Develop electrical integrated systems* Cover underpinning skills and knowledge.
UEESS00144	Instrumentation - Develop Integrated Systems Skill Set	*UEECD0025 Lay wiring/cabling and terminate accessories for extra-low voltage (ELV) circuits* *OR* *UEEEL0023 Terminate cables, cords and accessories for low voltage circuits* *AND* *ICTICT203 Operate application software packages* Cover underpinning skills and knowledge.
UEESS00145	Instrumentation - Plan the Installation of Integrated Systems Skill Set	*UEECD0025 Lay wiring/cabling and terminate accessories for extra-low voltage (ELV) circuits* *OR* *UEEEL0023 Terminate cables, cords and accessories for low voltage circuits* Cover underpinning skills and knowledge.

Code	Skill Set Title	*Entry requirement* and rationale
UEESS00146	RAC - Design Ammonia Refrigeration Systems Skill Set	*UEERA0034 Establish heat loads for commercial refrigeration and/or air conditioning applications* *AND* *UEERA0042 Evaluate thermodynamic and fluid parameters of refrigeration systems* *OR* *Diploma of Air Conditioning and Refrigeration Engineering* *OR* *Advanced Diploma of Air Conditioning and Refrigeration Engineering* *OR* *Advanced Diploma of Engineering Technology - Air Conditioning and Refrigeration* Cover underpinning skills and knowledge.
UEESS00147	RAC- Design Complex Carbon Dioxide Refrigeration Systems Skill Set	
UEESS00148	RAC - Design Hydrocarbon Refrigeration Systems Skill Set	
UEESS00149	RAC - Design Secondary Refrigeration Systems Skill Set	
UEESS00150	RAC - Install and Commission Ammonia Refrigeration Systems Skill Set	*UEERA0053 Install, commission, service and maintain medium temperature systems* *AND* *UEERA0051 Install, commission, service and maintain air conditioning systems* *OR* *Certificate III in Air Conditioning and Refrigeration* Cover underpinning skills and knowledge.
UEESS00151	RAC - Install and Commission Carbon Dioxide Refrigeration Systems Skill Set	
UEESS00152	RAC - Install and Commission Flammable Refrigerant Air Cond. and Refrigeration Systems Skill Set	
UEESS00154	RAC - Service and Repair Ammonia Refrigeration Systems Skill Set	
UEESS00156	RAC - Service and Repair Carbon Dioxide Refrigeration Systems Skill Set	

Code	Skill Set Title	*Entry requirement* and rationale
UEESS00158	RAC - Service and Repair Secondary Refrigeration Systems Skill Set	
UEESS00155	RAC - Service and Repair Carbon Dioxide Refrigeration and Heat Pump Systems Skill Set	*UEERA0051 Install, commission, service and maintain air conditioning systems* *OR* *UEERA0089 Service refrigeration appliances* *OR* *Certificate III in Air Conditioning and Refrigeration* *OR* *Certificate III in Appliance Service* Cover underpinning skills and knowledge.
UEESS00157	RAC - Service and Repair Flammable Refrigerant Refrigeration and Air Conditioning Systems Skill Set	
UEESS00164	Sustainable - Energy Efficiency Auditor Skill Set	*Degree in Electrical Engineering, an Advanced Diploma or Diploma of Electrical Engineering or an electrical trade qualification from the UEE Electrotechnology Training Package or equivalent.* Cover underpinning skills and knowledge.
UEESS00177	Data Communications - Plan an Integrated Cabling Installation System - Electricians Skill Set	*Australian Communications and Media Authority (ACMA) 'Open' Cabling Registration* *OR* *a current electrical licence issued in an Australian state or territory.* Required accreditation.
UEESS00178	Electrical - Develop and Implement Maintenance Programs Skill Set	*UEEEL0039 Design, install and verify compliance and functionality of general electrical installations* *OR*
UEESS00179	Electrical - Install and Set Up Interval Metering Skill Set	

Code	Skill Set Title	*Entry requirement* and rationale
UEESS00180	Electrical - Plan, Manage and Report on Electrical Projects Skill Set	*a current 'Unrestricted Electrical Licence' issued in an Australian state or territory.* Required licence.
UEESS00181	Electrical – Inspect, Test and Maintain Emergency Lighting and Alarm Systems and Equipment	*UEEEL0039 Design, install and verify compliance and functionality of general electrical installations* *OR* *Certificate III in Electrotechnology Electrician* Required licence.
UEESS00183	RAC - Inspect, Test and Repair Fire and Smoke Control Features of Mechanical Services Systems	*Certificate III in Air Conditioning and Refrigeration* Covers underpinning skills and knowledge.
UEESS00184	RAC - Install, Commission, Service and Maintain Variable Refrigerant Flow Air Conditioning Systems	
UEESS00214	Sustainable - Energy Efficiency Systems Designer Skill Set	Degree in Electrical Engineering, an Advanced Diploma or Diploma of Electrical Engineering or an electrical trade qualification from the UEE Electrotechnology Training Package or equivalent. Cover underpinning skills and knowledge.
UEESS00215	Sustainable - Energy Efficiency Systems Developer Skill Set	
UEESS00216	Sustainable - Identify Energy Efficiency Strategies Skill Set	

PATHWAYS ADVICE

Generally, all qualifications in the UEE Electrotechnology Training Package are suitable for delivery via an Australian Apprenticeship pathway.

The Australian Apprenticeships website offers information about traineeships and apprenticeships and includes links to State and Territory Training Authorities (STAs) that monitor provision.

VET in Schools programs are packaged and delivered in a variety of ways across Australia. However, it is highly recommended that schools work together in partnership with an RTO where

qualifications or Skill Sets result in strong transferable skills relevant to the needs of the individual and commercial enterprises.

The UEE Electrotechnology Training Package qualifications provide pathways in the following disciplines:

- Computer Systems
- Data and Voice Communications
- Electrical
- Electronic
- Instrument and Industrial Control
- Rail Signalling
- Refrigeration and Air Conditioning
- Renewable and Sustainable Energy

Skill Set Pathways

UEE Training Package Skill Sets provide pathways to a range of UEE qualifications. The Table below show the AQF levels of qualifications the Skill Set provides a pathway to.

Code	Skill Set Title	Pathways
UEESS00131	Data Communications - ACMA 'Open' Cabling Provider Skill Set	AQF 3-6 UEE qualifications
UEESS00132	Data Communications - ACMA 'Restricted' Telecommunications Cabling Registration Skill Set	AQF 2-4 UEE qualifications
UEESS00133	Restricted - Disconnection/Reconnection of Fixed Wired Low Voltage Electrical Equipment	AQF 3 and 4 UEE qualifications
UEESS00134	Data Communications - Install Aerial Communication Cables Skill Set	AQF 3-6 UEE qualifications
UEESS00135	Instrumentation - Programmable Control Systems Skill Set	AQF 4-6 UEE qualifications
UEESS00136	Sustainable - Electrical Installations Sustainability Strategies Skill Set	AQF 4-6 UEE qualifications
UEESS00137	Data Communications - Install Below Ground Communication Cables Skill Set	AQF 3-6 UEE qualifications

Code	Skill Set Title	Pathways
UEESS00138	Data Communications - Test, Report and Rectify Faults in Data and Voice Installations Skill Set	AQF 3-6 UEE qualifications
UEESS00139	Data Communications - Restricted Telecommunications Cabler Registration - ACMA Skill Set	AQF 2-4 UEE qualifications
UEESS00140	Data Communications - Premises Cabling for NBN Rollout Skill Set	AQF 3-6 UEE qualifications
UEESS00141	Electrical - Providing Advice on Lighting Products Skill Set	AQF 3-6 UEE qualifications
UEESS00142	Data Communications - Plan an Integrated Cabling Installation System Skill Set	AQF 3-6 UEE qualifications
UEESS00143	Instrumentation - Develop an Integrated System Interface for Access Through a Touch Screen Skill Set	AQF 3-6 UEE qualifications
UEESS00144	Instrumentation - Develop Integrated Systems Skill Set	AQF 3-6 UEE qualifications
UEESS00145	Instrumentation - Plan the Installation of Integrated Systems Skill Set	AQF 3-6 UEE qualifications
UEESS00146	RAC - Design Ammonia Refrigeration Systems Skill Set	AQF 5 and 6 UEE qualifications
UEESS00147	RAC- Design Complex Carbon Dioxide Refrigeration Systems Skill Set	AQF 5 and 6 UEE qualifications
UEESS00148	RAC - Design Hydrocarbon Refrigeration Systems Skill Set	AQF 5 and 6 UEE qualifications
UEESS00149	RAC - Design Secondary Refrigeration Systems Skill Set	AQF 5 and 6 UEE qualifications
UEESS00150	RAC - Install and Commission Ammonia Refrigeration Systems Skill Set	AQF 3-6 UEE qualifications
UEESS00151	RAC - Install and Commission Carbon Dioxide Refrigeration Systems Skill Set	AQF 3-6 UEE qualifications

Code	Skill Set Title	Pathways
UEESS00152	RAC - Install and Commission Flammable Refrigerant Air Cond. and Refrigeration Systems Skill Set	AQF 3-6 UEE qualifications
UEESS00153	RAC - Operate Ammonia Refrigeration Plant Skill Set	AQF 3-6 UEE qualifications
UEESS00154	RAC - Service and Repair Ammonia Refrigeration Systems Skill Set	AQF 3-6 UEE qualifications
UEESS00155	RAC - Service and Repair Carbon Dioxide Refrigeration and Heat Pump Systems Skill Set	AQF 3-6 UEE qualifications
UEESS00156	RAC - Service and Repair Carbon Dioxide Refrigeration Systems Skill Set	AQF 3-6 UEE qualifications
UEESS00157	RAC - Service and Repair Flammable Refrigerant Refrigeration and Air Conditioning Systems Skill Set	AQF 3-6 UEE qualifications
UEESS00158	RAC - Service and Repair Secondary Refrigeration Systems Skill Set	AQF 3-6 UEE qualifications
UEESS00164	Sustainable - Energy Efficiency Auditor Skill Set	AQF 4-6 UEE qualifications
UEESS00169	Data Communications - Install and Modify Performance Data Communication Structured Cabling Skill Set	AQF 3-6 UEE qualifications
UEESS00170	Install and Modify Performance Data Communication Optical Fibre Cabling Skill Set	AQF 3-6 UEE qualifications
UEESS00171	Fire Detection and Alarm Systems - Installation, Maintenance, Commissioning and Servicing Skill Set	AQF 3-6 UEE qualifications
UEESS00172	Attachment of Cords and Plugs to Single Phase Low Voltage Electrical Equipment Skill Set	AQF 2-4 UEE qualifications
UEESS00173	Attachment of Cords/Cables and Plugs to Low Voltage Three Phase Electrical Equipment Skill Set	AQF 2-4 UEE qualifications

Code	Skill Set Title	Pathways
UEESS00174	Electrical Safety Testing of Electrical Cord Connected Equipment and Cord Assemblies Skill Set	AQF 2-4 UEE qualifications
UEESS00177	Data Communications - Plan an Integrated Cabling Installation System - Electricians Skill Set	AQF 3-6 UEE qualifications
UEESS00178	Electrical - Develop and Implement Maintenance Programs Skill Set	AQF 5 and 6 UEE qualifications
UEESS00179	Electrical - Install and Set Up Interval Metering Skill Set	AQF 3-6 UEE qualifications
UEESS00180	Electrical - Plan, Manage and Report on Electrical Projects Skill Set	AQF 5 and 6 UEE qualifications
UEESS00181	Electrical – Inspect, Test and Maintain Emergency Lighting and Alarm Systems and Equipment	AQF 3-6 UEE qualifications
UEESS00182	Identify and Isolate Multiple Supply Systems	AQF 4 UEE qualifications
UEESS00183	RAC - Inspect, Test and Repair Fire and Smoke Control Features of Mechanical Services Systems	AQF 3-6 UEE qualifications
UEESS00184	RAC - Install, Commission, Service and Maintain Variable Refrigerant Flow Air Conditioning Systems	AQF 3-6 UEE qualifications
UEESS00191	Grid-connected Battery Storage Systems Designer-Installer Skill Set	AQF 5 and 6 UEE qualifications
UEESS00192	Grid-connected Battery Storage Systems Installer Skill Set	AQF 4-6 UEE qualifications
UEESS00193	Sustainable - Designer of Grid Connected Photovoltaic Systems Skill Se	AQF 5 and 6 UEE qualifications
UEESS00194	Sustainable - Designer-Installer of Grid Connected Photovoltaic Systems Skill Set	AQF 5 and 6 UEE qualifications

Code	Skill Set Title	Pathways
UEESS00195	Sustainable - Installer of Grid Connected Photovoltaic Systems Skill Set	AQF 4-6 UEE qualifications
UEESS00196	Grid-connected Renewable Energy System Site Surveyor Skill Set	AQF 4-6 UEE qualifications
UEESS00197	Grid-connected Renewable Energy Systems Inspector Skill Set	AQF 5 and 6 UEE qualifications
UEESS00198	Hybrid Photovoltaic, Wind and Battery Storage Systems Installer Skill Set	AQF 4-6 UEE qualifications
UEESS00199	Micro-hydro Systems Designer Installer Skill Set	AQF 4-6 UEE qualifications
UEESS00200	Micro-hydro Systems Designer Skill Set	AQF 5 and 6 UEE qualifications
UEESS00201	Micro hydro systems Installer Skill Set	AQF 4-6 UEE qualifications
UEESS00202	Micro-grid Renewable Energy Systems Inspector Skill Set	AQF 5 and 6 UEE qualifications
UEESS00203	Micro-grid Systems Design Coordinator Skill Set	AQF 5 and 6 UEE qualifications
UEESS00204	Micro-grid Systems Installation and Maintenance Coordinator Skill Set	AQF 5 and 6 UEE qualifications
UEESS00205	Off-grid Photovoltaic/Generating Set Systems Designer-Installer Skill Set	AQF 5 and 6 UEE qualifications
UEESS00206	Off-grid Photovoltaic/Generating Set Systems Installer Skill Set	AQF 4-6 UEE qualifications
UEESS00207	Off-grid Photovoltaic Generating Set Systems Designer Skill Set	AQF 5 and 6 UEE qualifications
UEESS00208	Off-grid Renewable Energy System Site Surveyor Skill Set	AQF 4-6 UEE qualifications
UEESS00209	Off-grid Renewable Energy Systems Inspector Skill Set	AQF 5 and 6 UEE qualifications
UEESS00210	Sustainable - Electrical Installations Sustainability Strategies Skill Set	AQF 4-6 UEE qualifications

Code	Skill Set Title	Pathways
UEESS00211	Sustainable - Energy Assessment of Commercial Facilities Skill Set	AQF 4-6 UEE qualifications
UEESS00212	Sustainable - Energy Assessment of Industrial Properties and Enterprises Skill Set	AQF 4-6 UEE qualifications
UEESS00213	Sustainable - Energy Assessment of Residential, Office and Retail Premises Skill Set	AQF 4-6 UEE qualifications
UEESS00214	Sustainable - Energy Efficiency Systems Designer Skill Set	AQF 5 and 6 UEE qualifications
UEESS00215	Sustainable - Energy Efficiency Systems Developer Skill Set	AQF 5 and 6 UEE qualifications
UEESS00216	Sustainable - Identify Energy Efficiency Strategies Skill Set	AQF 5 and 6 UEE qualifications
UEESS00217	Wind Energy Systems Designer-Installer Skill Set	AQF 5 and 6 UEE qualifications
UEESS00218	Wind Energy Systems Designer Skill Set	AQF 5 and 6 UEE qualifications
UEESS00219	Wind Energy Systems Installer Skill Set	AQF 4-6 UEE qualifications

This following Skill Sets do not provide any articulation to any qualification or other unit of competency:

- UEESS00175 Apply Compliance Requirements to all Aspects of Electrical Work Skill Set
- UEESS00176 Apply Currency of Safe Working Practices and Compliance Verification of Electrical Installations

CREDIT ARRANGEMENTS

Currently there are no credit transfer arrangements between qualifications in the UEE Electrotechnology Training Package and higher education qualifications.

ACCESS AND EQUITY

Good vocational education and training, and assessment include making adjustments to meet the learning and assessment needs of individuals. An open mind, common sense and tailoring training and assessment to individual circumstances should ensure individuals achieve the standards employers and RTOs expect.

Adjustments can be made to assist learners to access and participate in vocational education and training. Adjustments are reasonable if they achieve this purpose and take into account factors such as the nature of the learner's ability and disability, the views of the learner, the potential effect of the adjustment on the learner and others, and the costs and benefits of making the adjustment.

Reasonable adjustments need only be that – reasonable. It is about identifying what adjustments might reasonably be made and how they may be put into place.

Assessment processes and techniques should be modified for distance-based learners, be culturally appropriate and suitable to the communication skill level, language, literacy and numeracy capacity of the candidate and the work being performed.

An individual's access to the assessment process should not be adversely affected by restrictions placed on the location or context of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

FOUNDATION SKILLS

Foundation skills is the term that the Australian Government uses in a number of different contexts, including vocational Units of Competency, to capture language, literacy and numeracy skills and employment skills.

Language, literacy and numeracy skills can make the difference between whether or not someone succeeds in training and at work. These important skills are now called 'core skills' or 'foundation skills' because they are at the core of – or the foundation to – other more specific technical skills.

All Units of Competency in UEE Electrotechnology Training Packages clearly describe the foundation skills that are essential to performance in the elements and performance criteria of the unit.

This is achieved with the use of key words or phrases to indicate foundation skills that are essential to performance. It is important to note that foundation skills may not have the same meaning in every instance and do need to be considered in the relevant job context.

The significance of each of these skills will also vary in respect to job roles and the strengths of individuals. It is important for users of the UEE Electrotechnology Training Package to contextualise relevant foundation skills identified in Units of Competency and performance criteria.

There is a distinction between 'core skills' and 'foundation skills' in Training Packages, which can be summarised as follows:

Core skills are those described in the ACSF: learning, numeracy, oral communication (speaking and listening), reading and writing.

Foundation skills is the term that the Australian Government uses in a number of different contexts, including vocational Units of Competency, to capture language, literacy and numeracy skills and employment skills.

Electrotechnology Units of Competency and qualifications will often cover complex scientific and mathematical concepts. Assessment of candidate's foundation skills should be undertaken prior to commencement, and where required, support strategies developed and implemented.

FSK Foundation Skills Training Package

The FSK Foundation Skills Training Package allows RTOs to choose and deliver foundation skills units, qualifications and Skill Sets that will enable learners to build the specific foundation skills they need to achieve vocational competency.

