



Australian Government

UEE63011 Advanced Diploma of Electrical Systems Engineering

Release: 2

UEE63011 Advanced Diploma of Electrical Systems Engineering

Modification History

| Release | Action | Core/Elective | Details | Points |
|---------|--------|---------------|---|--------|
| 2 | Add | Group B | UETTDRIS44A Perform HV field switching operation to a given schedule | 60 |
| 2 | Add | Group D | UETTDRIS69A Diagnose and rectify faults in energy supply apparatus | 60 |
| 2 | Add | Group D | UETTDRIS70A Diagnose and rectify faults in electrical energy distribution systems | 60 |
| 2 | Add | Group D | UETTDRIS71A Diagnose and rectify faults in electrical energy supply transmission systems | 60 |
| 2 | Add | Group D | UETTDRIS72A Diagnose and rectify faults in distributed Generation systems | 60 |
| 2 | Add | Group E | UETTDRIS74A Develop engineering solutions for energy supply system protection problems | 60 |
| 2 | Edit | | Edit Name to reflect correct Unit title UEENEED104A Use engineering applications software on personal computers | 40 |
| 2 | Edit | | Edit Name to Reflect correct Unit Title UEENEEI124A Fault find and repair analogue circuits and components in electronic control systems | |
| 2 | Edit | | Move unit from Elective Group C to Group B UETTDRIS67A Solve problems in energy supply network equipment | |
| 2 | Edit | | Move unit from Elective Group C to Group B UETTDRIS68A Solve problems in energy supply network protection equipment and systems | |

Description

Scope

This qualification provides competencies to develop, design and validate/evaluate, select, commission, maintain and diagnose faults/malfunctions on advanced electrical equipment and systems. Also, provides skills to manage risk, estimate and manage projects and provide technical advice/sales.

It develops competencies in the ethical and responsible application of mathematics, science, engineering techniques, Standards and Codes of Practice, engineering design practices, supervision and management of physical, human and financial resources in engineering.

Pathways Information

Not applicable.

Licensing/Regulatory Information

Not applicable.

Entry Requirements

Not applicable.

Employability Skills Summary

Not applicable.

Packaging Rules

Completion requirements

The requirements for granting this qualification will be met when competency is demonstrated and achieved for:

- All the Core competency standard units, defined in the Core Competency Standard Units table below and
- A combination of Elective competency standard units to achieve a total weighting of 580 points in accordance with the Elective Competency Standard Units table below.

Note: UEENEEG199A - Those holding an 'Unrestricted Electrical Fitter Licence or equivalent issued in an Australian State or Territory meet the requirements of this unit and its pre-requisite requirements.

| Core Competency Standard Units | | Weighting Points |
|---|---|------------------|
| All Core competency standard units to be achieved | | |
| UEENEE104A | Use engineering applications software on personal computers | 40 |
| UEENEE006B | Apply methods to maintain currency of industry developments | 20 |
| UEENEE011C | Manage risk in electrotechnology activities | 60 |
| UEENEE015B | Develop design briefs for electrotechnology projects | 40 |
| UEENEE071B | Write specifications for electrical engineering projects | 40 |
| UEENEE080A | Apply industry and community standards to engineering activities | 20 |
| UEENEE081A | Apply material science to solving electrotechnology engineering problems | 60 |
| UEENEE082A | Apply physics to solving electrotechnology engineering problems | 60 |
| UEENEE083A | Establish and follow a competency development plan in an electrotechnology engineering discipline | 120 |
| UEENEE101A | Apply Occupational Health and Safety regulations, codes and practices in the workplace | 20 |
| UEENEE102A | Fabricate, assemble and dismantle utilities industry components | 40 |

| Core Competency Standard Units | | Weighting Points |
|---|---|-------------------------|
| All Core competency standard units to be achieved | | |
| UEENEEE104A | Solve problems in d.c. circuits | 80 |
| UEENEEE105A | Fix and secure electrotechnology equipment | 20 |
| UEENEEE107A | Use drawings, diagrams, schedules, standards, codes and specifications | 40 |
| UEENEEE117A | Implement and monitor energy sector OHS policies and procedures | 20 |
| UEENEEE124A | Compile and produce an energy sector detailed report | 60 |
| UEENEEE125A | Provide engineering solutions for problems in complex multiple path circuits | 60 |
| UEENEEE126A | Provide solutions to basic engineering computational problems | 60 |
| UEENEEE137A | Document and apply measures to control OHS risks associated with electrotechnology work | 20 |
| UEENEEG006A | Solve problems in single and three phase low voltage machines | 80 |
| UEENEEG033A | Solve problems in single and three phase low voltage electrical apparatus and circuits | 60 |
| UEENEEG063A | Arrange circuits, control and protection for general electrical installations | 40 |
| UEENEEG101A | Solve problems in electromagnetic devices and related circuits | 60 |
| UEENEEG102A | Solve problems in low voltage a.c. circuits | 80 |
| UEENEEG106A | Terminate cables, cords and accessories for low voltage circuits | 40 |
| UEENEEG108A | Trouble-shoot and repair faults in low voltage electrical apparatus and circuits | 40 |
| UEENEEG109A | Develop and connect electrical control circuits | 80 |
| UEENEEG149A | Provide engineering solutions to problems in complex polyphase power circuits | 60 |

