

Certificate III Electrotechnology Systems Electrician — National module and assessment structure

EE QSB Australia

Competency Standard Units incorporating the essential capabilities required of a Licensed Electrician



Competency Standard Units incorporating essential capabilities required of a "Licensed Electrician"

Essential capabilities	Status	Competency Standards Unit	Supporting National Modules
1. Demonstrate a knowledge of basic electrical and energy concepts.	Essential	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE052 Applied electricity 1
2. Demonstrate a knowledge of the various effects of electric current.	Critical	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE052 Applied electricity 1 NUE505A Electrical systems safety
3. Demonstrate a knowledge of resistivity and resistors.	Essential	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE052 Applied electricity 1 NUE054 Applied Electricity 2
4. Demonstrate a knowledge of the various sources of electromotive force (e.m.f.).	Essential	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE054 Applied Electricity 2
5. Explain the operation of a simple practical circuit.	Critical	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units..</i>	NUE052 Applied electricity 1 NUE054 Applied Electricity 2
6. Determine the resistance, voltage, current and power in any part of a DC circuit using theory and actual measurement methods.	Critical	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE054 Applied Electricity 2 NUE505A Electrical systems safety
7. Demonstrate a knowledge of the theory and application of Capacitors and Inductors.	Essential	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units..</i>	NUE054 Applied Electricity 2

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8. Demonstrate a knowledge of permanent and electro magnetic theory and application.	Essential	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE045 Applied Electromagnetism
9. Demonstrate a knowledge of electromagnetic induction and state practical examples which make use of this principle.	Essential	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE045 Applied Electromagnetism NUE056 Applied Electricity 4
10. Demonstrate a knowledge of Capacitance and Inductance in AC circuits and their effects.	Essential	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE056 Applied Electricity 4
11. Demonstrate a knowledge of alternating voltage & current generation, phase relationships, energy in an AC circuit, and actual measurement methods.	Critical	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE056 Applied Electricity 4 NUE057 Applied Electricity 5 NUE 505A Electrical systems safety NEWP402b Test apparatus and circuits - Electrical work performance
12. Describe Star and Delta three phase AC systems and the reason why three phase is used.	Essential	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE057 Applied Electricity 5
13. Demonstrate an understanding of the fundamental safety principles of the AS/NZS 3000:2000 Section 1.	Critical	<i>This capability is fundamental to safety and is included in the elements and under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE400 Electrical installations— protection methods and devices NUE403 Electrical installations — design and equipment selection NUE 505A Electrical systems safety <i>Included in Work Performance Module for core competency standard unit</i>

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14. Demonstrate a knowledge of power factor, power factor improvement principles and power measurement techniques to AC circuits in 1 and multiphase systems.	Essential	<i>This capability is fundamental to understanding electricity, its hazards and safe use and the principles of electrical equipment and circuits and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE057 Applied Electricity 5
15. Describe the rationale and operating principles and characteristics of three phase induction motors and generators.	Essential	<i>This capability is fundamental to understanding the principles of electrical machines and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE 046 Alternating current machines
16. Describe methods of electric motor selection, starting, connection and protection.	Critical	UTE NES106bA Install Electretical/electronic apparatus— <i>electrical</i>	NUE 046 Alternating current machines NUE 505A Electrical systems safety NEWP106b Install electrical/electronic apparatus - <i>Electrical work performance</i>
17. Describe the AS/NZ 3000:2000 and local Supply Authority requirements for three phase motor installations and starters.	Essential	UTE NES106bA Install Electretical/electronic apparatus— <i>electrical</i>	NE 32.1 Circuit Development 1 NUE 046 Alternating current machines NEWP106b Install electrical/electronic apparatus - <i>Electrical work performance</i>
18. Describe the possible causes of malfunction of three phase induction motors and demonstrate the tests required for diagnosing faults	Essential	NES403bA Test apparatus and circuits— <i>electrical</i> NES501bA Diagnose and rectify faults in apparatus and associated circuits— <i>electrical</i>	NUE 046 Alternating current machines NEWP402b Test apparatus and circuits - <i>Electrical work performance</i> NEWP501b Diagnose and rectify faults in apparatus and associated circuits - <i>Electrical work performance</i>
19. Describe the operating principles, typical control methods and characteristics of single phase motors and their key components.	Essential	<i>This capability is fundamental to understanding the principles of electrical machines and is included under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE 046 Alternating current machines
20. Describe the suitability of various types of single phase motors for particular applications and describe the fault finding methods.	Essential	<i>This capability is fundamental to understanding the principles of electrical machines and is included under the 'Critical aspects of evidence' of relevant core competency standard units.</i>	NUE 046 Alternating current machines