Foundation skills units provide additional information about the types of language, literacy and numeracy skills that are needed to meet the requirements of vocational units.

The Training Package can be downloaded from www.training.gov.au.

HEALTH AND SAFETY IMPLICATIONS IN THE INDUSTRY

Work health and safety (WHS) / occupational health and safety (OHS) has been used in Units of Competency to refer to the relevant legislation. As not all jurisdictions have implemented the Model Work Health and Safety (WHS) Act the combined term is used to recognise that either the national model or existing state instrument will apply, as specified by the relevant regulatory authority.

In jurisdictions where the Model WHS Act has not been implemented, RTOs are advised to contextualise the Unit of Competency by referring to the existing state OHS legislative requirements.

RESOURCES AND EQUIPMENT RELEVANT TO THE TRAINING PACKAGE

The assessment requirements relevant to each Unit of Competency refer to the relevant resources and equipment required for assessment.

Where a specific vehicle or piece of equipment is referred to, it must be used in the relevant assessment.

In particular, for assessment, access is required to:

A range of relevant exercises, case studies and/or simulations
A vehicle typical of that used in the industry
Applicable documentation including workplace procedures, regulations, codes of practice and operation manuals

Relevant materials, tools, equipment and personal protective equipment currently used in industry

Specific assessment requirements and strategies are defined in the relevant unit where applicable.

RTOs can only conduct training and/or assessment of the qualifications and/or Units of Competency in this Training Package provided they are covered by their Scope of Registration.

The assessment requirements for each Unit of Competency specify the relevant resources and equipment required to achieve the vocational outcomes of the UEE Electrotechnology Training Package.

LEGAL CONSIDERATIONS FOR LEARNERS IN THE WORKPLACE/ON PLACEMENTS

Legal requirements that apply to specific industries and VET vary across each state and territory, and the commonwealth, and can change. Contact relevant state/territory and commonwealth departments to determine specific legal requirements.

SUPPORTING LEARNER TRANSITION BETWEEN EDUCATION SECTORS

There are no formal transition arrangements between the VET sector and the higher education sector for the Units of Competency being submitted to the AISC.

LINKS

- ASQA Issuance Policy
- Australian Department of Education
- Australian Department of Education, Skills and Employment – Training Packages (including links to Standards and Policy)
- Australian Industry and Skills Committee (AISC)
- Australian Industry Standards (AIS)
- Australian Refrigeration Council (ARC)
- Australian Skills Quality Authority (ASQA)
- Electrical Regulatory Authorities Council (ERAC)
- ERAC Essential Performance Capability (EPC) requirements for licensed electricians
- National Register for Training in Australia (including all endorsed National Training Packages)

- State/Territory Electrical licensing and regulatory bodies
- Standards for Registered Training Organisations (RTOs) 2015
- UEE Electrotechnology Training Package Companion Volumes
- VETNet, for Training Package Companion Volumes and other support material

ATTACHMENT A: UEE TRAINING PACKAGE QUALIFICATIONS

The following AQF qualifications are in the UEE Electrotechnology Training Package:

Code	Qualification Title
AQF 1	
UEE10120	Certificate I in ElectroComms Skills
AQF 2	
UEE20120	Certificate II in Split Air Conditioning and Heat Pump Systems
UEE20520	Certificate II in Computer Assembly and Repair
UEE20720	Certificate II in Data and Voice Communications
UEE20920	Certificate II in Electronic Assembly
UEE21020	Certificate II in Fire Alarms Servicing
UEE21220	Certificate II in Antennae Equipment
UEE21420	Certificate II in Remote Area Power Supply Maintenance
UEE21620	Certificate II in Security Assembly and Set-up
UEE21720	Certificate II in Technical Support
UEE21920	Certificate II in Electronics
UEE22020	Certificate II in Electrotechnology (Career Start)
UEE22120	Certificate II in Sustainable Energy (Career Start)
AQF 3	
UEE30120	Certificate III in Business Equipment
UEE30220	Certificate III in Computer Systems Equipment
UEE30320	Certificate III in Custom Electronics Installations
UEE30420	Certificate III in Data and Voice Communications
UEE30620	Certificate III in Electrical Machine Repair
UEE30720	Certificate III in Switchgear and Controlgear
UEE30820	Certificate III in Electrotechnology Electrician
UEE33020	Certificate III in Electrical Fitting
UEE30920	Certificate III in Electronics and Communications
UEE31020	Certificate III in Fire Protection Control
UEE31220	Certificate III in Instrumentation and Control
UEE31420	Certificate III in Security Equipment

Code	Qualification Title
UEE32120	Certificate III in Appliance Service
UEE32220	Certificate III in Air Conditioning and Refrigeration
AQF 4	
UEE40120	Certificate IV in Computer Systems
UEE40220	Certificate IV in Electrical - Data and Voice Communications
UEE40320	Certificate IV in Installation Inspection and Audits
UEE40420	Certificate IV in Electrical - Instrumentation
UEE40520	Certificate IV in Electrical - Air Conditioning Split Systems
UEE40620	Certificate IV in Electrotechnology - Systems Electrician
UEE40720	Certificate IV in Electronics and Communications
UEE40820	Certificate IV in Electrical - Fire Protection Control Systems
UEE40920	Certificate IV in Industrial Electronics and Control
UEE41020	Certificate IV in Energy Management and Control
UEE41120	Certificate IV in Electrical - Lift Systems
UEE41223	Certificate IV in Electrical – Rail Signalling
UEE41520	Certificate IV in Video and Audio Systems
UEE41720	Certificate IV in Rail - Communications and Network Systems
UEE42120	Certificate IV in Electrotechnology – Electrical Contracting
UEE42220	Certificate IV in Instrumentation and Control
UEE42622	Certificate IV in Hazardous areas – Electrical
UEE42720	Certificate IV in Air Conditioning and Refrigeration Servicing
UEE42820	Certificate IV in Air Conditioning Systems Energy Management and Control
UEE42920	Certificate IV in Refrigeration and Air Conditioning Systems
UEE43020	Certificate IV in Electrical Equipment and Systems
UEE43220	Certificate IV in Industrial Automation and Control
UEE43322	Certificate IV in Electrical - Renewable Energy
AQF 5	
UEE50120	Diploma of Computer Systems Engineering
UEE50220	Diploma of Electrical and Instrumentation
UEE50320	Diploma of Electrical and Refrigeration and Air Conditioning
UEE50420	Diploma of Electrical Engineering
UEE50520	Diploma of Electronics and Communications Engineering

Code	Qualification Title
UEE50722	Diploma of Renewable Energy Engineering
UEE50920	Diploma of Industrial Electronics and Control Engineering
UEE51020	Diploma of Instrumentation and Control Engineering
UEE51120	Diploma of Engineering Technology - Refrigeration and Air Conditioning
UEE51220	Diploma of Air Conditioning and Refrigeration Engineering
UEE53020	Diploma of Electrical Systems Engineering
AQF 6	
UEE60220	Advanced Diploma of Electronics and Communications Engineering
UEE60620	Advanced Diploma of Industrial Electronics and Control Engineering
UEE60922	Advanced Diploma of Renewable Energy Engineering
UEE61222	Advanced Diploma of Engineering – Explosion protection
UEE61521	Advanced Diploma of Instrumentation and Control Engineering
UEE61720	Advanced Diploma of Engineering Technology – Electronics
UEE62022	Advanced Diploma of Engineering Technology - Renewable Energy
UEE62122	Advanced Diploma of Engineering Technology – Electrical
UEE62220	Advanced Diploma of Electrical - Engineering
UEE62320	Advanced Diploma of Electrical Engineering - Coal Mining
UEE62420	Advanced Diploma of Engineering Technology - Air Conditioning and Refrigeration
UEE62520	Advanced Diploma of Air Conditioning and Refrigeration Engineering
UEE63020	Advanced Diploma of Electrical Systems Engineering

ATTACHMENT B: UEE TRAINING PACKAGE SKILLS SETS

The following Skill Sets are in the UEE Electrotechnology Training Package:

Code	Title
UEESS00131	Data Communications - ACMA 'Open' Cabling Provider Skill Set
UEESS00132	Data Communications - ACMA 'Restricted' Telecommunications Cabling Registration Skill Set
UEESS00133	Restricted - Disconnection/Reconnection of Fixed Wired Low Voltage Electrical Equipment
UEESS00134	Data Communications - Install Aerial Communication Cables Skill Set
UEESS00135	Instrumentation - Programmable Control Systems Skill Set
UEESS00137	Data Communications - Install Below Ground Communication Cables Skill Set
UEESS00138	Data Communications – Test, Report and Rectify Faults in Data and Voice Installations Skill Set
UEESS00139	Data Communications - Restricted Telecommunications Cabler Registration - ACMA Skill Set
UEESS00140	Data Communications – Premises Cabling for NBN Rollout Skill Set
UEESS00141	Electrical - Providing Advice on Lighting Products Skill Set
UEESS00142	Data Communications – Plan an Integrated Cabling Installation System Skill Set
UEESS00143	Instrumentation - Develop an integrated system interface for access through a touch screen Skill Set
UEESS00144	Instrumentation - Develop Integrated Systems Skill Set
UEESS00145	Instrumentation - Plan the installation of integrated systems Skill Set
UEESS00146	RAC - Design Ammonia Refrigeration Systems Skill Set
UEESS00147	RAC- Design Complex Carbon Dioxide Refrigeration Systems Skill Set
UEESS00148	RAC - Design Hydrocarbon Refrigeration Systems Skill Set
UEESS00149	RAC - Design Secondary Refrigeration Systems Skill Set
UEESS00150	RAC - Install and Commission Ammonia Refrigeration Systems Skill Set
UEESS00151	RAC - Install and Commission Carbon Dioxide Refrigeration Systems Skill Set
UEESS00152	RAC - Install and Commission Hydrocarbon Refrigeration Systems and Associated Equipment Skill Set
UEESS00153	RAC - Operate Ammonia Refrigeration Plant Skill Set
UEESS00154	RAC - Service and Repair Ammonia Refrigeration Systems Skill Set

Code	Title
UEESS00155	RAC - Service and Repair Carbon Dioxide Refrigeration and Heat Pump Systems Skill Set
UEESS00156	RAC - Service and Repair Carbon Dioxide Refrigeration Systems Skill Set
UEESS00157	RAC - Service and Repair Flammable Refrigerant Refrigeration and Air Conditioning Systems Skill Set
UEESS00158	RAC - Service and Repair Secondary Refrigeration Systems Skill Set
UEESS00164	Sustainable - Energy Efficiency Auditor Skill Set
UEESS00169	Data Communications - Install and Modify Performance Data Communication Structured Cabling Skill Set
UEESS00170	Install and Modify Performance Data Communication Optical Fibre Cabling Skill Set
UEESS00171	Fire Detection and Alarm Systems - Installation, Maintenance, Commissioning and Servicing Skill Set
UEESS00172	Attachment of Cords and Plugs to Single Phase Low Voltage Electrical Equipment Skill Set
UEESS00173	Attachment of Cords/Cables and Plugs to Low Voltage Three Phase Electrical Equipment Skill Set
UEESS00174	Electrical Safety Testing of Electrical Cord Connected Equipment and Cord Assemblies Skill Set
UEESS00175	Apply Compliance Requirements to all Aspects of Electrical Work
UEESS00176	Apply Currency of Safe Working Practices and Compliance Verification of Electrical Installations
UEESS00177	Data Communications – Plan an Integrated Cabling Installation System - Electricians Skill Set
UEESS00178	Electrical - Develop and Implement Maintenance Programs Skill Set
UEESS00179	Electrical - Install and Set Up Interval Metering Skill Set
UEESS00180	Electrical - Plan, Manage and Report on Electrical Projects Skill Set
UEESS00181	Electrical – Inspect, Test and Maintain Emergency Lighting and Alarm Systems and Equipment
UEESS00182	Identify and Isolate Multiple Supply Systems
UEESS00183	RAC - Inspect, Test and Repair Fire and Smoke Control Features of Mechanical Services Systems

Code	Title
UEESS00184	RAC - Install, Commission, Service and Maintain Variable Refrigerant Flow Air Conditioning Systems
UEESS00187	Electrical - Install and Set Up Interval Metering Skill Set
UEESS00188	RAC - Inspect, Test and Repair Fire and Smoke Control Features of Mechanical Services Systems
UEESS00189	Rail Signalling Constructor Skill Set
UEESS00190	Electrical - Rail Signalling Principles Skill Set
UEESS00191	Grid-connected Battery Storage Systems Designer-Installer Skill Set
UEESS00192	Grid-connected Battery Storage Systems Installer Skill Set
UEESS00193	Grid-connected Photovoltaic and Battery Storage Systems Designer Skill Set
UEESS00194	Grid-connected Photovoltaic Systems Designer-Installer Skill Set
UEESS00195	Grid-connected Photovoltaic Systems Installer Skill Set
UEESS00196	Grid-connected Renewable Energy System Site Surveyor Skill Set
UEESS00197	Grid-connected Renewable Energy Systems Inspector Skill Set
UEESS00198	Hybrid Photovoltaic, Wind and Battery Storage Systems Installer Skill Set
UEESS00199	Micro-hydro Systems Designer Installer Skill Set
UEESS00200	Micro-hydro Systems Designer Skill Set
UEESS00201	Micro hydro systems Installer Skill Set
UEESS00202	Micro-grid Renewable Energy Systems Inspector Skill Set
UEESS00203	Micro-grid Systems Design Coordinator Skill Set
UEESS00204	Micro-grid Systems Installation and Maintenance Coordinator Skill Set
UEESS00205	Off-grid Photovoltaic/Generating Set Systems Designer-Installer Skill Set
UEESS00206	Off-grid Photovoltaic/Generating Set Systems Installer Skill Set
UEESS00207	Off-grid Photovoltaic Generating Set Systems Designer Skill Set

Code	Title
UEESS00208	Off-grid Renewable Energy System Site Surveyor Skill Set
UEESS00209	Off-grid Renewable Energy Systems Inspector Skill Set
UEESS00210	Sustainable - Electrical Installations Sustainability Strategies Skill Set
UEESS00211	Sustainable - Energy Assessment of Commercial Facilities Skill Set
UEESS00212	Sustainable - Energy Assessment of Industrial Properties and Enterprises Skill Set
UEESS00213	Sustainable - Energy Assessment of Residential, Office and Retail Premises Skill Set
UEESS00214	Sustainable - Energy Efficiency Systems Designer Skill Set
UEESS00215	Sustainable - Energy Efficiency Systems Developer Skill Set
UEESS00216	Sustainable - Identify Energy Efficiency Strategies Skill Set
UEESS00217	Wind Energy Systems Designer-Installer Skill Set
UEESS00218	Wind Energy Systems Designer Skill Set
UEESS00219	Wind Energy Systems Installer Skill Set

ATTACHMENT C: UEE TRAINING PACKAGE UNITS OF COMPETENCY

The Units of Competency in the UEE Electrotechnology Training Package are listed below.

The 4th and 5th alpha characters of unit codes indicate competency disciplines. These were updated when UEE11 transitioned to UEE. See ***Attachment F*** for the alpha coding conventions used for disciplines.

Code	Title
UEEAS0001	Assemble electronic components
UEEAS0002	Conduct quality and functional tests on assembled electronic apparatus
UEEAS0003	Modify electronic sub-assemblies
UEEAS0004	Select electronic components for assembly
UEEAS0005	Set up and check electronic component assembly machines
UEEAS0006	Use lead-free soldering techniques
UEEAS0007	Assemble, mount and connect control gear and switchgear
UEEAS0008	Fabricate and assemble bus bars
UEEAS0009	Mount and wire control panel equipment
UEECD0001	Analyse materials for suitability in electrical equipment
UEECD0002	Analyse static and dynamic parameters of electrical equipment
UEECD0003	Apply industry and community standards to engineering activities
UEECD0004	Apply material science to solving electrotechnology engineering problems
UEECD0005	Apply physics to solving electrotechnology engineering problems
UEECD0006	Apply technologies and concepts to energy sector work activities
UEECD0007	Apply work health and safety regulations, codes and practices in the workplace
UEECD0008	Carry out preparatory energy sector work activities
UEECD0009	Carry out routine work activities in an energy sector environment
UEECD0010	Compile and produce an energy sector detailed report
UEECD0011	Comply with scheduled and preventative maintenance program processes
UEECD0012	Contribute to risk management in electrotechnology systems
UEECD0013	Develop and implement energy sector maintenance programs
UEECD0014	Develop design briefs for electrotechnology projects
UEECD0015	Develop engineering solutions to photonic system problems
UEECD0016	Document and apply measures to control WHS risks associated with electrotechnology work

Code	Title
UEECD0017	Establish and follow a competency development plan in an electrotechnology engineering discipline
UEECD0018	Establish, maintain and evaluate energy sector WHS/OHS systems
UEECD0019	Fabricate, assemble and dismantle utilities industry components
UEECD0020	Fix and secure electrotechnology equipment
UEECD0021	Identify and select components, accessories and materials for energy sector work activities
UEECD0022	Identify building techniques, methods and materials used in energy sector work activities
UEECD0023	Identify effects of energy on machinery and materials in an energy sector environment
UEECD0024	Implement and monitor energy sector WHS policies and procedures
UEECD0025	Lay wiring/cabling and terminate accessories for extra-low voltage (ELV) circuits
UEECD0026	Manage risk in electrotechnology activities
UEECD0027	Participate in development and follow a personal competency development plan
UEECD0028	Plan an integrated cabling installation system
UEECD0029	Plan electrotechnology projects
UEECD0030	Prepare electrotechnology/utilities drawings using manual drafting and CAD equipment and software
UEECD0031	Prepare engineering drawings using manual drafting and CAD for electrotechnology applications
UEECD0032	Produce detailed electrotechnology/utilities drawings using CAD equipment and software
UEECD0033	Produce products for carrying out energy sector work activities
UEECD0034	Produce routine tools/devices for carrying out energy sector work activities
UEECD0035	Provide basic instruction in the use of electrotechnology apparatus
UEECD0036	Provide engineering solutions for problems in complex multiple path circuits
UEECD0037	Provide engineering solutions for uses of materials and thermodynamic effects
UEECD0038	Provide solutions and report on routine electrotechnology problems
UEECD0039	Provide solutions to basic engineering computational problems
UEECD0040	Solve basic problems electronic and digital equipment and circuits
UEECD0041	Solve electrotechnical engineering problems
UEECD0042	Solve problems in ELV single path circuits
UEECD0043	Solve problems in direct current circuits