| Core Competency Standard Units | | Weighting Points |
|---|--|-------------------------|
| All Core competency standard units to be achieved | | |
| UEENEEG169A | Manage large electrical projects | 40 |
| UEENEEG170A | Plan large electrical projects | 60 |
| UEENEEG199A | Verify compliance and functionality of existing circuits | 40 |
| UEENEEK132A | Develop strategies to address environmental and sustainability issues in the energy sector | 20 |
| Total points in core | | 1580 |

| Elective Competency Standard Units | | | |
|--|--|-----------------------|-----------------------|
| Complete Elective units to achieve a total of weighting of 580 points from the following groups: | | | |
| Group | | Minimum points | Maximum points |
| A | Imported and Common Elective Units Imported units from other training packages and/or state accredited courses can be added to this group, but they must be selected from qualifications where the unit is first packaged at AQF level 6. If units have not being assigned a weighting by the relevant EE-Oz Industry Technical Advisory Committee, their weighting will be 10 points. | 0 | 220 |
| B | Qualification Elective Units | 0 | 160 |
| C | Qualification Elective Units | 0 | 160 |
| D | Qualification Elective Units | 0 | 160 |
| E | Qualification Elective Units You may select the majority of your elective units from this Group | 200 | 580 |

| Group A – Imported and Common Electives Units | | Weighting Points |
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| You may complete units to a maximum weighting of 220 | | |
| BSBMGT502B | Manage people performance | 70 |

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| BSBINM501A | Manage an information or knowledge management system | 50 |
| BSBMGT516C | Facilitate continuous improvement | 60 |
| BSBINN502A | Build and sustain an innovative work environment | 50 |
| BSBWOR502B | Ensure team effectiveness | 60 |
| | <p>Imported units from other training packages and/or state accredited courses can be added to this group, but they must be selected from qualifications where the unit is first packaged at AQF level 6. If units have not being assigned a weighting by the relevant EE-Oz Industry Technical Advisory Committee, their weighting will be 10 points.</p> <p>Note: For further information see Application of the NQC Flexibility Formula, UEE11 Electrotechnology Training Package, Version 1, Volume 1 Qualification Framework</p> | Up to 220 points |

| Group B – Qualification Elective Units | | Weighting Points |
|--|---|-------------------------|
| You may complete units to a maximum weighting of 160 | | |
| UEENEEA110A | Assemble, mount and connect control gear and switchgear | 40 |
| UEENEEA112A | Fabricate and assemble bus bars | 40 |
| UEENEEA113A | Mount and wire control panel equipment | 40 |
| UEENEEG107A | Select wiring systems and cables for low voltage general electrical installations | 60 |
| UEENEEG110A | Diagnose and rectify faults in d.c. electrical apparatus and circuits | 60 |
| UEENEEG111A | Carry out repairs to electrical apparatus | 40 |
| UEENEEG116A | Diagnose and rectify faults in lifts/escalator systems | 80 |
| UEENEEG118A | Maintain operation of electrical mining equipment and systems | 60 |
| UEENEEG119A | Maintain the operation of electrical marine equipment and systems | 60 |
| UEENEEG120A | Select and arrange circuits and equipment for special electrical installations | 60 |
| UEENEEG129A | Overhaul and repair switchgear and controlgear | 60 |
| UEENEEG150A | Wind electrical coils | 40 |
| UEENEEG151A | Place and connect electrical coils | 40 |
| UEENEEG152A | Rewind single phase machines | 40 |
| UEENEEG153A | Rewind LV three phase induction machines rated for low voltage | 60 |
| UEENEEG154A | Rewind LV direct current machines | 60 |
| UEENEEG157A | Conduct electrical tests on LV electrical machines | 40 |
| UEENEEG159A | Conduct mechanical tests of LV electrical machines | 40 |
| UEENEEG164A | Repair mechanical and electrical components of electrical machines | 40 |

