



**Australian Government**

# **UEE50420 Diploma of Electrical Engineering**

**Release 1**

# UEE50420 Diploma of Electrical Engineering

## Modification History

Release 1. This is the first release of this qualification in the UEE Electrotechnology Training Package

## Qualification Description

This qualification cover competencies to develop, select, commission, maintain and diagnose faults/malfunctions on advanced electrical equipment and systems.

No licensing, legislative or certification requirements apply to this qualification at the time of publication.

## Entry Requirements

The entry requirement for this qualification is:

- UEE30820 Certificate III in Electrotechnology Electrician

or

- a current 'Unrestricted Electricians Licence' or its equivalent issued in an Australian state or territory.

## Packaging Rules

A total of **760 weighting points** comprising:

**160 core weighting points** listed below; **plus**

**600 general elective weighting points** from the general elective units listed below.

Choose a total of **600 weighting points** elective units from the list below, of which between 0 and **270 weighting points** can be taken from Group A; between 0 and **100 weighting points** can be taken from Group B; between 0 and **240 weighting points** can be taken from Group C; and between **260 and 600 weighting points** can be taken from Group D (or all elective units between 0 and **600 weighting points** must can be taken from Group D).

**Up to 270 weighting points of the general elective units Group A**, may be selected, with appropriate contextualisation, from any relevant nationally endorsed Training Package or accredited course, provided selected units contribute to the vocational outcome of the qualification. Previously assigned weighting points are listed in the UEE Electrotechnology Training Package Companion Volume Implementation Guide (CVIG), if not listed weighting points will be 10 points, unless directed from the Electrotechnology Industry Reference Committee (IRC).

There are units of competency within this qualification that contain pre-requisites. Units of

competency that have a pre-requisite requirement are identified by this symbol \*. Refer directly to the units of competency to identify pre-requisite requirements to ensure all are complied with. A list of all pre-requisites is also provided in the UEE Pre-requisite Companion Volume.

Where imported units are selected, care must be taken to ensure all pre-requisite units specified are complied with.

### **Core units** **Weighting Points**

|           |  |    |
|-----------|--|----|
| UEECD0010 | Compile and produce an energy sector detailed report                                       | 60 |
| UEECD0024 | Implement and monitor energy sector WHS policies and procedures                            | 20 |
| UEECD0027 | Participate in development and follow a personal competency development plan               | 20 |
| UEECD0060 | Write specifications for electrotechnology engineering projects                            | 40 |
| UEERE0013 | Develop strategies to address environmental and sustainability issues in the energy sector | 20 |

### **Group A: Imported and common elective units** **Weighting Points**

|           |  |    |
|-----------|--|----|
| BSBCUS201 | Deliver a service to customers                                       | 20 |
| BSBINM501 | Manage an information or knowledge management system                 | 50 |
| BSBINN502 | Build and sustain an innovative work environment                     | 50 |
| BSBMGT502 | Manage people performance  | 70 |
| BSBMGT516 | Facilitate continuous improvement                                    | 60 |
| BSBWOR502 | Lead and manage team effectiveness                                   | 60 |
| ICTICT203 | Operate application software packages                                | 20 |
| UEECD0011 | Comply with scheduled and preventative maintenance program processes | 20 |
| UEECD0035 | Provide basic instruction in the use of electrotechnology apparatus  | 20 |
| UEECO0002 | Maintain documentation   | 20 |
| UEECO0015 | Provide quotations for installation or service jobs                  | 20 |

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| UEECO0017 | Source and purchase material/parts for installation or service jobs | 20 |
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**Group B: General elective units****Weighting Points**

|            |  |    |
|------------|--|----|
| UEEAS0007  | Assemble, mount and connect control gear and switchgear*   | 40 |
| UEEAS0008  | Fabricate and assemble bus bars*   | 40 |
| UEEAS0009  | Mount and wire control panel equipment*  | 40 |
| UEECD0028  | Plan an integrated cabling installation system*  | 40 |
| UEECS0033  | Use engineering applications software on personal computers                                      | 40 |
| UEEDV0005  | Install and maintain cabling for multiple access to telecommunication services*                  | 80 |
| UEEDV0008  | Install, modify and verify coaxial and structured communication copper cabling*                  | 40 |
| UEEEEC0003 | Assemble and set up basic security systems*  | 80 |
| UEEEEC0060 | Repairs basic electronic apparatus faults by replacement of components*                          | 40 |
| UEEEEC0075 | Troubleshoot single phase input d.c power supplies*  | 40 |
| UEEEL0004  | Carry out basic repairs to electrical components and equipment*                                  | 40 |
| UEEEL0013  | Install, set up and commission interval metering*  | 20 |
| UEEEL0016  | Provide advice on effective and energy efficient lighting products                               | 20 |
| UEEEL0017  | Repair and maintain mechanical components of electrical machines*                                | 40 |
| UEEEL0022  | Supply effective and efficient lighting products for domestic and small commercial applications* | 40 |
| UEEEL0026  | Align and install traction lift equipment*   | 20 |
| UEEEL0033  | Conduct electrical tests on LV electrical machines*  | 40 |
| UEEEL0034  | Conduct mechanical tests on electrical machines and components*                                  | 40 |