Code	Title
UEECD0044	Solve problems in multiple path circuits
UEECD0045	Solve problems in multiple path extra-low voltage (ELV) a.c. circuits
UEECD0046	Solve problems in single path circuits
UEECD0047	Supervise and coordinate energy sector work activities
UEECD0048	Undertake computations in an energy sector environment
UEECD0049	Use advanced computational processes to provide solutions to energy sector engineering problems
UEECD0050	Use and maintain the integrity of a portable gas detection device
UEECD0051	Use drawings, diagrams, schedules, standards, codes and specifications
UEECD0052	Use routine equipment/plant/technologies in an energy sector environment
UEECD0053	Write specifications for computer systems engineering projects
UEECD0054	Write specifications for electronics and communications engineering projects
UEECD0055	Write specifications for industrial electronics and control projects
UEECD0056	Apply methods to maintain currency of industry developments
UEECD0057	Manage electrotechnology projects
UEECD0059	Write specifications for electrical engineering projects
UEECD0060	Write specifications for electrotechnology engineering projects
UEECD0061	Write specifications for refrigeration and air conditioning engineering projects
UEECD0062	Write specifications for renewable energy engineering projects
UEECD0063	Write work activity reports
UEECD0064	Interpret, produce and modify electrical drawings
UEECO0001	Estimate electrotechnology projects
UEECO0002	Maintain documentation
UEECO0003	Manage contract variations
UEECO0004	Participate in appliance servicing work and competency development activities
UEECO0005	Participate in business equipment work and competency development activities
UEECO0006	Participate in computer equipment work and competency development activities
UEECO0007	Participate in electronics and communications work and competency development activities
UEECO0008	Participate in fire protection control work and competency development activities
UEECO0009	Participate in instrumentation and control work and competency development activities

Code	Title
UEECO0010	Participate in refrigeration and air conditioning work and competency development activities
UEECO0011	Participate in security equipment work and competency development activities
UEECO0012	Participate in voice and data communications work and competency development activities
UEECO0013	Prepare specifications for the supply of materials and equipment for electrotechnology projects
UEECO0014	Prepare tender submissions for electrotechnology projects
UEECO0015	Provide quotations for installation or service jobs
UEECO0016	Receive and store materials and equipment for electrotechnology work
UEECO0017	Source and purchase material/parts for installation or service jobs
UEECO0018	Contribute to the commercialisation of products/applications/services
UEECO0019	Contribute to the conduct of a research project
UEECO0020	Contribute to the development of a product/application/service
UEECO0021	Contribute to the planning of a research project
UEECO0022	Participate in electrical machine repair work and competency development activities
UEECO0023	Participate in electrical work and competency development activities
UEECO0024	Participate in switchgear and control gear work and competency development activities
UEECO0025	Provide quotations for inspection and compliance audit services
UEECS0003	Assemble, set up and test computing devices
UEECS0018	Develop web pages for engineering applications
UEECS0020	Evaluate and modify object-oriented code programs
UEECS0022	Install and configure a client computer operating system and software
UEECS0028	Select, install, configure and test multimedia components
UEECS0029	Set up and configure basic local area network (LAN)
UEECS0030	Set up, configure and test biometric devices
UEECS0032	Support computer hardware and software for engineering applications
UEECS0033	Use engineering applications software on personal computers
UEEDV0001	Assemble and connect telecommunication frames and cabinets
UEEDV0002	Install aerial telecommunication cables
UEEDV0003	Install and connect cabling for direct access to telecommunications service

Code	Title
UEEDV0004	Install and connect data and voice communication equipment
UEEDV0005	Install and maintain cabling for multiple access to telecommunication services
UEEDV0006	Install and modify optical fibre performance data communication cabling
UEEDV0007	Install underground communication cables
UEEDV0008	Install, modify and verify coaxial and structured communication copper cabling
UEEDV0009	Select and arrange data and voice equipment for local area networks
UEEDV0010	Select and arrange equipment for wireless communication networks
UEEDV0011	Set up and configure basic data communication systems
UEEDV0012	Set up and configure the wireless capabilities of communications and data storage devices
UEEDV0013	Solve problems in voice and data communications circuits
UEEDV0014	Test, report and rectify faults in data and voice installations
UEEEC0001	Analyse the performance of wireless-based electronic communication systems
UEEEC0002	Assemble and install reception antennae and signal distribution equipment
UEEEC0003	Assemble and set up basic security systems
UEEEC0004	Assemble and set up fixed video/audio components and systems in buildings and premises
UEEEC0005	Assess electronic apparatus compliance
UEEEC0006	Carry out repairs of predictable faults in video and audio replay/recording apparatus
UEEEC0007	Commission electronics and communications systems
UEEEC0008	Commission large fire protection systems
UEEEC0009	Commission satellite and microwave communication systems
UEEEC0010	Design and develop advanced digital systems
UEEEC0011	Design and develop electronics/computer systems projects
UEEEC0012	Design custom electronic equipment installations
UEEEC0013	Design electronic printed circuit boards
UEEEC0014	Design signal-conditioning sub-systems
UEEEC0015	Develop basic plans for integrating security systems
UEEEC0016	Develop engineering solutions to RF amplifier problems
UEEEC0017	Develop engineering solutions to analogue electronic problems
UEEEC0018	Develop engineering solutions to audio electronic problems
UEEEC0019	Develop software solutions for microcontroller-based systems

Code	Title
UEEEC0020	Develop solutions for air surveillance apparatus and systems
UEEEC0021	Diagnose and rectify faults in air navigation circuits and systems
UEEEC0022	Diagnose and rectify faults in camera circuits and equipment
UEEEC0023	Diagnose and rectify faults in digital transmission circuits and systems
UEEEC0024	Diagnose and rectify faults in electronic display circuits
UEEEC0025	Diagnose and rectify faults in recording and replay equipment
UEEEC0026	Enter and verify programs for fire protection systems
UEEEC0027	Enter instructions and test wired and wireless security systems
UEEEC0028	Fault find and repair complex power supplies
UEEEC0029	Fault find and repair electronic apparatus
UEEEC0030	Fault find and repair electronic medical equipment
UEEEC0031	Fault find and repair global positioning systems
UEEEC0032	Fault find and repair high-volume office equipment
UEEEC0033	Fault find and repair navigation systems
UEEEC0034	Fault find and repair radar apparatus and systems
UEEEC0035	Fault find and repair satellite-based surveillance and observation systems
UEEEC0036	Fault find and repair sonar apparatus and systems
UEEEC0037	Fault find and repair telecommunication apparatus and systems
UEEEC0038	Find and repair microwave amplifier section faults in electronic apparatus
UEEEC0039	Install and test microwave antennae and waveguides
UEEEC0040	Install commercial video/audio system components
UEEEC0041	Install fire detection and warning system apparatus
UEEEC0042	Install large security systems
UEEEC0043	Manage computer systems/electronics projects
UEEEC0044	Modify - redesign electronics and communications systems
UEEEC0045	Modify digital signal processing (DSP) based sub-systems
UEEEC0046	Operate and maintain amateur radio communication stations
UEEEC0047	Plan large electronic projects
UEEEC0048	Program and commission commercial access control security systems
UEEEC0049	Program and commission commercial security closed-circuit television systems
UEEEC0050	Program and commission commercial security systems
UEEEC0051	Program and commission commercial video/audio systems

Code	Title
UEEEC0052	Program and test large security systems
UEEEC0053	Provide engineering solutions to air traffic control system problems
UEEEC0054	Provide gate array solutions for complex electronics systems
UEEEC0055	Repair basic computer equipment faults by replacement of modules/sub assemblies
UEEEC0056	Repair predictable faults in audio components
UEEEC0057	Repair predictable faults in general electronic apparatus
UEEEC0058	Repair predictable faults in television receivers
UEEEC0059	Repair routine business equipment faults
UEEEC0060	Repairs basic electronic apparatus faults by replacement of components
UEEEC0061	Set up and adjust commercial radio frequency (RF) transmission and reception systems
UEEEC0062	Set up and test residential video/audio equipment
UEEEC0063	Solve fundamental electronic communications system problems
UEEEC0064	Solve oscillator problems
UEEEC0065	Solve problems in basic electronic circuits
UEEEC0066	Troubleshoot amplifiers in an electronic apparatus
UEEEC0067	Troubleshoot basic amplifier circuits
UEEEC0068	Troubleshoot communication systems
UEEEC0069	Troubleshoot digital sub-systems
UEEEC0070	Troubleshoot faults in television receivers
UEEEC0071	Troubleshoot fire protection systems
UEEEC0072	Troubleshoot microcontroller-based hardware systems
UEEEC0073	Troubleshoot professional audio reproduction components
UEEEC0074	Troubleshoot resonance circuits in an electronic apparatus
UEEEC0075	Troubleshoot single phase input d.c power supplies
UEEEC0076	Verify compliance and functionality of fire protection system installations
UEEEC0077	Verify functionality and compliance of custom electronic installations
UEEEL0001	Apply compliance requirements to all aspects of electrical work
UEEEL0002	Apply currency of safe working practices and compliance verification of electrical installations
UEEEL0003	Arrange circuits, control and protection for electrical installations
UEEEL0004	Carry out basic repairs to electrical components and equipment

Code	Title
UEEEL0005	Develop and connect electrical control circuits
UEEEL0006	Develop detailed and complex drawings for electrical systems using CAD systems
UEEEL0007	Develop detailed electrical drawings
UEEEL0008	Evaluate and modify low voltage heating equipment and controls
UEEEL0009	Evaluate and modify low voltage lighting circuits, equipment and controls
UEEEL0010	Evaluate and modify low voltage socket outlets circuits
UEEEL0011	Evaluate performance of low voltage electrical apparatus
UEEEL0012	Install low voltage wiring, appliances, switchgear and associated accessories
UEEEL0014	Isolate, test and troubleshoot low voltage electrical circuits
UEEEL0015	Manage large electrical projects
UEEEL0016	Provide advice on effective and energy efficient lighting products
UEEEL0017	Repair and maintain mechanical components of electrical machines
UEEEL0018	Select wiring systems and select cables for low voltage electrical installations
UEEEL0019	Solve problems in direct current (d.c.) machines
UEEEL0020	Solve problems in low voltage a.c. circuitss
UEEEL0021	Solve problems in magnetic and electromagnetic devices
UEEEL0022	Supply effective and efficient lighting products for domestic and small commercial applications
UEEEL0023	Terminate cables, cords and accessories for low voltage circuits
UEEEL0024	Test and connect alternating current (a.c.) rotating machines
UEEEL0025	Test and connect transformers
UEEEL0026	Align and install traction lift equipment
UEEEL0027	Carry out low voltage electrical field testing and report findings
UEEEL0028	Conduct compliance and functional verification of electrical apparatus and existing circuits
UEEEL0029	Conduct compliance inspection of LV electrical installations with demand exceeding 100 A per phase
UEEEL0030	Conduct compliance inspection of single phase LV electrical installations
UEEEL0031	Conduct compliance inspection of special LV electrical installations
UEEEL0032	Conduct electrical tests on HV electrical machines
UEEEL0033	Conduct electrical tests on LV electrical machines
UEEEL0034	Conduct mechanical tests on electrical machines and components
UEEEL0035	Design effective and efficient lighting for public, open and sports areas

Code	Title
UEEEL0036	Design effective and efficient lighting for residential and commercial buildings
UEEEL0037	Design electrical installations with a low voltage demand greater than 400 A per phase
UEEEL0038	Design switchboards rated for high fault levels (greater than 400 A)
UEEEL0039	Design, install and verify compliance and functionality of general electrical installations
UEEEL0040	Develop compliance policies and plans to conduct an electrical contracting business
UEEEL0041	Develop engineering solution for synchronous machine and control problems
UEEEL0042	Develop engineering solutions for d.c. machine and control problems
UEEEL0043	Develop engineering solutions for induction machine and control problems
UEEEL0044	Diagnose and rectify faults in complex lift systems
UEEEL0045	Diagnose and rectify faults in traction lift systems
UEEEL0046	Find and repair faults in LV d.c. electrical apparatus and circuits
UEEEL0047	Identify, shut down and restart systems with alternate supplies
UEEEL0049	Install and maintain emergency safety systems
UEEEL0050	Install and replace low voltage current transformer metering
UEEEL0051	Investigate and report on electrical incidents and causes
UEEEL0052	Maintain and service traction lift systems and equipment
UEEEL0053	Maintain operation of electrical marine equipment and systems
UEEEL0054	Maintain operation of electrical mining equipment and systems
UEEEL0055	Overhaul and repair major switchgear and control gear
UEEEL0056	Place and connect electrical coils
UEEEL0057	Plan electrical installations with a low voltage demand up to 400 A per phase
UEEEL0058	Plan large electrical projects
UEEEL0059	Plan low voltage switchboard and control panel layouts
UEEEL0060	Prepare quotations for the supply of effective and efficient lighting products for lighting projects
UEEEL0061	Provide advice on the application of energy efficient lighting for ambient and aesthetic effect
UEEEL0062	Provide engineering solutions to problems in complex polyphase power circuits
UEEEL0063	Provide photometric data for illumination system design
UEEEL0064	Rewind HV three phase induction machines rated for voltages above 3.3 kV

Code	Title
UEEEL0065	Rewind HV three phase induction machines rated for voltages to 3.3 kV
UEEEL0066	Rewind LV direct current machines
UEEEL0067	Rewind single phase machines
UEEEL0068	Rewind three phase low voltage induction machines
UEEEL0069	Select and arrange equipment for special LV electrical installations
UEEEL0070	Select effective and efficient light sources and luminaries for given locations and designs
UEEEL0071	Select low voltage power factor correction equipment
UEEEL0072	Set up and place LV electrical apparatus and associated circuits into service
UEEEL0073	Verify compliance and functionality of special LV electrical installations
UEEEL0074	Wind electrical coils
UEEEL0075	Inspect, test and maintain emergency alarm systems and equipment
UEEEL0076	Inspect, test and maintain emergency lighting systems
UEEEL0077	Evaluate and report on performance of LV machines
UEEEL0078	Install and commission whole current electricity meters
UEEEL0079	Plan and analyse LV electrical apparatus and circuits
UEEEL0080	Design and analyse wiring systems, circuits, control and protection for electrical installations
UEEHA0002	Conduct visual and close inspection of electrical installations for hazardous areas
UEEHA0004	Enter a classified hazardous area to undertake work related to electrical equipment
UEEHA0008	Design gas detection systems
UEEHA0016	Assess the fitness-for-purpose of explosion-protected equipment
UEEHA0017	Classify areas where a combustible dust hazard may arise
UEEHA0018	Classify areas where flammable gas or vapour hazards may arise
UEEHA0019	Conduct a conformity assessment review of explosion-protected equipment
UEEHA0020	Conduct detailed inspection of electrical installations for hazardous areas
UEEHA0021	Design explosion-protected of electrical systems and installations
UEEHA0022	Determine the explosion-protection requirements to meet a specified classified hazardous area
UEEHA0023	Develop and manage periodic electrical inspection and maintenance programs for hazardous areas

Code	Title
UEEHA0024	Inspect, maintain and fit plugs/couplers for reeling, trailing and flexible cables - coal mining
UEEHA0025	Install explosion-protected equipment and associated apparatus and wiring systems
UEEHA0026	Maintain equipment associated with hazardous areas
UEEHA0027	Manage continuous supervision inspection of electrical installations for hazardous areas
UEEHA0028	Perform compliance audits of hazardous areas and related electrical installation
UEEHA0029	Plan electrical installations for hazardous areas
UEEHA0030	Repair reeling, trailing and flexible cables used in coal mining
UEEHA0031	Supervise repair and overhaul of explosion-protected equipment type flameproof (Ex d)
UEEHA0032	Supervise repair and overhaul of explosion-protected equipment type increased safety (Ex e)
UEEHA0033	Supervise repair and overhaul of explosion-protected equipment type intrinsically safe (Ex i)
UEEHA0034	Supervise repair and overhaul of explosion-protected equipment type pressurised (Ex p)
UEEHA0035	Supervise repair and overhaul of explosion-protected rotating machines
UEEHA0036	Test reeling, trailing and flexible cables and their attachments used in coal mining
UEEHA0037	Verify compliance of repaired reeling, trailing and flexible cables and attachments - coal mining
UEEHA0038	Conduct visual and close inspection of electrical installations for hazardous areas
UEEHA0039	Supervise repair and overhaul of explosion-protected equipment type Group III ('t')
UEEIC0001	Analyse complex electronic circuits controlling fluids
UEEIC0002	Assemble, enter and verify operating instructions in microprocessor equipped devices
UEEIC0003	Assist in commissioning process and instrumentation control systems
UEEIC0004	Calibrate, adjust and test measuring instruments
UEEIC0005	Configure and maintain industrial control system networks
UEEIC0006	Design and configure human-machine interface (HMI) networks
UEEIC0007	Design and use advanced programming tools, PC networks and HMI Interfacing
UEEIC0008	Design electronic control systems

Code	Title
UEEIC0009	Develop an electrical integrated system interface for access through a touch screen
UEEIC0010	Develop and test code for microcontroller devices
UEEIC0011	Develop electrical integrated systems
UEEIC0012	Develop structured programs to control external devices
UEEIC0013	Develop, enter and verify discrete control programs for programmable controllers
UEEIC0014	Develop, enter and verify programs in supervisory control and data acquisition systems
UEEIC0015	Develop, enter and verify word and analogue control programs for programmable logic controllers
UEEIC0016	Diagnose and rectify faults in a.c. motor drive systems
UEEIC0017	Diagnose and rectify faults in d.c. motor drive systems
UEEIC0018	Diagnose and rectify faults in digital controls systems
UEEIC0019	Diagnose and rectify faults in servo drive systems
UEEIC0020	Fault find and repair analogue circuits and components in electronic control systems
UEEIC0021	Find and rectify faults in process final control elements
UEEIC0022	Install instrumentation and control apparatus and associated equipment
UEEIC0023	Install instrumentation and control cabling and tubing
UEEIC0024	Plan the electrical installation of integrated systems
UEEIC0025	Provide solutions to extra-low voltage (ELV) electro-pneumatic control systems and drives
UEEIC0026	Provide solutions to fluid circuit operations
UEEIC0027	Provide solutions to pneumatic-hydraulic system operations
UEEIC0028	Provide solutions to problems in industrial control systems
UEEIC0029	Set up and adjust PID control loops
UEEIC0030	Set up and adjust advanced PID process control loops
UEEIC0031	Set up and configure human-machine interface (HMI) and industrial networks
UEEIC0032	Set up electronically controlled robotically operated complex systems
UEEIC0033	Set up gas analysis measuring and control instruments
UEEIC0034	Set up industrial field control devices
UEEIC0035	Set up scientific analysis measuring and control instruments
UEEIC0036	Set up water analysis measuring and control instruments