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| UEENEEG165A | Maintain and service electrical traction lifts | 40 |
| UEENEEG166A | Installation and maintenance of escalators, tread ways and moving walks | 40 |
| UEENEEG167A | Align and install lift components and equipment | 20 |
| UEENEEG171A | Install, set up and commission interval metering | 20 |
| UEENEEG181A | Provide advice on effective and energy efficient lighting products | 20 |
| UEENEEG182A | Supply effective and efficient lighting products for domestic and small commercial applications | 40 |
| UEENEEG183A | Provide advice on the application of energy efficient lighting for ambient and aesthetic effect | 20 |
| UEENEEG189A | Install and maintain emergency lighting systems | 40 |
| UEENEEH102A | Repair basic electronic apparatus faults by replacement of components | 40 |
| UEENEEH111A | Troubleshoot single phase input d.c. power supplies | 40 |
| UEENEEH150A | Assemble and set up basic wired and wireless security systems | 80 |
| UEENEEI101A | Use instrumentation drawings, specifications, standards and equipment manuals | 40 |
| UEENEEI102A | Solve problems in pressure measurement circuits and systems | 40 |
| UEENEEI103A | Solve problems in density/level measurement circuits and systems | 40 |
| UEENEEI104A | Solve problems in flow measurement circuits and systems | 40 |
| UEENEEI105A | Solve problems in temperature measurement circuits and systems | 40 |
| UEENEEI116A | Enter and verify operating instructions in microprocessor equipped devices | 20 |
| UEENEEI138A | Provide solutions to extra low voltage (ELV) electro-pneumatic control systems and drives | 60 |
| UEENEEI140A | Plan the electrical installation of integrated systems | 20 |

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| UEENEEI141A | Develop electrical integrated systems | 20 |
| UEENEEI150A | Develop, enter and verify discrete control programs for programmable controllers | 60 |
| UEENEEJ102A | Prepare and connect refrigerant tubing and fittings | 30 |
| UEENEEJ103A | Establish the basic operating conditions of vapour compression systems | 60 |
| UEENEEJ104A | Establish the basic operating conditions of air conditioning systems | 20 |
| UEENEEM019A | Attend to breakdowns in hazardous areas — coal mining | 20 |
| UEENEEM020A | Attend to breakdowns in hazardous areas — gas atmospheres | 20 |
| UEENEEM021A | Attend to breakdowns in hazardous areas — dust atmospheres | 20 |
| UEENEEM022A | Attend to breakdowns in hazardous areas — pressurisation | 20 |
| UEENEEM027A | Maintain equipment in hazardous areas — coal mining | 60 |
| UEENEEM028A | Maintain equipment in hazardous areas — gas atmospheres | 60 |
| UEENEEM029A | Maintain equipment in hazardous areas — dust atmospheres | 60 |
| UEENEEM030A | Maintain equipment in hazardous areas — pressurisation | 60 |
| UEENEEM038A | Conduct testing of hazardous areas installations — coal mining | 40 |
| UEENEEM080A | Report on the integrity of explosion-protected equipment in hazardous area | 20 |
| UETTDRIS43A | Perform low voltage field switching operation to a given schedule. | 50 |
| UETTDRIS44A | Perform high voltage field switching operation to a given schedule | 40 |
| UETTDRIS47A | Sample, test, filter and reinstate insulating oil | 40 |
| UETTDRIS67A | Solve problems in energy supply network equipment | 80 |

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| UETTDRIS68A | Solve problems in energy supply network protection equipment and systems | 40 |
| UETTDRSB29A | Maintain capacitor bank equipment for voltage regulation | 40 |
| UETTDRSB39A | Perform power system substation switching operation to a given schedule | 50 |
| UETTDRIS67A | Solve problems in energy supply network equipment | 80 |
| UETTDRIS68A | Solve problems in energy supply network protection equipment and systems | 40 |
| UETTDRIS44A | Perform HV field switching operation to a given schedule | 40 |

| Group C – Qualification Elective Units | | Weighting Points |
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| You may complete units to a maximum weighting of 160 | | |
| UEENECC005B | Estimate electrotechnology projects | 40 |
| UEENEEL125A | Plan LV electrical installations with a demand up to 400A per phase | 40 |
| UEENEEL128A | Plan layouts for electrical switchboards and control panels | 40 |
| UEENEEL155A | Rewind three phase induction machines rated for HV to 3.3 kV | 60 |
| UEENEEL156A | Rewind three phase induction machines rated for HV above 3.3 kV | 60 |
| UEENEEL158A | Conduct electrical tests on HV electrical machines | 60 |
| UEENEEL162A | Set up and place LV electrical apparatus and associated circuits into service | 40 |
| UEENEEL168A | Diagnose and rectify faults in complex lifts equipment and systems | 40 |
| UEENEEL172A | Investigate and produce reports on electrical incidents | 60 |
| UEENEEL175A | Develop compliance policies and plans to conduct a electrical contracting business | 80 |
| UEENEEL179A | Develop detailed electrical drawings | 60 |
| UEENEEL184A | Provide photometric data for illumination system design | 60 |