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| UEEEL0045 | Diagnose and rectify faults in traction lift systems*  | 80 |
| UEEEL0046 | Find and repair faults in LV d.c. electrical apparatus and circuits*                             | 60 |
| UEEEL0048 | Install and maintain emergency lighting systems*   | 40 |
| UEEEL0049 | Install and maintain emergency safety systems*   | 60 |
| UEEEL0052 | Maintain and service traction lift systems and equipment*  | 40 |
| UEEEL0053 | Maintain operation of electrical marine equipment and systems*                                   | 60 |
| UEEEL0054 | Maintain operation of electrical mining equipment and systems*                                   | 60 |
| UEEEL0055 | Overhaul and repair major switchgear and control gear*   | 60 |
| UEEEL0056 | Place and connect electrical coils*  | 40 |
| UEEEL0061 | Provide advice on the application of energy efficient lighting for ambient and aesthetic effect* | 20 |
| UEEEL0066 | Rewind LV direct current machines*   | 60 |
| UEEEL0067 | Rewind single phase machines*  | 40 |
| UEEEL0068 | Rewind three phase low voltage induction machines*   | 60 |
| UEEEL0069 | Select and arrange equipment for special LV electrical installations*                            | 60 |
| UEEEL0074 | Wind electrical coils*   | 40 |
| UEEHA0001 | Conduct detailed inspection of electrical installations for hazardous areas*                     | 40 |
| UEEHA0003 | Determine the explosion-protection requirements to meet a specified classified hazardous area*   | 40 |
| UEEHA0004 | Enter a classified hazardous area to undertake work related to electrical equipment              | 40 |
| UEEHA0005 | Install explosion-protected equipment and associated apparatus and wiring systems*               | 60 |
| UEEHA0006 | Maintain equipment associated with hazardous areas*  | 60 |

|  |   |                         |
|--|---|-------------------------|
| UEEIC0002                              | Assemble, enter and verify operating instructions in microprocessor equipped devices* | 20                      |
| UEEIC0011                              | Develop electrical integrated systems*  | 20                      |
| UEEIC0013                              | Develop, enter and verify discrete control programs for programmable controllers*     | 60                      |
| UEEIC0024                              | Plan the electrical installation of integrated systems*                               | 20                      |
| UEEIC0038                              | Solve problems in density/level measurement components and systems*                   | 40                      |
| UEEIC0039                              | Solve problems in flow measurement components and systems*                            | 40                      |
| UEEIC0041                              | Solve problems in pressure measurement components and systems*                        | 40                      |
| UEEIC0043                              | Solve problems in temperature measurement components and systems*                     | 40                      |
| UEEIC0047                              | Use instrumentation drawings, specifications, standards and equipment manuals*        | 40                      |
| UEERA0035                              | Establish the basic operating conditions of air conditioning systems*                 | 20                      |
| UEERA0036                              | Establish the basic operating conditions of vapour compression systems*               | 60                      |
| UEERA0059                              | Prepare and connect refrigerant tubing and fittings*                                  | 40                      |
| UEERE0016                              | Install, configure and commission LV grid-connected photovoltaic power systems*       | 40                      |
| UEERE0022                              | Solve basic problems in photovoltaic energy apparatus and systems*                    | 20                      |
| UETTDRIS44                             | Perform HV field switching operation to a given schedule*                             | 40                      |
| UETTDRIS67                             | Solve problems in energy supply network equipment*                                    | 80                      |
| UETTDRIS68                             | Solve problems in energy supply network protection equipment and systems*             | 40                      |
| <b>Group C: General elective units</b> |   | <b>Weighting Points</b> |
| UEECO0001                              | Estimate electrotechnology projects   | 40                      |

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|-----------|---|----|
| UEEEL0007 | Develop detailed electrical drawings*   | 60 |
| UEEEL0027 | Carry out low voltage electrical field testing and report findings*                                   | 60 |
| UEEEL0029 | Conduct compliance inspection of LV electrical installations with demand exceeding 100 A per phase*   | 40 |
| UEEEL0030 | Conduct compliance inspection of single phase LV electrical installations*                            | 60 |
| UEEEL0031 | Conduct compliance inspection of special LV electrical installations*                                 | 60 |
| UEEEL0032 | Conduct electrical tests on HV electrical machines*   | 60 |
| UEEEL0036 | Design effective and efficient lighting for residential and commercial buildings*                     | 20 |
| UEEEL0040 | Develop compliance policies and plans to conduct an electrical contracting business*                  | 80 |
| UEEEL0044 | Diagnose and rectify faults in complex lift systems*  | 40 |
| UEEEL0050 | Install and replace low voltage current transformer metering*   | 20 |
| UEEEL0051 | Investigate and report on electrical incidents and causes*  | 60 |
| UEEEL0057 | Plan electrical installations with a low voltage demand up to 400 A per phase*                        | 40 |
| UEEEL0059 | Plan low voltage switchboard and control panel layouts*   | 40 |
| UEEEL0060 | Prepare quotations for the supply of effective and efficient lighting products for lighting projects* | 20 |
| UEEEL0063 | Provide photometric data for illumination system design   | 60 |
| UEEEL0064 | Rewind HV three phase induction machines rated for voltages above 3.3 kV*                             | 60 |
| UEEEL0065 | Rewind HV three phase induction machines rated for voltages to 3.3 kV*                                | 60 |
| UEEEL0070 | Select effective and efficient light sources and luminaries for given locations and designs*          | 60 |
| UEEEL0071 | Select low voltage power factor correction equipment*   | 40 |