Code	Title
UEEIC0037	Set up weighting measuring and control instruments
UEEIC0038	Solve problems in density/level measurement components and systems
UEEIC0039	Solve problems in flow measurement components and systems
UEEIC0040	Solve problems in polyphase electronic power control circuits
UEEIC0041	Solve problems in pressure measurement components and systems
UEEIC0042	Solve problems in single phase electronic power control circuits
UEEIC0043	Solve problems in temperature measurement components and systems
UEEIC0044	Troubleshoot measuring and analysis systems
UEEIC0045	Troubleshoot medical equipment control systems
UEEIC0046	Troubleshoot process control systems
UEEIC0047	Use instrumentation drawings, specifications, standards and equipment manuals
UEEIC0048	Verify compliance and functionality of instrumentation and control installations
UEEIC0049	Manage instrumentation and control projects
UEEIC0050	Plan instrumentation and control projects
UEEIC0051	Evaluate motor drive systems and diagnose faults
UEERA0001	Analyse the operation of HVAC air and hydronic systems
UEERA0002	Analyse the psychrometric performance of HVAC/R systems
UEERA0003	Analyse the thermodynamic performance of HVAC/R systems
UEERA0004	Analyse vibration and noise in refrigeration and air conditioning systems
UEERA0005	Apply safety awareness and legal requirements for ammonia refrigerant
UEERA0006	Apply safety awareness and legal requirements for carbon dioxide refrigerant
UEERA0007	Apply safety awareness and legal requirements for flammable refrigerants
UEERA0008	Audit HVAC/R control systems for compliance with regulations and standards
UEERA0009	Audit energy use for commercial HVAC/R systems
UEERA0010	Commission complex heating, ventilation and air conditioning (HVAC) systems
UEERA0011	Commission complex refrigeration systems and equipment
UEERA0012	Commission complex refrigeration/air conditioning control systems
UEERA0013	Commission refrigeration/air conditioning hydronic systems
UEERA0014	Design ammonia refrigerated systems
UEERA0015	Design carbon dioxide refrigerated systems
UEERA0016	Design commercial refrigeration systems and select components
UEERA0017	Design complex air conditioning systems and select equipment

Code	Title
UEERA0018	Design complex commercial refrigeration systems and select equipment
UEERA0019	Design complex control systems for refrigeration or heating, ventilation, air conditioning systems
UEERA0020	Design complex industrial refrigeration systems and select equipment
UEERA0021	Design control systems for refrigeration or heating, ventilation and air conditioning systems
UEERA0022	Design heating, ventilation and air conditioning (HVAC) systems and select components
UEERA0023	Design hydrocarbon refrigerated systems
UEERA0024	Design hydronic systems and select equipment
UEERA0025	Design industrial refrigeration systems and select components
UEERA0026	Design mechanical ventilation/exhaust systems and select equipment
UEERA0027	Design secondary refrigerant systems
UEERA0028	Determine noise and vibration encountered in HVAC/R applications
UEERA0029	Develop heat exchanger design specifications
UEERA0030	Develop specifications and prepare drawings for HVAC/R projects
UEERA0031	Diagnose and rectify faults in air conditioning and refrigeration control systems
UEERA0032	Diagnose and rectify faults in complex air conditioning/refrigeration systems
UEERA0033	Diagnose faults in complex HVAC/refrigeration control systems
UEERA0034	Establish heat loads for commercial refrigeration and/or air conditioning applications
UEERA0035	Establish the basic operating conditions of air conditioning systems
UEERA0036	Establish the basic operating conditions of vapour compression systems
UEERA0037	Establish the basic operating conditions of vapour compression systems - appliances
UEERA0038	Establish the thermodynamic parameters of refrigeration and air conditioning systems
UEERA0039	Evaluate and report on building services energy management systems
UEERA0040	Evaluate and report on the indoor air quality of buildings
UEERA0041	Evaluate new and alternative technologies applicable to electrotechnology applications
UEERA0042	Evaluate thermodynamic and fluid parameters of refrigeration systems
UEERA0043	Find and rectify faults in appliance control systems and devices
UEERA0044	Find and rectify faults in single phase motors and associated controls

Code	Title
UEERA0045	Find and rectify faults in three phase motors and associated controls
UEERA0046	Install and commission ammonia refrigeration systems, components and associated equipment
UEERA0047	Install and commission carbon dioxide refrigeration systems, components and associated equipment
UEERA0048	Install and commission flammable refrigerant air conditioning and refrigeration systems
UEERA0049	Install and start up single head split air conditioning and water heating heat pump systems
UEERA0050	Install refrigerant pipe work, flow controls and accessories
UEERA0051	Install, commission, service and maintain air conditioning systems
UEERA0052	Install, commission, service and maintain low temperature systems
UEERA0053	Install, commission, service and maintain medium temperature systems
UEERA0054	Maintain microbial control of refrigeration and air conditioning systems
UEERA0055	Manage refrigeration and air conditioning projects
UEERA0056	Monitor and adjust refrigeration energy management systems
UEERA0057	Operate ammonia refrigeration plant
UEERA0058	Plan refrigeration and air conditioning projects
UEERA0059	Prepare and connect refrigerant tubing and fittings
UEERA0060	Produce HVAC/R control system diagrams
UEERA0061	Produce HVAC/R system design drawings
UEERA0062	Recover and charge refrigerants
UEERA0063	Recover, pressure test, evacuate, charge and leak test refrigerants - appliances
UEERA0064	Recover, pressure test, evacuate, charge and leak test refrigerants - split systems
UEERA0065	Repair and service ammonia refrigeration systems
UEERA0066	Repair and service carbon dioxide refrigeration systems
UEERA0067	Repair and service secondary refrigeration systems
UEERA0068	Repair and service self-contained carbon dioxide refrigeration and heat pump systems
UEERA0069	Resolve problems in beverage dispensers
UEERA0070	Resolve problems in central plant air conditioning systems
UEERA0071	Resolve problems in dairy refrigeration systems
UEERA0072	Resolve problems in hydronic systems

Code	Title
UEERA0073	Resolve problems in ice making systems
UEERA0074	Resolve problems in industrial refrigeration systems
UEERA0075	Resolve problems in post-mix refrigeration systems
UEERA0076	Resolve problems in refrigerated beverage vending cabinets
UEERA0077	Resolve problems in transport refrigeration systems
UEERA0078	Resolve problems in ultra-low temperature refrigeration systems
UEERA0079	Safely handle refrigerants and lubricants
UEERA0080	Select basic commercial refrigeration system equipment, components and accessories
UEERA0081	Select refrigerant piping, accessories and associated controls
UEERA0082	Select residential air conditioning system equipment, components and accessories
UEERA0083	Service and repair microwave ovens
UEERA0084	Service and repair self-contained flammable refrigerants air conditioning and refrigeration systems
UEERA0085	Service clothes washing machines and dryers
UEERA0086	Service dishwasher machines
UEERA0087	Service electrical heating appliances
UEERA0088	Service gas heating appliances
UEERA0089	Service refrigeration appliances
UEERA0090	Service room air conditioners
UEERA0091	Service small electrical appliances and power tools
UEERA0092	Solve problems in low voltage refrigeration and air conditioning circuits
UEERA0093	Verify functionality and compliance of appliances
UEERA0094	Verify functionality and compliance of refrigeration and air conditioning installations
UEERA0095	Recover refrigerant from stationary self-contained end of life decommissioned equipment
UEERA0097	Install, commission, service and maintain variable refrigerant flow air conditioning systems
UEERA0098	Inspect, test and repair fire and smoke control features of mechanical services systems
UEERE0001	Apply environmentally and sustainable procedures in the energy sector
UEERE0006	Conduct periodic maintenance of remote area power supply battery banks

Code	Title
UEERE0007	Conduct periodic maintenance of remote area power supply generator sets
UEERE0008	Conduct periodic maintenance of remote area power supply photovoltaic arrays
UEERE0009	Conduct periodic maintenance of remote area power supply wind generators
UEERE0013	Develop strategies to address environmental and sustainability issues in the energy sector
UEERE0015	Implement and monitor energy sector environmental and sustainable policies and procedures
UEERE0018	Maintain and repair remote area power generation facilities
UEERE0041	Maintain operation of remote area power generation plant
UEERE0049	Apply safe work practices in the rooftop solar industry
UEERE0050	Identify and isolate multiple supply systems
UEERE0051	Apply electrical principles to renewable energy design
UEERE0052	Assess energy loads and uses for energy efficiency in commercial facilities
UEERE0053	Assess energy loads and uses for energy efficiency in industrial properties and enterprises
UEERE0054	Conduct site survey for grid-connected photovoltaic and battery storage systems
UEERE0055	Conduct site survey for off-grid photovoltaic/generating set systems
UEERE0056	Coordinate maintenance of renewable energy (RE) apparatus and systems
UEERE0057	Coordinate the design of micro-grid renewable energy systems
UEERE0058	Coordinate the installation, fault finding and repair of micro grid systems
UEERE0059	Design energy management controls for electrical installations in buildings
UEERE0060	Design grid-connected battery storage systems
UEERE0061	Design grid-connected photovoltaic power supply systems
UEERE0062	Design micro-hydro systems
UEERE0063	Design off-grid photovoltaic/generating set systems
UEERE0064	Design renewable energy heating systems
UEERE0065	Design wind energy systems

UEERE0066	Develop effective engineering strategies for energy reduction in buildings
UEERE0067	Develop engineering solutions to renewable energy (RE) problems
UEERE0068	Develop strategies to address sustainability issues for electrical installations
UEERE0069	Diagnose and rectify faults in renewable energy (RE) control systems
UEERE0070	Fault find and repair grid-connected photovoltaic power supply systems
UEERE0071	Fault find and repair off-grid photovoltaic/generating set systems to an electrical installation
UEERE0072	Inspect grid connected renewable energy systems
UEERE0073	Inspect micro grid renewable energy systems
UEERE0074	Inspect off-grid renewable energy systems
UEERE0075	Install and maintain micro hydro energy systems to power conversion equipment
UEERE0076	Install and maintain wind energy systems to power conversion equipment
UEERE0077	Install battery storage equipment power conversion equipment to grid
UEERE0078	Install battery storage to power conversion equipment
UEERE0079	Install off-grid power conversion equipment to electrical installation
UEERE0080	Install photovoltaic power conversion equipment to grid
UEERE0081	Install photovoltaic systems to power conversion equipment
UEERE0082	Maintain renewable energy (RE) apparatus
UEERE0083	Maintain safety and tidiness of remote area power supply systems
UEERE0084	Manage renewable energy (RE) projects
UEERE0085	Plan renewable energy (RE) projects
UEERE0086	Promote sustainable energy practices
UEERE0087	Provide basic sustainable energy solutions for energy management in residential premises
UEERE0088	Work safely with remote area power supply systems
UEERL0001	Attach cords and plugs to electrical equipment for connection to a single phase 230 Volt supply
UEERL0002	Attach cords, cables and plugs to electrical equipment for connection to 1000 V a.c. or 1500 V d.c.

UEERL0003	Conduct in-service safety testing of electrical cord connected equipment and cord assemblies
UEERL0004	Disconnect - reconnect electrical equipment connected to low voltage (LV) installation wiring
UEERL0005	Locate and rectify faults in low voltage (LV) electrical equipment using set procedures
UEERL0006	Attach HV flexible cables and plugs
UEERL0007	Disconnect-reconnect 3.3 kV electric propulsion components of self-propelled earth moving vehicles
UEERL0008	Disconnect-reconnect explosion-protected appliances and control devices connected to LV installation
UEERS0020	Apply rail signalling principles
UEERS0021	Assemble and wire electrical rail signalling equipment
UEERS0022	Find and repair rail signalling system faults
UEERS0023	Inspect, test and certify rail power signal equipment
UEERS0024	Install and maintain rail track circuit leads and bonds
UEERS0025	Maintain active level crossing equipment
UEERS0026	Maintain communications based signalling equipment
UEERS0027	Maintain computer-based interlocking rail systems
UEERS0028	Maintain mechanical rail signalling equipment and infrastructure
UEERS0029	Maintain non-vital telemetry systems
UEERS0030	Maintain power-operated point actuating devices
UEERS0031	Maintain rail signalling power supplies
UEERS0032	Maintain trackside signal and train protection equipment
UEERS0033	Maintain train detection equipment
UEERS0034	Maintain vital relay interlocking systems
UEERS0035	Maintain wayside asset protection equipment
UEERS0036	Repair rail signalling power and control cables
UEERS0037	Test copper rail signalling cables

ATTACHMENT D: IMPORTED UNITS

The following imported Units of Competency are used in UEE Training Package qualifications and Skill Sets.

Code	Title
BSB Business Services Training Package	
BSBHRM413	Support the learning and development of teams and individuals
BSBINS402	Coordinate workplace information systems
BSBINS501	Implement information and knowledge management systems
BSBLDR413	Lead effective workplace relationships
BSBLDR414	Lead team effectiveness
BSBLDR522	Manage people performance
BSBOPS203	Deliver a service to customers
BSBOPS402	Coordinate business operational plans
BSBOPS404	Implement customer service strategies
BSBPEF402	Develop personal work priorities
BSBSTR401	Promote innovation in team environments
BSBSTR402	Implement continuous improvement
BSBSTR501	Establish innovative work environments
BSBSTR502	Facilitate continuous improvement
BSBTWK502	Manage team effectiveness
CPC Construction, Plumbing and Services Training Package	
CPCCWHS1001	Prepare to work safely in the construction industry
CPCWHS1001	Prepare to work safely in the construction industry
CPP Property Services Training Package	
CPPBDN6106	Produce building information modelling for building design projects
CPPFES2043	Apply regulations to prevent ozone depleting substance and synthetic greenhouse gas emissions
CPPFES2043A	Prevent ozone depleting substance and synthetic greenhouse gas emissions
CPPHES4005	Assess household energy use and efficiency improvements
HLT Health Training Package	
HLTAID009	Provide cardiopulmonary resuscitation
HLTAID011	Provide First Aid
ICT Information and Communications Technology	
ICTPRG302	Apply introductory programming techniques
ICTPRG430	Apply introductory object-oriented language skills
ICTPRG440	Apply introductory programming skills in different languages

Code	Title
ICTPRG443	Apply intermediate programming skills in different languages
ICTPRG444	Analyse software requirements
ICTPRG534	Deploy applications to production environments
ICTPRG549	Apply intermediate object-oriented language skills
ICTTEN203	Install and configure a home or small office network
ICTTEN204	Install and configure a small to medium business network
ICTTEN205	Build and maintain a secure network
ICTTEN312	Install telecommunications network equipment
ICTTEN409	Commission an electronic system
ICTTEN419	Implement and troubleshoot enterprise routers and switches
ICTTEN420	Design, install and configure an internetwork
ICTTEN421	Apply advanced routing protocols to network design
ICTTEN422	Configure and troubleshoot advanced network switching
ICTTEN423	Install and maintain a wide area network
ICTWEB447	Build basic website using development software and ICT tools
MEM Manufacturing and Engineering Training Package	
MEM16006	Organise and communicate information
MEM16008	Interact with computing technology
MEM234010A	Design microcontroller applications
MEM234014A	Design a robotic system
MEM30027A	Prepare basic programs for programmable logic controllers
MEM30031A	Operate computer-aided design (CAD) system to produce basic drawing elements
MEM30032A	Produce basic engineering drawings
MEM30033A	Use computer-aided design (CAD) to create and display 3-D models
MSS Sustainability Training Package	
MSS402003	Apply competitive systems and practices
MSS402022	Apply quick changeover procedures
MSS402023	Apply Just in Time procedures
MSS402042	Apply 5S procedures
MSS402084	Undertake root cause analysis
MSS402085	Contribute to the application of a proactive maintenance strategy
Chemical, Hydrocarbons and Refining Industry Training Package	
PMASUP410	Develop plant documentation
RII Resources and Infrastructure Industry Training Package	
RIIRAI609D	Establish and maintain electrical installations, reticulation and protection system

Code	Title
RIIRIS601D	Establish and maintain the risk management system
RIIWHS202E	Enter and work in confined spaces
RIIWHS204E	Work safely at heights
RIIWHS205E	Control traffic with stop-slow bat
TLI Transport and Logistics Training Package	
TLILIC0003	Licence to operate a forklift truck
TLIS2004	Install and maintain rail bonding systems
UEP Electricity Supply Industry – Generation Sector Training Package	
UEPOPS202	Apply quality systems to work
UEPOPS337	Maintain quality systems within the team
UEPOPS416	Monitor implementation of quality control for production and maintenance
UET Transmission, Distribution and Rail Sector Training Package	
UETDRIS017	Perform high voltage field switching operation to a given schedule
UETDRIS018	Perform low voltage field switching operation to a given schedule
UETDRIS025	Diagnose and resolve faults in distribution systems
UETDRIS026	Diagnose and resolve faults in electrical apparatus
UETDRIS027	Diagnose and resolve faults in transmission systems
UETDRIS031	Maintain insulating oil
UETDRIS032	Solve problems in network equipment
UETDRIS033	Solve problems in network protection
UETDRMP007	Perform rescue from a live low voltage panel
UETDRRF004	Perform rescue from a live LV panel
UETDRSB001	Perform substation switching operations to a given schedule
UETDRSB007	Install and maintain substation direct current systems
UETDRSB010	Maintain capacitor bank equipment

ATTACHMENT E: IMPLEMENTATION GUIDANCE

ELECTRICAL ASSESSMENT CONDITIONS

A small number of Electrical (UEEEL...) Units which cover critical EPCs used for issuing of an Electrical Licence include the following additional requirements in the Assessment Conditions:

> *In addition, evidence of Performance Evidence items of this unit marked with a hash (#) must be gathered in authentic workplace operational conditions (not simulated) before final determination of competence in this unit can be made.*

The purpose of these additional requirements is to ensure that evidence for the relevant performance items is gathered in authentic workplace settings and not limited to activities completed in institutional environments.

Where the above requirements are included, evidence must be gathered in authentic operational settings. During training plan development, consideration must be given to the candidate's ability, within the scope of their employment, to demonstrate Performance Evidence requirements on the job. This may require additional work placement/s outside of the apprentice's place of employment, where the employer's normal activities do not provide the scope of works required.

The use of evidence gathering techniques such as, but not limited to, workplace logbooks, journals and/or a profiling system will support implementation of these requirements.