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| UEENEEG185A | Select effective and efficient light sources and luminaires for given locations and designs | 60 |
| UEENEEG186A | Design effective and efficient lighting for residential and commercial buildings | 20 |
| UEENEEG188A | Prepare quotations for the supply of effective and efficient lighting products for lighting projects | 20 |
| UEENEEI119A | Set up transducers and field control devices | 60 |
| UEENEEI120A | Provide solutions to problems in industrial control systems | 60 |
| UEENEEI124A | Fault find and repair analogue circuits and components in electronic control systems | 60 |
| UEENEEI125A | Provide solutions to fluid circuit operations | 60 |
| UEENEEI126A | Provide solutions to pneumatic/hydraulic system operations | 80 |
| UEENEEI139A | Diagnose and rectify faults in digital controls systems | 60 |
| UEENEEI142A | Develop an electrical integrated system interface for access through a touch screen | 20 |
| UEENEEI143A | Develop access control of electrical integrated systems using logic-based programming tools | 20 |
| UEENEEI144A | Develop interfaces for multiple access methods to monitor, schedule and control an electrical integrated system | 20 |
| UEENEEI148A | Provide solutions to single phase electronic power control problems | 60 |
| UEENEEI149A | Provide solutions to polyphase electronic power control problems | 60 |
| UEENEEI151A | Develop, enter and verify programs for industrial control systems using high level instructions | 60 |
| UEENEEI152A | Develop, enter and verify programs in Supervisory Control and Data Acquisition systems | 60 |
| UEENEEI155A | Develop structured programs to control external devices | 40 |
| UEENEEM039A | Conduct testing of hazardous area installations — gas atmospheres | 40 |

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| UEENEEM042A | Conduct visual inspection of hazardous areas installations | 40 |
| UEENEEM044A | Conduct detailed inspection of hazardous areas installations — gas atmospheres | 40 |
| UEENEEM047A | Develop and manage maintenance programs for hazardous areas electrical equipment — coal mining | 20 |
| UEENEEM078A | Manage compliance of hazardous areas | 20 |

| Group D – Qualification Elective Units | | Weighting Points |
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| You may complete units to a maximum weighting of 160 | | |
| UEENEEC006B | Prepare tender submissions for electrotechnology projects | 60 |
| UEENEEE110A | Develop and implement energy sector maintenance programs | 60 |
| UEENEEL127A | Design LV electrical installations with a demand greater than 400 A per phase | 40 |
| UEENEEL131A | Evaluate performance of LV electrical apparatus | 40 |
| UEENEEL180A | Develop detailed and complex drawings for electrical systems using CAD systems | 60 |
| UEENEEL187A | Design effective and efficient lighting for public, open and sports areas | 20 |
| UEENEEI127A | Analyse complex electronic circuits controlling fluids | 80 |
| UEENEEI145A | Diagnose and rectify faults in a.c. motor drive systems | 60 |
| UEENEEI146A | Diagnose and rectify faults in d.c. motor drive systems | 60 |
| UEENEEI147A | Diagnose and rectify faults in servo drive systems | 60 |
| UEENEEI156A | Develop and test code for microcontroller devices | 60 |
| UEENEEI157A | Configure and maintain industrial control system networks | 60 |
| UEENEEL129A | Design renewable energy (RE) heating systems | 120 |
| UEENEEL131A | Design wind energy conversion systems (WECS) rated to 10 kW. | 60 |
| UEENEEL138A | Design micro-hydro power systems | 60 |

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| UEENEEM035A | Conduct a conformity assessment of explosion-protected equipment — coal mining | 40 |
| UEENEEM036A | Conduct a conformity assessment of explosion-protected equipment — gas atmospheres | 40 |
| UEENEEM037A | Conduct a conformity assessment of explosion-protected equipment — dust atmospheres | 40 |
| UEENEEM054A | Plan electrical installations for hazardous areas — gas atmospheres | 20 |
| UEENEEM064A | Conduct audit of hazardous areas installations — coal mining | 60 |
| UEENEEM065A | Conduct audit of hazardous areas installations — gas atmospheres | 60 |
| UEENEEM066A | Conduct audit of hazardous areas installations — dust atmospheres | 60 |
| UEENEEM067A | Assess the fitness-for-purpose of hazardous areas explosion-protected equipment — coal mining | 60 |
| UEENEEM068A | Assess the fitness-for-purpose of hazardous areas explosion-protected equipment — gas atmospheres | 60 |
| UEENEEM069A | Assess the fitness-for-purpose of hazardous areas explosion-protected equipment — dust atmospheres | 60 |
| UETTDRIS69A | Diagnose and rectify faults in energy supply apparatus | 60 |
| UETTDRIS70A | Diagnose and rectify faults in electrical energy distribution systems | 60 |
| UETTDRIS71A | Diagnose and rectify faults in electrical energy supply transmission systems | 60 |
| UETTDRIS72A | Diagnose and rectify faults in distributed Generation systems | 60 |