|           |  |    |
|-----------|--|----|
| UEEEL0072 | Set up and place LV electrical apparatus and associated circuits into service*                   | 40 |
| UEEEL0073 | Verify compliance and functionality of special LV electrical installations*                      | 40 |
| UEEIC0009 | Develop an electrical integrated system interface for access through a touch screen*             | 20 |
| UEEIC0012 | Develop structured programs to control external devices*   | 40 |
| UEEIC0014 | Develop, enter and verify programs in supervisory control and data acquisition systems*          | 60 |
| UEEIC0015 | Develop, enter and verify word and analogue control programs for programmable logic controllers* | 60 |
| UEEIC0018 | Diagnose and rectify faults in digital controls systems*   | 60 |
| UEEIC0020 | Fault find and repair analogue circuits and components in electronic control systems*            | 60 |
| UEEIC0026 | Provide solutions to fluid circuit operations*   | 60 |
| UEEIC0027 | Provide solutions to pneumatic-hydraulic system operations*                                      | 80 |
| UEEIC0028 | Provide solutions to problems in industrial control systems*                                     | 60 |
| UEEIC0034 | Set up industrial field control devices*   | 60 |
| UEEIC0040 | Solve problems in polyphase electronic power control circuits*                                   | 60 |
| UEEIC0042 | Solve problems in single phase electronic power control circuits*                                | 60 |
| UEERE0003 | Assess energy loads and uses for energy efficiency in commercial facilities*                     | 40 |
| UEERE0004 | Assess energy loads and uses for energy efficiency in industrial properties and enterprises*     | 40 |
| UEERE0005 | Assess energy loads and uses for energy efficiency in residential, office and retail premises*   | 40 |
| UEERE0011 | Design grid-connected photovoltaic power supply systems*   | 60 |



|           |   |    |
|-----------|---|----|
| UEERE0014 | Develop strategies to address sustainability issues for electrical installations* | 20 |
|-----------|---|----|

**Group D: General elective units****Weighting Points**

|           |   |     |
|-----------|---|-----|
| UEECD0013 | Develop and implement energy sector maintenance programs                                | 60  |
| UEECD0036 | Provide engineering solutions for problems in complex multiple path circuits            | 60  |
| UEECD0039 | Provide solutions to basic engineering computational problems*                          | 60  |
| UEECO0014 | Prepare tender submissions for electrotechnology projects*                              | 60  |
| UEEEL0006 | Develop detailed and complex drawings for electrical systems using CAD systems*         | 60  |
| UEEEL0011 | Evaluate performance of low voltage electrical apparatus*                               | 40  |
| UEEEL0035 | Design effective and efficient lighting for public, open and sports areas*              | 20  |
| UEEEL0037 | Design electrical installations with a low voltage demand greater than 400 A per phase* | 40  |
| UEEEL0062 | Provide engineering solutions to problems in complex polyphase power circuits*          | 60  |
| UEEIC0001 | Analyse complex electronic circuits controlling fluids                                  | 80  |
| UEEIC0005 | Configure and maintain industrial control system networks*                              | 60  |
| UEEIC0010 | Develop and test code for microcontroller devices                                       | 60  |
| UEEIC0016 | Diagnose and rectify faults in a.c. motor drive systems*                                | 60  |
| UEEIC0017 | Diagnose and rectify faults in d.c. motor drive systems*                                | 60  |
| UEEIC0019 | Diagnose and rectify faults in servo drive systems*                                     | 60  |
| UEERE0029 | Design micro-hydro systems rated to 6.4 kW*   | 60  |
| UEERE0030 | Design renewable energy (RE) heating systems*   | 120 |
| UEERE0032 | Design wind energy conversion systems (WECS) rated                                      | 60  |

to 10 kW\*

|           |   |    |
|-----------|---|----|
| UETTDRI69 | Diagnose and rectify faults in energy supply apparatus*                       | 60 |
| UETTDRI70 | Diagnose and rectify faults in electrical energy distribution systems*        | 60 |
| UETTDRI71 | Diagnose and rectify faults in electrical energy supply transmission systems* | 60 |
| UETTDRI72 | Diagnose and rectify faults in distributed generation systems*                | 60 |

## Qualification Mapping Information

This qualification replaces and is not equivalent to UEE50411 Diploma of Electrical Engineering

## Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>