The additional requirements appear in the following units:

- UEEEL0003 Arrange circuits, control and protection for electrical installations
- UEEEL0005 Develop and connect electrical control circuits
- UEEEL0008 Evaluate and modify low voltage heating equipment and controls
- UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and controls
- UEEEL0010 Evaluate and modify low voltage socket outlets circuits
- UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories
- UEEEL0014 Isolate, test and troubleshoot low voltage electrical circuits
- UEEEL0018 Select wiring systems and select cables for low voltage electrical installations
- UEEEL0023 Terminate cables, cords and accessories for low voltage circuits
- UEEEL0024 Test and connect alternating current (a.c.) rotating machines

RAIL SIGNALLING ENTRY AND LICENCING REQUIREMENTS

The Certificate IV in Rail signalling has two entry pathways. These pathways reflect the different Licencing requirements across jurisdictions.

Care must be taken to ensure jurisdictional licencing requirements are complied with by the pathway selected, and qualification certification documentation is correctly completed.

Students should be made aware that if the Electrical Fitter pathway is used this will limit which Australian States/Territories they can undertake rail signalling work in.

Qualification certification documentation (testamur) must indicate which pathway was used to ensure employers in jurisdictions where an unrestricted licence is required can easily identify appropriate candidates for employment.

Licencing requirements for different jurisdictions are as follows:

Jurisdiction	License requirement	Comments
ACT	NA	Railway Manager or Rail Signalling Contractor is based in New South Wales which sets the requirements.
NSW	Exemption in Place for Transport for NSW, Sydney Trains and Country Rail Network contractor	Very Large Sydney network and large country network. Large workforce of qualified signalling technicians for maintenance work and contractors for project work.
NT	Unrestricted Electrical License to work on Low Voltage	Many solar operated signalling systems (ELV) with limited LV systems. Very low level of railway network assets and of signalling equipment and low level of signalling maintenance staff.
QLD	Unrestricted Electrical License to work on Low Voltage	Broad statewide network with rail signalling staff handling the signalling equipment, signalling LV power supply and other LV power supply.
SA	Unrestricted Electrical License to work on Low Voltage	Adelaide network is small with dedicated signalling teams handling signalling equipment and signalling LV power. Country network has some LV equipment and significant solar equipment with no LV equipment.
Tas	Unrestricted Electrical License to work on Low Voltage	Very small network with only a few signalling staff.
Vic	Exemption in place for all rail & tramway signalling in Victoria	Large Melbourne network and large country network. Large workforce of qualified signalling technicians for maintenance work and contractors for project works.
WA	Electrical License to work on Low voltage Electrical Fitters License to work on Low voltage	Public Transport Authority WA only requires Electrical Fitting License Iron Ore railways primarily use ELV signalling with solar power supplies

INFORMATION REQUIRED ON CERTIFICATION DOCUMENTATION FOR LICENCING

Information about Qualification Pathways

In some jurisdictions a qualification may need to be completed in a certain way to achieve a licence, and qualifications may include a statement similar to the following to support this:

> *"Where required for Licencing, the certification documentation issued must indicate if the qualification was completed as an apprenticeship or Trades Recognition Australia (TRA) pathway"*

Information should be sought from the relevant Regulator prior to commencement to ensure candidates are not disadvantaged at completion of the qualification.

Please ensure certification documentation is compliant with the AQF Issuance Policy.

Information about Licence categories

To obtain and Electrical Occupation (Restricted) Licence in some jurisdictions and meet the electrical regulatory requirements for related restricted electrical work, additional information may be required on, or with, certification documentation.

Information should be sought from the relevant Regulator about what is required prior to commencement to ensure candidates are not disadvantaged at completion of the unit/s.

Please ensure certification documentation is compliant with the AQF Issuance Policy.

MAPPING OF DELETED UEE COMPUTER SYSTEMS UNITS TO ICT UNITS

In release 5.0 of the UEE Electrotechnology a number of Computer Systems (UEECS...) units of competency were deleted. They were deleted because it was identified that the workplace functions covered by them could be adequately covered by units of competency from the ICT Information and Communications Technology Training Package. Replacing these units improves transferability of skills.

Note: The deleted UEECS units listed below should not be selected as electives in qualifications they still appear. The Relevant ICT unit should instead be selected.

The following mapping of the UEE to ICT units was used to guide replacing the units in relevant UEE qualifications.

Deleted UEE units	Imported ICT/MEM units
UEECS0001 - Administer computer networks	ICTNWK307 Provide network systems administration
UEECS0002 - Analyse and implement biometric measuring techniques and applications	ICTPRG444 Analyse software requirements
UEECS0004 - Commission industrial computer systems	ICTTEN409 Commission an electronic system

Deleted UEE units	Imported ICT/MEM units
UEECS0005 - Design and implement advanced routing for internetworking systems	ICTNWK624 Configure advanced internetwork routing solutions
UEECS0006 - Design and implement multi-layer switching for internetworking systems	ICTNWK625 Plan and configure advanced internetwork switching solutions
UEECS0007 - Design and implement network systems for internetworking	ICTNWK625 Plan and configure advanced internetwork switching solutions
UEECS0008 - Design and implement remote access for internetworking systems	ICTTEN420 Design, install and configure an internetwork
UEECS0009 - Design and implement security for internetworking systems	ICTTEN420 Design, install and configure an internetwork
UEECS0010 - Design and implement wireless LANs/WANs for internetworking systems	ICTNWK561 Design enterprise wireless local area networks
UEECS0011 - Design and manage enterprise computer networks	ICTNWK424 Install and operate small enterprise branch networks
UEECS0012 - Design embedded controller control systems	MEM234010A Design microcontroller applications
UEECS0013 - Develop and validate biometric equipment/systems installation	ICTICT518 Research and review hardware technology options for organisations
UEECS0014 - Develop computer network services	ICTNWK426 Install and configure client-server applications and services
UEECS0015 - Develop energy sector computer network applications infrastructure	ICTNWK426 Install and configure client-server applications and services
UEECS0016 - Develop energy sector directory services	ICTNWK426 Install and configure client-server applications and services
UEECS0017 - Develop industrial control programs for microcomputer equipped devices	ICTPRG534 Deploy applications to production environments
UEECS0019 - Develop, implement and test object-oriented code	ICTPRG549 Apply intermediate object-oriented language skills
UEECS0021 - Install and administer UNIX/L+B17:B70INUX-based networked computers	ICTNWK309 Configure and administer network operating systems
UEECS0021 - Install and administer UNIX/LINUX-based networked computers	ICTNWK309 Configure and administer network operating systems
UEECS0023 - Install and configure network systems for internetworking	ICTTEN420 Design, install and configure an internetwork
UEECS0024 - Integrate multiple computer operating systems on a client server local area network	ICTNWK309 Configure and administer network operating systems
UEECS0025 - Modify/redesign industrial computer systems	ICTPRG534 Deploy applications to production environments
UEECS0027 - Provide programming solution for computer systems engineering problems	ICTPRG440 Apply introductory programming skills in different languages
UEECS0031 - Set up, create and implement content for a web server	ICTWEB447 Build basic website using development software and ICT tools

MEETING PRE-REQUISITE REQUIREMENTS

Imported units where UEE units are pre-requisites

At the time of publishing UEE Release 6.0 of the UEE Electrotechnology Training Package, there were a number of imported units which contained UEE11 units as pre-requisites which have been superseded/replaced. Because these units have been superseded/replaced they could not be packaged in the qualifications. Many of these will have direct mapping relationships, however some have been split and/or joined to create new units.

Training Providers will need to apply mapping/RPL/direct credit processes to ensure all pre-requisite requirements are met. The following table shows alignment of old to new units which have been split/joined. The relationship between the new/old units is not direct, and detailed mapping will need to be completed to ensure all requirements have been met.

UEE Unit	UEE11 Unit
UEECD0044 Solve problems in multiple path circuits	UEENEEE104A Solve problems in d.c. circuits
UEECD0046 Solve problems in single path circuits	
UEEEL0008 Evaluate and modify low voltage heating equipment and controls	UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits
UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and controls	
UEEEL0010 Evaluate and modify low voltage socket outlets circuits	
UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories	UEENEEG103 Install low voltage wiring and accessories
	UEENEEG104 Install appliances, switchgear and associated accessories for low voltage electrical installations
UEEEL0019 Solve problems in direct current (d.c.) machines	UEENEEG101A Solve problems in electromagnetic devices and related circuits
UEEEL0021 Solve problems in magnetic and electromagnetic devices	
UEEEL0024 Test and connect alternating current (a.c.) rotating machines	UEENEEG006A Solve problems in single and three phase low voltage machines
UEEEL0025 Test and connect transformers	

Meeting Pre-requisite requirements in UEE50320 Diploma of Electrical and Refrigeration and Air Conditioning

This qualification covers competencies which meet refrigeration, air conditioning (RAC) and electrical licencing. Not all the pre-requisites for the RAC Capstone unit UEERA0094 are packaged within the core units of the qualification. Some of the RAC units and Electrical units contain content which may be mapped to meet requirements. The following table provides indicative alignment of

content but is a guide only and should not be considered to indicate complete alignment. Training providers should complete their own mapping to ensure all requirements are met.

UEERA0094 Pre-requisite not in Core of UEE50320	Content Covered in other UEE50320 Core Units
UEECO0010 Participate in refrigeration and air conditioning work and competency development activities	UEECD0027 Participate in development and follow a personal competency development plan
UEECD0042 Solve problems in ELV single path circuits	UEECD0046 Solve problems in single path circuits
UEERE0001 Apply environmentally and sustainable procedures in the energy sector	UEERE0013 Develop strategies to address environmental and sustainability issues in the energy sector
UEERL0004 Disconnect - reconnect electrical equipment connected to low voltage (LV) installation wiring	UEEEL0010 Evaluate and modify low voltage socket outlets circuits UEEEL0014 Isolate, test and troubleshoot low voltage electrical circuits UEEEL0023 Terminate cables, cords and accessories for low voltage circuits UEEEL0047 Identify, shut down and restart systems with alternate supplies
UEERL0005 Locate and rectify faults in low voltage (LV) electrical equipment using set procedures	
UEERL0001 Attach cords and plugs to electrical equipment for connection to a single phase 230 Volt supply	
UEERL0002 Attach cords, cables and plugs to electrical equipment for connection to 1000 V a.c. or 1500 V d.c.	

Also, the following pre-requisite unit in UEEEL0039 Design, install and verify compliance and functionality of general electrical installations, is **not** in the core of UEE50320 Diploma of Electrical and Refrigeration and Air Conditioning qualification.

ELECTRONICS AND COMPUTERS

Product	Comment
UEEEC0068	This unit covers the skills and knowledge required to diagnose and repair radio communications equipment. It is designed to be delivered with UEEEC0061, which covers the setting up and adjustment of radio communications systems. The unit can be contextualised for either traditional analogue equipment (such as superheterodyne receivers, voltage-controlled oscillators, phase-locked loop frequency synthesisers) or for equipment using digital, software-defined architecture for the generation, amplification and filtering of radio frequency (RF) signals. In each case the relevant detail should be assessed for the equipment type in line with industry expectations.

Product	Comment
UEEEC0061	This unit covers the setting up and adjustment of radio communications systems. It is designed to be delivered with UEEEC0068, which covers the skills and knowledge required for diagnosis and repair of radio communications equipment.

AUSTRALIAN STANDARDS

Unit	Relevant Australian Standards
UEERA0096 Inspect, test and repair fire and smoke control features of mechanical services systems	AS1851 Routine servicing of fire protection systems and equipment AS1668 The use of ventilation and air-conditioning in buildings AS1670.1 Fire detection, warning, control and intercom systems - System design, installation and commissioning Fire Building Code of Australia
UEEEL0076 Inspect, test and maintain emergency lighting systems	AS/NZS 2293 Emergency lighting and exit signs for buildings series Building Code of Australia
UEEEL0075 Inspect, test and maintain emergency alarm systems and equipment	AS1670.1 Fire detection, warning, control and intercom systems - System design, installation and commissioning Fire AS 2220.1 Emergency warning and intercommunication systems in buildings Equipment design and manufacture AS1851 Routine servicing of fire protection systems and equipment Building Code of Australia

REFRIGERATION AND AIR CONDITIONING

Product	Comment
UEE42720 Certificate IV in Air Conditioning and Refrigeration Servicing	UEERA0094 - Those holding a UEE32211 Certificate III in Air-conditioning and Refrigeration trade qualification or equivalent meet the requirements of this unit and its prerequisite requirements.
UEE42820 Certificate IV in Air-conditioning Systems Energy Management and Control	UEERA0094 - Those holding a UEE32211 Certificate III in Air-conditioning and Refrigeration trade qualification or equivalent meet the requirements of this unit and its prerequisite requirements.

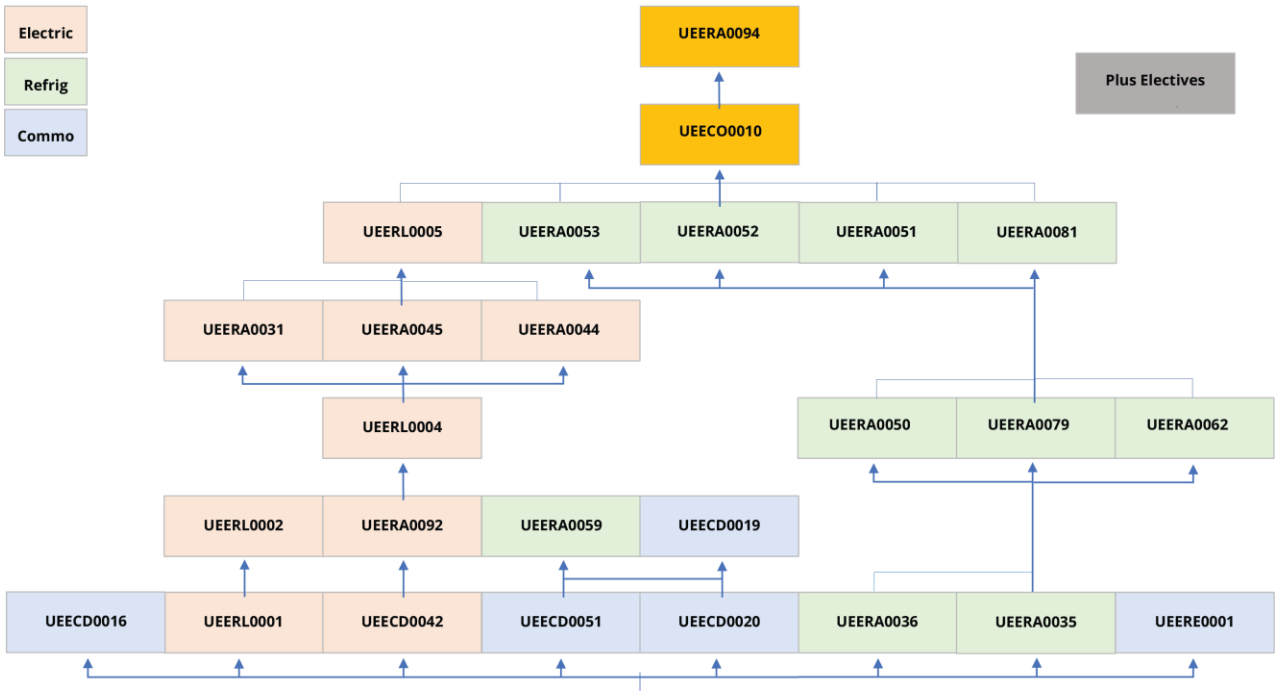
Product	Comment
UEE42920 Certificate IV in Refrigeration and Air Conditioning Systems	UEERA0094 - Those holding a UEE32211 Certificate III in Air-conditioning and Refrigeration trade qualification or equivalent meet the requirements of this unit and its prerequisite requirements.
UEE51220 Diploma of Air Conditioning and Refrigeration Engineering	UEERA0094 - Those holding a UEE32211 Certificate III in Air-conditioning and Refrigeration trade qualification or equivalent meet the requirements of this unit and its prerequisite requirements.
UEE62520 Advanced Diploma of Air Conditioning and Refrigeration Engineering	UEERA0094 - Those holding a UEE32211 Certificate III in Air-conditioning and Refrigeration trade qualification or equivalent meet the requirements of this unit and its prerequisite requirements.
UEERA0051 Install, commission, service and maintain air conditioning systems	Commissioning air conditioning systems requirements and procedures, including: • techniques to determine operating values for a reverse cycle high wall split air conditioning system operating with a 22°C zone temperature, 18 Kelvin (K) evaporator temperature difference (td), 25°C outside ambient and 15K condenser td.
UEERA0052 Install, commission, service and maintain low temperature systems	Commissioning typical general-purpose low temperature refrigeration systems requirements and procedures, including: • techniques to determine operating values of a low temperature system operating with a -20°C product temperature, 4Kelvin (K) evaporator temperature difference (td), 25°C outside ambient and 12K condenser td • techniques to determine operating values of a cycling and safety control settings for a low temperature system operating with a -20°C product temperature, 4K evaporator td, 25°C outside ambient and 12K condenser td.
UEERA0052 Install, commission, service and maintain low temperature systems	Note: Low temperature refrigerated cabinets and freezer rooms are those that typically operate with a saturated evaporating temperature below 0°C, a storage temperature below 0°C and employ a 'forced supplementary heat' defrost method.
UEERA0053 Install, commission, service	Commissioning typical general-purpose medium temperature refrigeration system requirements and procedures, including:

Product	Comment
and maintain medium temperature systems	• 25°C outside ambient and 15K (Kelvin) condenser temperature difference (td) for a basic off-cycle system • 25°C outside ambient and 15K condenser td for a system incorporating off-cycle pump down • temperature, 6K evaporator td, 25°C outside ambient and 15K condenser td.
UEERA0053 Install, commission, service and maintain medium temperature systems	Note: Medium temperature refrigerated cabinets and rooms are those that typically operate with a saturated evaporating temperature below 0°C, a storage temperature above 0°C and employ a natural or forced 'off-cycle' defrost method.
UEERA0065 Repair and service ammonia refrigeration systems	• Those who hold UEERA0005 and UEE32211 Certificate III in Air-conditioning and Refrigeration, or its equivalent meet the pre-requisite requirements of this unit. • Those who hold UEERA0079 and UEERA0053 meet the pre-requisite requirements of this unit.
UEERA0066 Repair and service carbon dioxide refrigeration systems	• Those who hold UEERA0006 and UEE32211 Certificate III in Air-conditioning and Refrigeration, or its equivalent meet the pre-requisite requirements of this unit. • Those who hold UEERA0079 and UEERA0053 meet the pre-requisite requirements of this unit.
UEERA0084 Service and repair self-contained flammable refrigerants air conditioning and refrigeration systems	• Those who hold UEERA0007 and UEE32211 Certificate III in Air-conditioning and Refrigeration, or its equivalent meet the pre-requisite requirements of this unit. • Those who hold UEERA0007 and UEE32111 Certificate III in Appliance Service, or its equivalent meet the pre-requisite requirements of this unit.
UEERA0098 Inspect, test and repair fire and smoke control features of mechanical services systems	Australian Standards relevant to this unit include: • AS1851 Routine servicing of fire protection systems and • equipment • AS1668 The use of ventilation and air-conditioning in buildings • AS1670.1 Fire detection, warning, control and intercom systems - System design, installation and commissioning Fire Documents may include: • cause matrix • building plan

Product	Comment

	• as installed drawings
	
	Fire and smoke control features of mechanical services may include:
	
	Mechanical services refers to equipment required to operate or switch off as an active part of a buildings fire and smoke hazard management system not limited to the following:
	• fire indicator panel
	• fire fan control panel
	• fire dampers
	• smoke dampers,
	• air dampers
	• smoke and heat vents
	• motorised relief openings
	• shutters
	• outdoor intakes
	• fire and smoke curtains
	• fire isolated exit pressurisation systems
	• fans including outside air and supply air
	• exhaust systems, including:
	  • kitchen exhaust systems
	  • smoke exhaust systems
	  • smoke reservoirs
	• any system or equipment that is required to shut down as part of the fire and smoke management system.