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| Group E – Qualification Elective Units | | Weighting Points |
| You must complete units to a minimum weighting of 200 | | |
| You may select all your elective units from this Group | | |
| UEENEEM007B | Manage contract variations | 40 |

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| UEENEEE127A | Use advanced computational processes to provide solutions to engineering problems | 80 |
| UEENEEE128A | Develop engineering solutions to photonic problems | 80 |
| UEENEEE160A | Provide engineering solutions for uses of materials and thermodynamic effects | 80 |
| UEENEEE161A | Analyse static and dynamic parameters of electrotechnology/utilities equipment | 80 |
| UEENEEE162A | Select drive components for equipment design | 80 |
| UEENEEE163A | Analyse materials for suitability in electrotechnology/utilities equipment | 80 |
| UEENEEE164A | Design electrical machine drives and production layout plans | 80 |
| UEENEEE078B | Contribute to risk management in electrotechnology systems | 20 |
| UEENEEG130A | Design electrical switchboards rated for high fault levels | 60 |
| UEENEEG143A | Develop engineering solutions for synchronous machine problems | 60 |
| UEENEEG144A | Develop engineering solutions for direct current machine problems | 60 |
| UEENEEG145A | Develop engineering solutions for induction machine problems | 60 |
| UEENEEG160A | Evaluate performance of LV electrical machines | 40 |
| UEENEEG161A | Design and develop modifications for electrical machines | 60 |
| UEENEEH147A | Assess compliance of electronic apparatus | 60 |
| UEENEEH184A | Modify DSP based sub-systems | 80 |
| UEENEEH185A | Design a signal-conditioning subsystem | 80 |
| UEENEEH188A | Design and develop electronics/computer systems projects | 40 |
| UEENEEI123A | Design electronic control and instrumentation systems | 60 |
| UEENEEI128A | Set up controls on complex fluid systems | 80 |

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| UEENEEI129A | Set up electronically controlled mechanically operated complex systems | 80 |
| UEENEEI130A | Set up electronically controlled robotically operated complex systems | 80 |
| UEENEEI153A | Design and configure Human-Machine Interface (HMI) networks | 60 |
| UEENEEI154A | Design a computer based control system | 120 |
| UEENEEK133A | Design hybrid renewable power systems | 80 |
| UEENEEK139A | Design stand-alone renewable energy power systems | 40 |
| UEENEEK140A | Develop engineering solutions to renewable energy problems | 60 |
| UEENEEK146A | Design energy management controls systems for electrical installations in buildings | 80 |
| UEENEEK151A | Develop engineering strategies for energy reduction in buildings | 60 |
| UEENEEM052A | Classify hazardous areas — gas atmospheres | 40 |
| UEENEEM053A | Classify hazardous areas — dust atmospheres | 40 |
| UEENEEM057A | Design explosion-protected electrical systems and installations — gas atmospheres | 20 |
| UEENEEM058A | Design explosion-protected electrical systems and installations — dust atmospheres | 20 |
| UEENEEM059A | Design explosion-protected electrical systems and installations — pressurisation | 20 |
| UEENEEM075A | Design explosion-protected electrical systems — Coal mining | 20 |
| UEENEEM079A | Design of gas detection systems and installations | 20 |
| UETTDRIS73A | Develop engineering solutions for energy supply power transformer problems | 60 |
| UETTDRIS74A | Develop engineering solutions for energy supply system protection problems | 60 |

Note:

- 1.Pre-requisite pathways shall be identified and met for all elective units selected.
- 2.In selecting elective units considerations to career planning advice should be given to units that form part of a pre-requisite pathway for the progression to achieve particular competencies or qualification at a higher level.
- 3.Registered training organisations shall also provide information related to the relevant pathway(s) that may be taken to achieve paraprofessional status ("associate membership") with a professional engineering membership organisation.

END OF QUALIFICATION**Custom Content Section**

Not applicable.