UEE32220 Certificate III in Air conditioning and Refrigeration – suggested delivery/assessment sequence for RTOs



RENEWABLE ENERGY

Product	Knowledge Evidence content advice	
UEERE0049 Apply safe work practices in the rooftop solar industry	Layout may include:	• Different levels of a rooftop • Physical design of the roof • Barriers • Chimneys • Skylights • Proximity to overhead lines
	working at heights requirements for the solar industry may include:	• Codes of practices • Regulatory requirements • Different types of equipment e.g edge protection • Different types of practices that should be considered • Working near skylights • Multistorey buildings • Working from scaffolding • Perimeter protection • Edge protection • Awareness of local jurisdiction requirements • Structural requirements
	Hazards may be physical and psychological including:	• Excessive noise • Working at heights • Vibration • Flying particles • Heat ad cold • UV radiation • Weather conditions • Chemicals • Burns • Dust • Electrical currents • Flora and fauna • Fatigue • Stress • Drugs and alcohol
UEERE0052 Assess energy loads and uses	Greenhouse gas emissions, ecological	• concept of greenhouse gas emissions and global warming

Product	Knowledge Evidence content advice	
for energy efficiency in commercial facilities	impacts and resource use may include:	• fossil fuel resource depletion and how mining impacts the environment • breakdown of energy consumption in the Australian commercial sector • breakdown of water consumption in the Australian commercial sector
	Energy efficiency methodologies may include:	• Energy services approach and relationship to energy auditing • End user focus and relationship to energy auditing • Opportunistic approach and relationship to energy auditing • Energy management strategy in relationship to energy efficiency, energy management, demand management, fuel switching and renewable energy • Financially viable best practice solutions; including net present value and internal rate of return • Water management strategy in relationship to water efficiency, water management, source switching and water reuse/recycling • Opportunistic best practice solutions in relationship to water and the differences to the financially viable best practice solutions • Benchmarking with reference to statistical benchmarks, technology benchmarks and best practice financially viable benchmark methodologies • Calculate best practice energy and water star ratings • Property cost and environmental impact tables in relationship to reporting energy audit outcomes • Sustainable initiative investment tables in relationship to reporting energy audit outcomes
	Energy auditing and practice may include:	• scope of Australian Standards for energy auditing

Product	Knowledge Evidence content advice	
		• Energy audit process in relationship to data collection, analysis and the communication of results • Accounts, bills and data, tariff structures and the identification of commercial tariff types • Calculate energy and energy balance including power calculations, usage time calculations, power factor calculations and energy conversions from kWh to MJ • process involved in onsite assessment in a commercial facilities energy audit. • gathering information on commercial facilities energy use and costs • Risks and hazards associated in a commercial facilities energy audit. • Calculate energy and power • Power rating of equipment and metering and measurement in a commercial facilities energy audit. • Calculate energy balance for commercial facilities • Advice on ways to improve energy efficiency • Calculate greenhouse emission, emissions factors, carbon intensity of electricity vs. natural gas and LPG and global warming potential and CO2 equivalents • Financial analysis in terms of simple payback and simple payback period and return on investment or rate of return • Reporting and communication of energy audit results • Energy audit system
	Energy management may include:	• energy management strategies. • practice based energy management. • technology based energy management. • interaction between human resources and practice based control. • application of technology based energy management.

Product	Knowledge Evidence content advice	
		• identify potential energy savings from application of energy management
	Power and energy data recording may include:	• Identify the structure and purpose of power and energy data recording for whole systems and equipment. • Review or develop single line schematic of electrical system of a commercial facility • Establish the power and energy data gap from the energy audit in T7 to achieve Australian Standard compliant energy audits. • Identify electrical loads that need contribute more than 5% of energy use • Understand and explain the operation seven different power and energy monitoring equipment available • Understand the implications of data recording intervals for monitoring equipment • Develop a power and energy monitoring strategy for a commercial facility • Deploy commercial facility power and energy monitoring strategy • Draw conclusions and report on power and energy data collection in a commercial facility
	Water supply, use, auditing services and design may include:	• collecting and analysis of information for commercial facilities water use and methods to improve water efficiency in the home • ability to analyse the water consumption index for different commercial sectors. • ability to analyse commercial facilities water use and ways to minimize the use of water. • understanding on the methodology applied to water savings • calculate water star rating Water flow rates of taps, showers and irrigation, toilets, washing machines, dishwashers and filtration and top up water use for cooling towers and pool systems • Commercial facility water meter reading

Product	Knowledge Evidence content advice	
		• Trends of water use and charges for commercial facilities • Water Efficiency Labelling (WELS) Scheme as it relates to water auditing • Identification of water efficiency opportunities in commercial facility assessments. • Operation of a rain water and grey water systems • Factors that impact on landscape water demand
	Lighting services and efficient design may include:	• Fundamental illumination design for commercial facilities • Illumination terms: light output, light level and brightness • Determining target light levels for differing tasks • Characteristics of light sources including efficacy, colour temperature and colour rendering index • Ballast types, their efficiency and benefits • Incandescent lamps, LED, Induction Lamps, halogen lighting, commercial fluorescent lighting, metal halide, mercury vapour and comparisons between these and applications for the commercial facilities • Application of lighting methodology for best practice energy efficiency design • Energy saving lighting opportunities in the commercial facilities
	Thermal performance and climate control may include:	• Thermal performance of a building impacts on heating, ventilation and air conditioning energy use including orientation, thermal mass, insulation, glazing, shading and ventilation • Air conditioning designs including central, ducted systems, split-system air conditioners, multi-headed split systems, individual room

Product	Knowledge Evidence content advice
	air conditioners (RAC), through wall / window and portable units • Improvement to air movement systems in commercial facilities including diffusers • Improvement to ventilation systems in commercial facilities • improvement of thermal performance of a commercial building envelop elements • ability to apply the knowledge of Australian climate zones • Air conditioning technologies including refrigerated type air conditioning, inverter type air conditioning, reverse cycle air conditioning, evaporative air conditioners, breeze power systems and digital scroll compressors • application of Energy Efficiency Ratio (EER) and Coefficient of Performance (COP) and show proficiency in EER and COP calculations • application of the Air Conditioning Star Ratings to commercial facilities • Gas and electric heating options and air (ducted) heating • operation of an air conditioning system and describe each components including the compressor, evaporator, condenser, expansion valve and fan coil • ceiling and pedestal fans and ventilation climate control • factors that impact on climate control energy consumption • best practice climate control methodology as applied to the commercial facilities • commercial facilities climate control saving opportunities • conducting thermal performance assessment of a commercial facilities

Product	Knowledge Evidence content advice	
	Food storage and preparation services and efficient design may include:	• refrigeration system basics operation • different refrigeration models • refrigeration characteristics including operation, automatic defrost, cooling temperature control, ice maker, ice and water dispenser, door seals and hinges • factors that impact on refrigerator energy use including size, configuration temperature setting, clearance around cabinet and ambient conditions, making ice, ice and water antisweat heaters, seals, insulation, compressor efficiency and age • Refrigerator and freezer star ratings • Cold room and freezer room energy saving opportunities • Food storage saving opportunities • different food preparation appliances • different operation of gas and electric hot plates and ovens and the advantages and disadvantages of each • EMI food preparation methodology • Food preparation saving opportunities • Food preparation services and efficient design

Product	Knowledge Evidence content advice	
	Water heating services and efficient design may include:	• different water heaters including electric and gas storage, gas instantaneous (continuous flow), electric heat pump and solar hot water heaters • solar water heater configurations and characteristics including passive (or thermo siphon) systems and active (or pumped) systems solar collector types, one shot booster • RECs and STCs and how these relate to solar water heater STCs • factors that influence water heater energy use including pipework and fitting insulation, atmospheric conditions, water efficiency, temperature setting and maintenance & operation • Water heating / cooling calculations • EMI water heating methodology • commercial water heating saving opportunities • types of entertainment and administration appliances found in commercial residences
	Entertainment and administration services and efficient design may include:	• appliance standby power including the different mode; passive and active standby • appliance energy star ratings • MEPS and labelling requirements for televisions • Network standby management strategies • Computers energy consumption including computer power management • Entertainment and administration saving opportunities

Product	Knowledge Evidence content advice	
	Cleaning services and efficient design may include:	• clothes washers types including vertical axis and horizontal axis • factors that impact on clothes washing energy use • energy and water MEPS star ratings and how they apply to clothes washers • Clothes dryer types including spin dryer, condenser dryers, gas dryers and heat pump dryers • Clothes dryer controls • Dishwasher types • vacuum cleaner types • EMI cleaning methodology • commercial cleaning saving opportunities
	Pumping systems (and pools) and efficient design may include:	• Pumping services in relation to commercial sector • Pumping types including centrifugal and positive displacement and pump selection and design • Pumping theory including pressure head, pressure pumping vs. transfer pumping, pump curves, pump best efficiency (operating) point bep, variable speed drive, energy balance for a typical pumping system and electric motors • operating of commercial pools in terms of pool pumps, pool backwashing, cartridge filters, pools turnovers, pool water use and pool heating • Energy efficiency pool systems design methodology • Energy efficiency hot water, chilled and condenser water pumping systems • Commercial pool systems saving opportunities
	Smart metering solutions may include:	• benefits of the different metering available to the commercial sector • metering opportunities relation to commercial sector

Product	Knowledge Evidence content advice	
	Renewable energy (solar PV/batteries) may include:	• design of solar PV systems and different panel types including mono-crystalline, poly-crystalline and amorphous • solar panel characteristics and choice of selection • solar power system utility approval process • Balance of systems, rules of thumb, shading, orientation and shading of strings in an on grid solar power system • Solar PV energy calculations and calculate REC entitlement for a small solar PV system • different feed-in tariff schemes and how they apply to solar PV
UEERE0053 Assess energy loads and uses for energy efficiency in industrial properties and enterprises	Greenhouse gas emissions, ecological impacts and resource use may include:	• concept of greenhouse gas emissions and global warming • fossil fuel resource depletion and how mining impacts the environment • breakdown of energy consumption in the Australian industrial sector • breakdown of water consumption in the Australian industrial sector
	Energy efficiency methodologies may include:	• Energy services approach and relationship to energy auditing • End user focus and relationship to energy auditing • Opportunistic approach and relationship to energy auditing • Energy management strategy in relationship to energy efficiency, energy management, demand management, fuel switching and renewable energy • Financially viable best practice solutions; including net present value and internal rate of return • Water management strategy in relationship to water efficiency, water management, source switching and water reuse/recycling

Product	Knowledge Evidence content advice	
		• Opportunistic best practice solutions in relationship to water and the differences to the financially viable best practice solutions • Benchmarking with reference to statistical benchmarks, technology benchmarks and best practice financially viable benchmark methodologies • Calculate best practice energy and water star ratings • Property cost and environmental impact tables in relationship to reporting energy audit outcomes • Sustainable initiative investment tables in relationship to reporting energy audit outcomes
	Energy auditing and practice may include:	• scope of Australian Standards for energy auditing • Energy audit process in relationship to data collection, analysis and the communication of results • Accounts, bills and data, tariff structures and the identification of industrial tariff types • Calculate energy and energy balance including power calculations, usage time calculations, power factor calculations and energy conversions from kWh to MJ • process involved in onsite assessment in an industrial facilities energy audit. • gathering information on industrial facilities energy use and costs • Risks and hazards associated in an industrial facilities energy audit. • Calculate energy and power • Power rating of equipment and metering and measurement in an industrial facilities energy audit. • Calculate energy balance for industrial facilities • Advice on ways to improve energy efficiency

Product	Knowledge Evidence content advice	
		• Calculate greenhouse emission, emissions factors, carbon intensity of electricity vs. natural gas and LPG and global warming potential and CO2 equivalents • Financial analysis in terms of simple payback and simple payback period and return on investment or rate of return • Reporting and communication of energy audit results • Energy audit system
	Energy management may include:	• energy management strategies. • practice based energy management. • technology based energy management. • interaction between human resources and practice based control. • application of technology based energy management. • identify potential energy savings from application of energy management
	Power and energy data monitoring and recording may include:	• Identify the structure and purpose of power and energy data recording for whole systems and equipment. • Review or develop single line schematic of electrical system of an industrial facility • Establish the power and energy data gap from the energy audit in T7 to achieve Australian Standard compliant energy audits. • Identify electrical loads that need contribute more than 5% of energy use • Understand and explain the operation seven different power and energy monitoring equipment available • Understand the implications of data recording intervals for monitoring equipment • Develop a power and energy monitoring strategy for a industrial facility • Deploy industrial facility power and energy monitoring strategy

Product	Knowledge Evidence content advice	
		• Draw conclusions and report on power and energy data collection in an industrial facility
	Water supply, use, auditing services and design may include:	• collecting and analysis of information for industrial facilities water use and methods to improve water efficiency in the home • ability to analyse the water consumption index for different industrial sectors. • ability to analyse industrial facilities water use and ways to minimize the use of water. • understanding on the methodology applied to water savings • calculate water star rating Water flow rates of taps, showers and irrigation, toilets, washing machines, dishwashers and filtration and top up water use for cooling towers and pool systems • industrial facility water meter reading • Trends of water use and charges for industrial facilities • Water Efficiency Labelling (WELS) Scheme as it relates to water auditing • Identification of water efficiency opportunities in industrial facility assessments. • Operation of a rain water and grey water systems • Factors that impact on landscape water demand
	Lighting services and efficient design may include:	• Fundamental illumination design for industrial facilities • Illumination terms: light output, light level and brightness • Determining target light levels for differing tasks • Characteristics of light sources including efficacy, colour temperature and colour rendering index • Ballast types, their efficiency and benefits

Product	Knowledge Evidence content advice	
		• Incandescent lamps, LED, Induction Lamps, halogen lighting, industrial fluorescent lighting, metal halide, mercury vapour and comparisons between these and applications for the industrial facilities • Application of lighting methodology for best practice energy efficiency design • Energy saving lighting opportunities in the industrial facilities
	Thermal performance and climate control may include:	• Thermal performance of a building impacts on heating, ventilation and air conditioning energy use including orientation, thermal mass, insulation, glazing, shading and ventilation • Air conditioning designs including central, ducted systems, split-system air conditioners, multi-headed split systems, individual room air conditioners (RAC), through wall / window and portable units • Improvement to air movement systems in industrial facilities including diffusers • Improvement to ventilation systems in industrial facilities • improvement of thermal performance of a industrial building envelop elements • ability to apply the knowledge of Australian climate zones • Air conditioning technologies including refrigerated type air conditioning, inverter type air conditioning, reverse cycle air conditioning, evaporative air conditioners, breeze power systems and digital scroll compressors • application of Energy Efficiency Ratio (EER) and Coefficient of Performance (COP) and show proficiency in EER and COP calculations • application of the Air Conditioning Star Ratings to industrial facilities • Gas and electric heating options and air (ducted) heating

Product	Knowledge Evidence content advice	
		• operation of an air conditioning system and describe each components including the compressor, evaporator, condenser, expansion valve and fan coil • ceiling and pedestal fans and ventilation climate control • factors that impact on climate control energy consumption • best practice climate control methodology as applied to the industrial facilities • industrial facilities climate control saving opportunities • conducting thermal performance assessment of a industrial facilities
	Food storage and preparation services and efficient design may include:	• refrigeration system basics operation • different refrigeration models • refrigeration characteristics including operation, automatic defrost, cooling temperature control, ice maker, ice and water dispenser, door seals and hinges • factors that impact on refrigerator energy use including size, configuration temperature setting, clearance around cabinet and ambient conditions, making ice, ice and water antisweat heaters, seals, insulation, compressor efficiency and age • Refrigerator and freezer star ratings • Cold room and freezer room energy saving opportunities • Food storage saving opportunities • different food preparation appliances • different operation of gas and electric hot plates and ovens and the advantages and disadvantages of each • EMI food preparation methodology • Food preparation saving opportunities • Food preparation services and efficient design

Product	Knowledge Evidence content advice	
	Water heating services and efficient design may include:	• different water heaters including electric and gas storage, gas instantaneous (continuous flow), electric heat pump and solar hot water heaters • solar water heater configurations and characteristics including passive (or thermo siphon) systems and active (or pumped) systems solar collector types, one shot booster • RECs and STCs and how these relate to solar water heater STCs • factors that influence water heater energy use including pipework and fitting insulation, atmospheric conditions, water efficiency, temperature setting and maintenance & operation • Water heating / cooling calculations • EMI water heating methodology • industrial water heating saving opportunities • types of entertainment and administration appliances found in industrial facilities
	Entertainment and administration services and efficient design may include:	• appliance standby power including the different mode; passive and active standby • appliance energy star ratings • MEPS and labelling requirements for televisions • Network standby management strategies • Computers energy consumption including computer power management • Entertainment and administration saving opportunities
	Cleaning services and efficient design may include:	• clothes washers types including vertical axis and horizontal axis • factors that impact on clothes washing energy use • energy and water MEPS star ratings and how they apply to clothes washers

Product	Knowledge Evidence content advice	
		• Clothes dryer types including spin dryer, condenser dryers, gas dryers and heat pump dryers • Clothes dryer controls • Dishwasher types • vacuum cleaner types • EMI cleaning methodology • industrial cleaning saving opportunities
	Pumping systems (and pools) and efficient design may include:	• Pumping services in relation to industrial sector • Pumping types including centrifugal and positive displacement and pump selection and design • Pumping theory including pressure head, pressure pumping vs. transfer pumping, pump curves, pump best efficiency (operating) point bep, variable speed drive, energy balance for a typical pumping system and electric motors • operating pools in terms of pool pumps, pool backwashing, cartridge filters, pools turnovers, pool water use and pool heating • Energy efficiency pool systems design methodology • Energy efficiency hot water, chilled and condenser water pumping systems • pool systems saving opportunities
	Smart metering solutions may include:	• benefits of the different metering available to the industrial sector • metering opportunities relation to industrial sector
	Renewable energy (solar PV) may include:	• design of solar PV systems and different panel types including mono-crystalline, poly-crystalline and amorphous • solar panel characteristics and choice of selection • solar power system utility approval process

Product	Knowledge Evidence content advice	
		• Balance of systems, rules of thumb, shading, orientation and shading of strings in an on grid solar power system • Solar PV energy calculations and calculate REC entitlement for a small solar PV system • different feed-in tariff schemes and how they apply to solar PV
UEERE0054 Conduct site survey for grid connected photovoltaic and battery storage systems	Site survey may include:	• sunshine hours irradiation, latitude, azimuth and altitude angles, radiance, tilt angle • energy efficiency initiatives relevant for domestic dwelling and commercial premises to reduce the electrical energy demand by the site owner • electricity network requirements and restrictions • government/utilities incentive schemes • assessing WHS/OHS risks when working on a particular site • solar access for the site • solar resource for the site • available area for the solar array • roof is suitable for mounting options for the array • shading and estimates of its effect on the system • switchboard or distribution board is located for connecting the output of power conversion equipment • array junction box (if required) and location of power conversion equipment • cabling route and estimates of the lengths of the cable runs • monitoring panels or screens and determining a suitable location with the site owner • existing electrical system • cultural heritage or environmental considerations • noise considerations

Product	Knowledge Evidence content advice	
		• access for customer • access for installation and maintenance personnel.
	Local, state and commonwealth requirements may include:	• codes • consumer protections (eg NETCC), ACCC • safety and technical elements.
	Information about existing electrical installation may include:	• existing RE installation elements • electrical safety elements • switchboards and electrical layouts - need to know c/b sizes, what connects to what (when there are sub boards and the like), overhead and underground wiring and other services • existing grid connection considerations • safety, protection, reticulation.
	Energy usage data may include:	• understanding of not only maximum loading but also diversity of site electrical operations - eg seasonal loads like shearing, significant events.
	Basic energy principles may include:	• definition of the terms: energy, power, energy efficiency, end-use energy, primary energy and embodied energy • system autonomy • calculation relating to energy, power and time • units and symbols for energy, power, time and temperature • conversion of energy and power quantities from one unit to another.

Product	Knowledge Evidence content advice	
UEERE0055 Conduct site survey for off-grid photovoltaic/generating set systems	Site survey may include:	• sunshine hours irradiation, latitude, azimuth and altitude angles, radiance, tilt angle • energy efficiency initiatives relevant for domestic dwelling and commercial premises to reduce the electrical energy demand by the site owner • electricity network requirements and restrictions • government/utilities incentive schemes • assessing WHS/OHS risks when working on a particular site • solar access for the site • solar resource for the site • available area for the solar array • roof is suitable for mounting options for the array • shading and estimates of its effect on the system • switchboard or distribution board is located for connecting the output of inverter • array junction box (if required) and location of inverter • cabling route and estimates of the lengths of the cable runs • monitoring panels or screens and determining a suitable location with the site owner • existing electrical system • cultural heritage or environmental considerations • noise considerations • access for fuel • access for customer • access for installation and maintenance personnel
	Information about working remotely can be found at:	https://www.comcare.gov.au/about/forms-publications/documents/publications/safety/remote-or-isolated-work-guide.pdf

Product	Knowledge Evidence content advice	
	Information about existing electrical installation may include:	• existing RE installation elements • electrical safety elements • switchboards and electrical layouts - need to know c/b sizes, what connects to what (when there are sub boards and the like), overhead and underground wiring and other services • existing grid connection considerations • safety, protection, reticulation
	Energy assessment may include:	• definition of terms energy, power, energy efficiency, end-use energy • calculations relating to energy, power and time • units and symbols for energy, power, time and temperature • conversion of energy and power quantities from one unit to another • identification of loads throughout site • working with customer to ensure loading information is considerate of all elements • identification of power and energy requirements of loads (cycling, typical operation, start up currents) • seasonality of periodicity of energy use • maximum demand and diversity of energy use
	Basic energy principles may include:	• definition of the terms: energy, power, energy efficiency, end-use energy, primary energy and embodied energy • system autonomy • calculation relating to energy, power and time • units and symbols for energy, power, time and temperature • conversion of energy and power quantities from one unit to another
	Solar resource may include:	• Sunshine hours, irradiation, latitude, azimuth and altitude angles, radiance, tilt

Product	Knowledge Evidence content advice	
		angle, likely Watts/m2, solar window, direct and diffuse radiation, solstice and equinox • Variation of solar radiation throughout the day and the year and impact on PV power output • Solar access for the site • Solar resource for the site • Tools for assessing solar resource and impacts of surrounding buildings/vegetation/other • Sources for solar radiation data
	PV Modules and Array may include:	• fundamentals of how PV modules operate (output proportional to light intensity, variable current, relatively non-variable voltage) • available area for PV array • roof suitability as mounting option • ground mounting options • shading effects • location with respect to other effects, dust, livestock, etc
	Wind resource may include:	• definition of terms: weather charts, isobars, fronts and troughs, clean wind • major global wind circulations and the formation of major wind flows over the continent • basic understanding of the variation of wind speed with height according to logarithmic and power laws and effects of surface roughness • effect of trees and structures on availability of clean wind and basic site requirements for a wind turbine • basic knowledge on types, construction and operating features of small wind turbines

Product	Knowledge Evidence content advice	
	Micro-hydro resource may include:	• Definition of the terms: potential and kinetic energy, micro-hydro system, gross head, frictional losses (head), net head and flow rate • Basic relationship between available water power and head and flow • Basic knowledge on construction and operating features of micro-hydro turbines
	Energy storage systems may include:	• Methods of energy storage • Fundamentals of energy storage – efficiency, cycling, safety, autonomy • Energy storage technologies • Life expectancy • Basic operation of energy storage systems • Installation considerations for energy storage systems – weight, volume, access and safety
	Balance of System components may include:	• Charge controllers, MPPTs, regulators • Inverters – grid forming/voltage source inverters and grid following/current source inverters; AC and DC coupled systems • Basic functions, operating principles and difference of the types of inverters • Marshalling boxes/combiner boxes • Housing for equipment • Data monitoring and system controllers
	Electrical infrastructure may include:	• Switchboard and distribution boards, locations and function; what connects to what • Switchboard layouts and space • Circuit breakers and isolation switches, sizing and allocation • RCD/RCBO protected circuits and any other electrical safety elements • General existing electrical system • Earthing stake location/s • Reticulation (overhead and underground)

Product	Knowledge Evidence content advice	
		• Any grid connection considerations, and electricity network requirements and restrictions • Existing renewable energy or generation infrastructure • Existing fuel storage; size, bunding, enclosure
	Site considerations may include:	• Cultural heritage • Environmental requirements • Identification of land ownership/operational aspects • Access to fuel • Access for customer • Access for installation and maintenance personnel • Noise considerations • Distances for voltage drop, cable runs • Customer expectations and their considerations in the survey report – including generator run time, days of autonomy for energy storage
	Local, state and commonwealth requirements may include:	• Codes • Consumer protections (NETCC, ACCC) • Safety and technical elements • Recognition of competency and where expect skills are required – structural, civil, Geotech, electrical, etc
UEERE0057 Coordinate the design of micro-grid renewable energy systems	relevant WHS/OHS requirements may include:	• risk assessment and mitigation processes • legislated requirements • roof access and working at heights • working in remote areas • development and implementation of safety management plans.
	relevant standards, building regulations and codes of practice may include:	• energy assessment and monitoring • interoperability standards • fire and safety • storage and safety of fuel.

Product	Knowledge Evidence content advice	
	stakeholders involved in the design, installation and maintenance of energy systems and their roles may include:	• distribution network providers • users of the micro-grid • entities (e.g. mine, council, consortium) • power retailers • land owners.
	site surveying may include:	• sunshine hours irradiation, latitude, azimuth and altitude angles, radiance, tilt angle • energy efficiency initiatives relevant for domestic dwelling and commercial premises to reduce the electrical energy demand by the site owner • electricity network requirements and restrictions • government/utilities incentive schemes • assessing WHS/OHS risks when working on a particular site • solar access for the site • solar resource for the site • available area for the solar array • roof is suitable for mounting options for the array • shading and estimates of its effect on the system • switchboard or distribution board is located for connecting the output of inverter • array junction box (if required) and location of inverter • cabling route and estimates of the lengths of the cable runs • monitoring panels or screens and determining a suitable location with the site owner • existing electrical system.

Product	Knowledge Evidence content advice	
	energy assessment and monitoring may include:	• methods for discussing with clients • methods for collecting energy usage and patterns • energy efficiency • data sources • data logging • meter analysis • site plans, satellite images, distances between structures and infrastructure • information to support development of fire safety plan.
	micro-grid energy generating systems may include:	• different equipment types and their componentry • distribution configurations • factors that impact equipment type selection • design, installation, and maintenance requirements • environmental considerations and required approvals • considerations when multiple sources are used • mix of renewable and other energy generating systems • smart systems including monitoring and control • generator controls • running multiple systems • smart PLC/SCADA smart processors • data networking • protection systems • cable selection • private metering • fuel systems • fire and safety • bushfire resilience • grid stability.

Product	Knowledge Evidence content advice	
	micro-grid energy storage systems may include:	• different equipment types and their componentry • factors that impact equipment type selection • design, installation, and maintenance requirements.
	jurisdictional approvals required before installation may include:	• relevant regulation and responsibilities • environmental • heritage • safety • fire • local guidelines.
UEERE0060 Design grid-connected battery storage systems	System performance may include:	• return on investment
	Network / aggregator provider requirements	• May differ between providers • virtual power plants

	Typical configurations of battery storage systems for grid-connected PV systems may include:	• multimode inverter/s for connecting to renewable energy, grid, loads and battery storage; this inverter/s provide backup to dedicated loads on grid failure and may:
		  • have a built in charge controller for direct connection of a PV array or
		  • require a separate charge controller to direct current (DC) couple the PV array and battery
		• two types of inverters comprising, photovoltaic grid-connected inverters and multimode inverters where:
		  • both inverter types are connected to the grid and loads via a switching device that provides backup to dedicated loads during grid failure
		  • both inverter types are connected to the grid and only the multimode inverter/s

Product	Knowledge Evidence content advice	
		provide backup to dedicated loads on grid failure • only the multimode inverter/s are connected to the grid; the grid-connected inverter/s are alternating current (AC) coupled to the multimode inverter/s and both types can provide backup to dedicated loads on grid failure
	Energy management strategies may include:	• energy source switching options to reduce the maximum and surge demand, based on load profile analysis • heat pumps • tariff optimisation
UEERE0064 Design renewable energy (RE) heating systems	combustion and fuels may include:	• air/fuel ration - stoichiometric excess or insufficient air • emissions and pollutants and their control • combustion equations - element mass balance • combustion products - gravimetric basis •
	steam may include:	• temperature-specific enthalpy diagram for steam/water • use of steam table to determine steam/water properties (any condition except supercritical) • steam generation - water tube and fire tube boilers, and boiler efficiency • safety devices and controls used with boilers • steam plant - steam traps, economiser, air, pre-heater, superheater, air/water separators, water treatment, feedwater pump and exhaust gas treatment • heat transfer rates to or from steam/water (any condition except supercritical) • steam throttling and formation of flash steam • steam heat exchangers and barrel calorimeters

Product	Knowledge Evidence content advice	
		• steam plant for process heating • steam plant for power production
	refrigeration/heat pump may include:	• refrigerant properties using the pH diagram • ideal vapour compression cycle on the pH diagram • energy balance and heat transfers in compressor, evaporator and condenser • actual vapour compression cycle and variations from the ideal - pressure loss in lines and non-ideal compression • superheating and sub-cooling with or without suction/liquid heat exchanger • Carnot principle applied to refrigerator and heat pump principles of evaporative refrigeration, absorption refrigeration, air cycle refrigeration and thermo-electric refrigeration
	energy balance may include:	• energy balance and instantaneous efficiency equations for a collector • calculation of the collector constants from the instantaneous collector efficiency equation for a linear relationship
	solar collector performance may include:	• scope and content of relevant sections of Industry Standards • method for testing the thermal performance of a solar collector or a solar water heater according to Industry Standards • efficiency curves for various types of solar collectors • performance of various types of solar water heaters in terms of their design, location and predicted solar fraction

Product	Knowledge Evidence content advice	
	hydraulic circuits may include:	• configuration of a hydraulic circuit for a pumped storage solar water heating system • suitable water and energy conservation measures, including user education, water conservation technologies and insulation
UEERE0066 Develop effective engineering strategies for energy reduction in buildings	climate and thermal comfort may include:	• characteristics of the different Australian climatic types • use of climatic data in published and electronic forms to extract the quantities relevant to energy efficient design • relationship between climate and comfort using bioclimatic or psychrometric charts • calculation of heating or cooling degree days or degree hours for various locations • calculation of thermal neutrality for a given location
	solar geometry and radiation may include:	• definition of the terms: declination, hour angle, zenith angle, azimuth and altitude angles, and the equation of time • conversion of solar time to local time and vice versa • position of the sun and the length of shadows with the aid of algorithms, tables, sun charts or computer software • daily irradiation incident on a wall, window or roof of a given tilt and orientation • relative summer and winter irradiation of windows facing the cardinal orientations • building facades and surrounding thermal mass • orientation and proximity to other buildings
	heat transfer may include:	• thermal processes of conduction, convection and radiation apply to the transfer of heat in buildings

Product	Knowledge Evidence content advice	
		• calculation of the summer and winter U-values of building elements using tables and software • calculation of the infiltration heat transfer in a building
	glazing systems may include:	• different types of glazing systems and their characteristics • different types of shading devices and the window orientations for which they are most appropriate • solar heat gain for different glazing types and angles of incidence • calculation of the average daily irradiation of a window partly shaded by eaves, using computer software • calculation of the average daily heat gain through a window partly shaded by eaves
	insulation may include:	• different types of insulation and where they are used • how different types of insulation are installed in roofs, walls and floors • determination of the minimum R-values of roof insulation for different locations using Australian Standard AS 2627 Thermal insulation of dwellings or similar standards
	thermal mass may include:	• advantages and disadvantages of using substantial thermal mass in different climate types and for different heating and cooling regimes • where thermal mass can be located in a building • definition of the following terms: time lag, decrement factor, admittance and response factor

Product	Knowledge Evidence content advice	
	comfort control strategies may include:	• interpretation of the usefulness of a design strategy with the aid of a psychrometric chart showing control potential zones for a particular location • selection of the most useful comfort control strategies for Australian climatic regions
	energy efficiency in buildings may include:	• determination of the direction of the following: both true and magnetic, north winter and summer sunrise, winter and summer sunset • solar access in summer and winter to various possible house locations on a site and room locations within the house • how vegetation can be used to both funnel and deflect wind • using cross ventilation as a cooling strategy
	thermal performance of a building may include:	• heating requirements of a building using the heating degree day or hour method
	dynamic performance predicted by a computer simulation programs may include:	• active solar system types available which can provide hot water, space heating and cooling • the best location on the roof, and the optimum tilt and orientation of the collector panels • function of the main components of an air or water-based solar space heating system • schematic of the fluid circuit of an air or water-based space heating system • main solar cooling system types

Product	Knowledge Evidence content advice	
	energy rating schemes may include:	• differences in approach used by house energy rating schemes in Australia • energy performance of a number of houses using a computer simulation program such as NatHERS or BERS • other methods to reduce energy consumption within and outside a building, including appliance efficiency, human behaviour changes, building management strategies and transportation minimisation • additional cost of energy efficiency measures and cost savings using life cycle cost or simple pay back methods according to AS 3595 and AS/NZS 4536 Life cycle costing
	sustainable and safe building materials may include:	• common building materials and their embodied energy content • environmental impact of the production of various building materials • problems associated with the use or disposal of building materials
UEERE0067 Develop engineering solutions to renewable energy (RE) problems	energy resources may include:	• energy transfer in closed and open systems • alternative energy sources • existing and emerging technologies and applications • structure of the existing generation, • distributed generation technologies • electrical power distribution systems operation • RE supplies issues • factors affecting the uptake of distributed generation • grid connected and micro-grid systems • distributed energy implementation

Product	Knowledge Evidence content advice	
	energy and humanity including:	• need for energy and relationship between energy usage and standard of living • energy conversion - typical processes and efficiencies • sources of energy • solar energy - direct heating, photosynthesis, solar cells, power tower, hydrogen for solar energy, ocean thermal energy collector, solar ponds, wind and wave energy, and hydro-electric power • geothermal energy • tidal energy • nuclear energy - fission and fusion, burner and breeder reactors • stored fuel reserves • fuel conservation - reduction in wastage, recycling, greater usage efficiency and use of waste heat • thermodynamics
	basic concepts including:	• nature of matter - atoms, molecules, inter-molecular forces, molecular motion and states of matter • mass and conservation of mass principle • volume, density, specific volume and relative density • force, weight and pressure (atmospheric, gauge and absolute) • temperature (Celsius and Kelvin) • systems and black box analysis • reciprocating piston and cylinder mechanism – pressure ratio and compression ratio

Product	Knowledge Evidence content advice	
	energy including:	• definition and principles • potential energy • kinetic energy • work (linear and rotational), constant and variable force, relationship to pressure and volume change • power (linear and rotational) • sensible heat - specific heat capacity (constant pressure and constant volume) • latent heat • chemical energy - energy content of a fuel • internal energy • energy storage
	electrical application technologies may include:	• control systems • power electronics enablement • smart devices • static var compensator (SVR) • stat comm • transformers • internet of things • transmission and distribution systems • protection and relaying • superconducting • synchronisation • power quality
	energy transfer in closed and open systems including:	• definition of a closed system • calorimetry as an example of a closed system (with or without phase change) • thermodynamics 1 • non-flow energy equation - typical applications such as stirring with simultaneous heating or cooling • definition of an open system • mass and volume flow rate and continuity equation • steady flow energy equation (negligible change in kinetic or potential energy) leading to the concept of enthalpy - typical

Product	Knowledge Evidence content advice	
		applications such as turbines, compressors, boilers and heat exchangers
	gases including:	• definition of a perfect or ideal gas in terms of the molecular model • general gas equation • characteristic gas equation (equation of state) • constant pressure process • constant volume process • isothermal process • polytropic process • adiabatic process
	heat engines including:	• definition of a heat engine • essentials of a heat engine - heat source, heat sink, working substance, mechanical power output and working cycle • energy balance for a heat engine (as a black box) and efficiency • maximum possible efficiency (Carnot efficiency) • types of heat engines according to working substance, heat source, mechanical arrangement and working cycle • typical practical cycles - Stirling, Otto, diesel, dual, two-stroke (spark and compression ignition) and Joule cycle • thermodynamics
	heat engine performance including:	• measurement of torque and power output - rope brake, shoe brake, hydraulic dynamometer and electric dynamometer • heat supply rate, efficiency and specific fuel consumption • measurement of indicated power - mechanical indicator, electric/electronic indicator and Morse test • friction power, mechanical efficiency and indicated thermal efficiency • volumetric efficiency • energy balance

Product	Knowledge Evidence content advice	
		• performance curves - variable load constant speed, and variable speed constant throttle setting
	electrical power distribution systems operation including:	• electrical characteristics of feeders • causes of voltage problems in a power distribution system • voltage regulation limits • calculations for feeder voltage drops • methods of voltage control • fault types, causes and effects • determination of fault levels • fault level limitation
	protection and relaying including:	• protection system purpose and features • application of protection in a distribution network • protection system terminology • feeder protection systems
	distributed generation issues including:	• utility requirements for interconnection • safety of personnel • islanding • grid stability • voltage regulation • potential benefits of distributed generation • limitations in design of distribution circuits (designed for one-way operation) • match between supply and demand • operation: dispatchable and non-dispatchable supplies • factors affecting the sizing of distributed generation • use of energy storage • case studies
	RE supply issues including:	• limits to penetration • factors affecting the value of renewables on the grid • implications of renewable input on power system operation

Product	Knowledge Evidence content advice	
		• connection of energy systems via inverters: AS 4777 Grid connection of energy systems via inverters
	factors affecting the uptake of distributed generation including:	• institutional factors • regulatory factors • policy including mandated targets • green power market • financial issues • contractual issues • case studies
UEERE0070 Fault find and repair grid-connected photovoltaic power supply systems	daily irradiation may include:	• definition of the terms: sunshine hours, latitude, direct and diffuse radiation, azimuth and altitude angles, radiance, solar window, tilt angle, • interpretation of solar radiation data tables • how radiation varies throughout the year on the surface of a fixed collector • factors affecting the optimal tilt and orientation of PV arrays.
	PV modules may include:	• definition of the terms: cell, module, array, mono-crystalline, poly-crystalline, amorphous • basic physical principles of PV cell operation for the main types of commercially available PV modules • mechanical and electrical features necessary for the long life of a PV module under a wide range of operating conditions.
UEERE0072 Inspect grid connected renewable energy systems	installation of photovoltaic systems to power conversion equipment should include knowledge to the level of:	UEERE0081 Install photovoltaic systems to power conversion equipment

Product	Knowledge Evidence content advice	
	installation of battery storage equipment power conversion equipment to grid should include knowledge to the level of:	UEERE0077 Install battery storage equipment power conversion equipment to grid
	installation of battery storage to power conversion equipment should include knowledge to the level of:	UEERE0078 Install battery storage to power conversion equipment
	installation of photovoltaic power conversion equipment to grid should include knowledge to the level of:	UEERE0080 Install photovoltaic power conversion equipment to grid
	fault finding and repair of grid-connected photovoltaic power supply systems should include knowledge to the level of:	UEERE0070 Fault find and repair grid-connected photovoltaic power supply systems
UEERE0073 Inspect micro grid renewable energy systems	Installation, fault finding and repair of micro grid systems should include knowledge to the level of:	UEERE0056 Coordinate the installation, fault finding and repair of micro grid systems

Product	Knowledge Evidence content advice	
UEERE0074 Inspect off-grid renewable energy systems	Installation of photovoltaic systems to power conversion equipment should include knowledge to the level of:	UEERE0081 Install photovoltaic systems to power conversion equipment
	Installation of battery storage to power conversion equipment should include knowledge to the level of:	UEERE0078 Install battery storage to power conversion equipment
	Installation and maintenance of wind energy systems to power conversion equipment should include knowledge to the level of:	UEERE0076 Install and maintain wind energy systems to power conversion equipment
	Installation and maintenance of micro hydro energy systems to power conversion equipment should include knowledge to the level of:	UEERE0075 Install and maintain micro hydro energy systems to power conversion equipment
	Installation of off-grid power conversion equipment to electrical installation should include knowledge to the level of:	UEERE0079 Install off-grid power conversion equipment to electrical installation

Product	Knowledge Evidence content advice	
	Fault finding and repair off-grid photovoltaic/generating set systems to an electrical installation should include knowledge to the level of:	UEERE0071 Fault find and repair off-grid photovoltaic/generating set systems to an electrical installation

UEERE0077 Install battery storage equipment power conversion equipment to grid	System performance may include:
	
	Typical configurations of battery storage systems for grid-connected PV systems may include:
		• return on investment
		• virtual power plants
		
		• multimode inverter/s for connecting to renewable energy, grid, loads and battery storage; this inverter/s provide backup to dedicated loads on grid failure and may:
		  • have a built in charge controller for direct connection of a PV array or
		  • require a separate charge controller to direct current (DC) couple the PV array and battery
		• two types of inverters comprising, photovoltaic grid-connected inverters and multimode inverters where:
		  • both inverter types are connected to the grid and loads via a switching device that provides backup to dedicated loads during grid failure
		  • both inverter types are connected to the grid and only the multimode inverter/s provide backup to dedicated loads on grid failure
		  • only the multimode inverter/s are connected to the grid; the grid-connected inverter/s are alternating current (AC) coupled to the multimode inverter/s and both types can provide backup to dedicated loads on grid failure

Product	Knowledge Evidence content advice	
	Energy management strategies may include:	• energy source switching options to reduce the maximum and surge demand, based on load profile analysis • heat pumps • tariff optimisation
UEERE0078 Install battery storage to power conversion equipment	System performance may include:	• return on investment • virtual power plants

	Typical configurations of battery storage systems for PV systems may include:	• multimode inverter/s for connecting to renewable energy, grid, loads and battery storage; this inverter/s provide backup to dedicated loads on grid failure and may:
		  • have a built in PCE for direct connection of a PV array or
		  • require a separate PCE to direct current (DC) couple the PV array and battery
		• two types of inverters comprising, photovoltaic grid-connected inverters and multimode inverters where:
		  • both inverter types are connected to the grid and loads via a switching device that provides backup to dedicated loads during grid failure
		  • both inverter types are connected to the grid and only the multimode inverter/s provide backup to dedicated loads on grid failure
		  • only the multimode inverter/s are connected to the grid; the grid-connected inverter/s are alternating current (AC) coupled to the multimode inverter/s and both types can provide backup to dedicated loads on grid failure

Product	Knowledge Evidence content advice	
	Energy management strategies may include:	• energy source switching options to reduce the maximum and surge demand, based on load profile analysis • heat pumps • tariff optimisation
UEERE0084 Manage renewable energy (RE) projects	project parameters may include:	• project scope • project stakeholders and clients • project phases and the relationship between phases • time requirements and limitations • resource requirements and limitations • quality requirements and limitations
	time management may include:	• time-management concepts • standard practices for ensuring a project runs to time
	financial management may include:	• financial management concepts • standard practices for managing project finances • project budget, costs, variations and estimations • invoicing against project phases/deliverables • and acquittals
	quality management may include:	• quality management concepts • standard practices for managing quality within a project
	human resource management may include:	• human resource management concepts • standard practices for managing personnel within a project
	stakeholder engagement may include:	• Customers • Suppliers • land holders • authorities • sub contractors

Product	Knowledge Evidence content advice	
	communication management may include:	• communication management concepts • standard practices for managing communication within a project
	risk management and contingencies may include:	• risk management concepts • standard practices for managing risk within a project • internal risks • external risks • risk minimisation • risk removal • contingencies
	procurement management may include:	• procurement management concepts • standard practices for managing procurement

	physical resource management may include:	• types of physical resources including:
		  • equipment
		  • technology
		  • information
		  • facilities
		• physical resource management concepts
		• standard practices for managing physical resources

	Contracts may include:	• understanding project contracts • standard practices for working to contract specifications • contract format • contract content • legal obligations of contract parties and accompanying documentation • including contract schedules
	performance assessment and continuous improvement may include:	• standard performance assessment practices • standard continuous improvement practices

Product	Knowledge Evidence content advice	
	WHS/OHS and enterprise responsibilities may include:	• provisions of relevant WHS/OHS legislation • principles and practices of effective WHS/OHS management • management arrangements relating to regulatory compliance • enterprise hazards and risks, control measures and relevant expertise required • characteristics and composition of workforce and their impact on WHS/OHS management • relevance of enterprise management systems to WHS/OHS management • analysis of working environment and design of appropriate WHS/OHS management systems • analysis of relevant data and evaluation of WHS/OHS system effectiveness • assessment of resources to establish and maintain WHS/OHS management systems
UEERE0085 Plan renewable energy (RE) projects	WHS/OHS and enterprise responsibilities may include:	• provisions of relevant WHS/OHS legislation • principles and practices of effective WHS/OHS management • management arrangements relating to regulatory compliance • enterprise hazards and risks, control measures and relevant expertise required • characteristics and composition of workforce and their impact on WHS/OHS management • relevance of enterprise management systems to WHS/OHS management • analysis of working environment and design of appropriate WHS/OHS management systems • analysis of relevant data and evaluation of WHS/OHS system effectiveness • assessment of resources to establish and maintain WHS/OHS management systems

Product	Knowledge Evidence content advice	
UEERE0086 Promote sustainable energy practices	climate change and its impacts may include:	• the possible impact of climate change in Australia • techniques for improving the understanding of climate change • techniques for communicating to and educating the general public on greenhouse gas induced climate change • adaptation to climate change encompassing: • salient points in each of the key sectors that require analysis and the strategies required in the need for adaptation to climate change
	greenhouse gas emissions profile may include:	• goals and principles of the National Greenhouse Strategy (NGS) • what a greenhouse gas inventory is, why it is required, and the sectors to which it applies • uses to which the National Greenhouse Gas Inventory can be applied
	Government incentives for sustainable practices may include:	• actions achievable by each level of government to implement the NGS • methods by which the community activity can be engaged in the reduction of greenhouse gas emissions • initiatives that can be undertaken by the private sector to reduce greenhouse gas emissions • advantages of international partnerships • emissions trading system
	efficient and sustainable energy use and supply may include:	• techniques for reducing the greenhouse intensity of energy supply • types of renewable energy (RE) sources suitable for use in Australia • methods and technique for improving end-use efficiency

Product	Knowledge Evidence content advice	
	efficient transport and sustainable urban planning may include:	• how integrating land use and transport planning can assist the greenhouse problem • how each of the following can be used to mitigate greenhouse gas; travel demand and traffic management strategies; encouraging greater use of public transport, walking and cycling; freight and logistics systems; improving vehicle fuel efficiency and fuel technologies
	greenhouse sinks and sustainable land management may include:	• how enhancing greenhouse sinks and encouraging sustainable forestry and vegetation management can complement the AGS • how greenhouse gas emissions are obtained from agricultural production and describe techniques to mitigate the emissions
	models of greenhouse best practice in industrial processes and waste management may include:	• types and methods of reducing greenhouse gas emissions from industry • methods of reducing methane emissions from waste treatment and disposal • building the business case for change

Renewable Energy Unit Matrix

The Renewable Energy project TAC developed a matrix to guide development of content related to the design, installation, maintenance and inspection of grid-connected, off-grid and micro-grid renewable energy systems.

<table>
<tr><th rowspan="2">System Type</th><th rowspan="2">Technology Type</th><th colspan="6">Function</th></tr>
<tr><th>Site Survey</th><th>Design</th><th>Install source to PCE</th><th>Install PCE to load</th><th colspan="2">Maintenance, fault finding and repair</th><th>Inspection</th></tr>
<tr><td rowspan="2">Grid Connected</td><td>Photovoltaic</td><td rowspan="2">UEERE0054 Conduct site survey for grid-connected photovoltaic and battery storage systems</td><td>UEERE0061 Design grid-connected photovoltaic power supply systems</td><td>UEERE0081 Install photovoltaic systems to power conversion equipment</td><td>UEERE0080 Install photovoltaic power conversion equipment to grid</td><td rowspan="2">UEERE0070 Fault find and repair grid-connected photovoltaic power supply systems</td><td rowspan="3">UEERE0082 Maintain renewable energy (RE) apparatus</td><td rowspan="2">UEERE0072 Inspect grid connected renewable energy systems</td></tr>
<tr><td>Storage</td><td>UEERE0060 Design grid-connected battery storage systems</td><td>UEERE0078 Install battery storage to power conversion equipment</td><td>UEERE0077 Install battery storage equipment power conversion equipment to grid</td></tr>
<tr><td rowspan="3">Off Grid</td><td>Photovoltaic / Genset</td><td rowspan="3">UEERE0055 Conduct site survey for off-grid photovoltaic/generating set systems</td><td>UEERE0063 Design off-grid photovoltaic/ generating set systems</td><td>Covered by Grid Connected content above</td><td rowspan="3">UEERE0079 Install off-grid power conversion equipment to electrical installation</td><td rowspan="3">UEERE0071 Fault find and repair off-grid PV/genset systems to an electrical installation</td><td rowspan="3">UEERE0074 Inspect off-grid renewable energy systems</td></tr>
<tr><td>Wind</td><td>UEERE0065 Design wind energy systems</td><td>UEERE0076 Install and maintain wind energy systems to power conversion equipment</td><td rowspan="2">UEERE0056 Coordinate maintenance of renewable energy (RE) apparatus and systems</td></tr>
<tr><td>Micro-Hydro</td><td>UEERE0062 Design micro-hydro systems</td><td>UEERE0075 Install and maintain micro hydro energy systems to power conversion equipment</td></tr>
<tr><td colspan="2">Micro Grid</td><td colspan="2">UEERE0057 Coordinate the design of micro-grid renewable energy systems</td><td colspan="3">UEERE0058 Coordinate the installation, fault finding and repair of micro grid systems</td><td>UEERE0073 Inspect micro grid renewable energy systems</td></tr>
</table>

ATTACHMENT F: ELECTROTECHNOLOGY TRAINING PACKAGE DISCIPLINES

The recoding of the Electrotechnology Training Package disciplines has been updated below:

OLD DISCIPLINE LETTER	OLD DISCIPLINE	NEW DISCIPLINE LETTERS	NEW DISCIPLINE
A	Assembly	AS	Assembly
B	Broadcast	EC	Electronics and Communications
C	Commercial	CO	Commercial
D	Computerised Systems	CS	Computer Systems
E	Cross-Discipline	CD	Cross Discipline
F	Data and Voice	DV	Data and Voice
G	Electrical	EL	Electrical
H	Electronic	EC	Electronics and Communications
I	Instrument	IC	Instrumentation and Control
J	Refrigeration and Air Conditioning	RA	Refrigeration and air-conditioning
K	Renewable and Sustainable	RE	Renewable Energy
M	Hazardous	HA	Hazardous
N	Rail	RS	Rail Signalling
P	Restricted	RL	Restricted Licensing
R	Research	CO	Research

ATTACHMENT G: COMPANION VOLUME IMPLEMENTATION GUIDE

QUALITY ASSURANCE PROCESS

A CVIG is initiated in accordance with the requirements of the National Skills Standard Council (NSSC) Standards for Training Packages and is located within the CVIG.

The steps in the Quality Assurance (QA) process as they apply to the CVIG are:

1. The CVIG is developed by the Industry Skills Specialist (ISS) in accordance with Standards 11 and 12 (NSSC Standards for Training Packages):
    - **Standard 11:** A quality assured Companion Volume Implementation Guide produced by the Training Package developer is available at the time of endorsement and complies with the Companion Volume Implementation Guide template.
    - **Standard 12:** Training Package developers produce other quality assured companion volumes to meet the needs of their stakeholders as required.
2. Content is validated and amended as part of the validation stage in the implementation of the Standards.
3. The CVIG is submitted for external QA with the Training Package changes, to ensure it is available at the time of endorsement.
4. As the implementation of the Standards continues for the Training Package, the CVIG is reviewed by the ISS to ensure mapping tables are updated and any additional information is added as required. Proposed changes are subject to industry validation as part of the Endorsement process.
5. Where changes are made to a Training Package and minor amendments are required for the CVIG, the ISS includes amendments as part of the validation phase and incorporates the reference in the version control modification history at the front of the CVIG.

COMPANION VOLUME IMPLEMENTATION GUIDE TEMPLATE

COMPANION VOLUME IMPLEMENTATION GUIDE FOR UET ELECTROTECHNOLOGY

Mandatory field

OVERVIEW INFORMATION *Mandatory field*	Version control and modification history. List of AQF qualifications, Skill Sets and Units of Competency in the Training Package. Unit mapping information, including equivalence table linking old to new Units of Competency. Qualification mapping information, including equivalence table linking old to new qualification. List of imported and prerequisite units in the Training Package. Key work and training requirements in the industry.

	Regulation and licensing implications for implementation.
IMPLEMENTATION INFORMATION *Mandatory field*	Information on the key features of the Training Package and the industry that will impact on the selection of training pathways. Industry sectors and occupational outcomes of qualifications. Explanation of any mandatory entry requirements for qualifications. Pathways advice, particularly in line with requirements of the AQF Pathways Policy. Access and equity considerations. Foundation Skills. Advice on any health and safety implications in the industry. Resource and equipment lists relevant to the Training Package. Legal considerations for learners in the workplace/on placements. Other information relevant to implementation of the Training Package.
LINKS *Optional field*	Resources supporting the companion volume implementation guide. Other companion volumes as required including: ○ Learning strategies guidance, describing the diversity of learners and learning strategies. ○ Knowledge guidance, identifying contextual information such as knowledge requirements and resources. ○ Assessment strategies, providing guidance on implementation of assessment requirements. Training Package developer's quality assurance process for companion volumes.