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21. Describe and apply in practice the requirements of AS/NZ 3000:2000 in relation to earthing arrangements and fault loop impedance calculations.	Critical	UTE NES105jA Install and terminate wiring— <i>low voltage power & control</i>	NUE400 Electrical installations— protection methods and devices NUE403 Electrical installations — design and equipment selection NUE 505A Electrical systems safety NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance
22. Demonstrate a comprehensive knowledge and understanding of the MEN system and its application, including on sub-installations.	Critical	UTE NES105jA Install and terminate wiring— <i>low voltage power & control</i>	NUE057 Applied Electricity 5 NUE400 Electrical installations— protection methods and devices NUE403 Electrical installations — design and equipment selection NUE 505A Electrical systems safety NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance
23. Describe the basic construction of transformers.	Essential	<i>This capability is fundamental to understanding the principles of electrical machines and is included under the 'Critical aspects of evidence' of core competency standard units</i>	NUE 048.1 Single and three phase transformers
24. Demonstrate understanding of the principle of operation of transformers.	Essential	<i>This capability is fundamental to understanding the principles of electrical machines and is included under the 'Critical aspects of evidence' of core competency standard units</i>	NUE 048.1 Single and three phase transformers
25. List the main types of transformers.	Essential	<i>This capability is fundamental to understanding the principles of electrical machines and is included under the 'Critical aspects of evidence' of relevant core competency standard units</i>	NUE 048.1 Single and three phase transformers
26. List typical applications of various types of transformers and key safety issues.	Critical	<i>This capability is fundamental to safety and is included in the elements and under the 'Critical aspects of evidence' of core competency standard units.</i>	NUE 048.1 Single and three phase transformers NUE 505A Electrical systems safety

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27. Describe and apply in practice the requirements for circuit protection using AS/NZS 3000:2000 and other relevant Australian Standards. Eg AS/NZS 3018.	Critical	NES106bA Install Electretical/electronic apparatus— <i>electrical</i>	NUE400 Electrical installations— protection methods and devices NUE403 Electrical installations — design and equipment selection NUE 505A Electrical systems safety NEWP106b Install electrical/electronic apparatus - <i>Electrical</i> work performance.
28. Demonstrate a knowledge of the SELV, PELV and earth leakage current protection systems and their application in accordance with AS/NZS 3000:2000.	Critical		NUE400 Electrical installations— protection methods and devices NUE403 Electrical installations — design and equipment selection NUE 505A Electrical systems safety
29. Demonstrate the ability to select cables for mains and submains using AS/NZS 3000:2000 and AS/NZS 3008.1 based on current carrying capacity, short circuit capacity, maximum demand and voltage drop, for single phase and three phase installations including multiple installations.	Critical	NES105jA Install and terminate wiring— <i>low voltage power & control</i>	NUE403 Electrical installations — design and equipment selection NUE 505A Electrical systems safety NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance
30. Demonstrate the ability to select cables for final subcircuits using AS/NZS 3000:2000 and AS/NZS 3008.1 based on current carrying capacity, short circuit capability, maximum demand, earth loop impedance and voltage drop.	Critical	NES105jA Install and terminate wiring— <i>low voltage power & control</i>	NUE403 Electrical installations — design and equipment selection NUE 505A Electrical systems safety NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance
31. Describe the control and protection requirements for installations and equipment. Demonstrate the ability to select suitable equipment and switchgear for a particular installation or part of an installation.	Critical	NES106bA Install Electretical/electronic apparatus— <i>electrical</i>	NUE400 Electrical installations— protection methods and devices NUE403 Electrical installations — design and equipment selection 3 NUE 505A Electrical systems safety NEWP106b Install electrical/electronic apparatus - <i>Electrical</i> work performance

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32. Demonstrate an understanding of the AS/NZS 3000:2000 and regulatory requirements for the location of switchboards and arrangement of switchboard equipment in installations	Essential	NES106bA Install Electelectrical/electronic apparatus— <i>electrical</i>	NUE403 Electrical installations — design and equipment selection
33. Demonstrate an understanding of the AS/NZS 3000:2000 and regulatory requirements for the installation of electrical equipment in given damp situations and wet areas.	Critical	NES105jA Install and terminate wiring— <i>low voltage power & control</i> NES106bA Install Electelectrical/electronic apparatus— <i>electrical</i>	NUE403 Electrical installations — design and equipment selection NUE 505A Electrical systems safety NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance NEWP106b Install electrical/electronic apparatus - <i>Electrical</i> work performance
34. Demonstrate the appropriate methods for the installation, modification and testing of electrical installations and equipment for construction and demolition sites, complying with AS/NZS 3012 and applicable workplace safety legislation.	Critical	UTE NES106bA Install Electelectrical/electronic apparatus— <i>electrical</i> UTE NES402bA Test apparatus and circuits— <i>electrical</i>	NUE403 Electrical installations — design and equipment selection NUE408 Electrical installations — testing and verification NUE 505A Electrical systems safety NEWP106b Install electrical/electronic apparatus - <i>Electrical</i> work performance NEWP402b Test apparatus and circuits - <i>Electrical</i> work performance
35. Demonstrate knowledge of AS/NZS 3000:2000 requirements for the installation of aerial conductors and underground wiring.	Critical	UTE NES105gA Install and terminate wiring— <i>cabling/wiring support & protection</i> UTE NES105jA Install and terminate wiring— <i>low voltage power & control</i>	NUE403 Electrical installations — design and equipment selection NUE 505A Electrical systems safety NEWP105g Install and terminate wiring systems (<i>Cable/wiring Support and Protection</i>) Work performance NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance

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36. Demonstrate a knowledge of the AS/NZS 3000:2000 requirements for electrical installations in hazardous areas and an awareness of the standards to which it refers (e.g. AS 2430, AS 2381.1).	Critical	UTE NES105jA Install and terminate wiring— <i>low voltage power & control</i> <i>Installation of wiring and equipment for hazardous areas is an optional competency standards unit.</i>	NUE403 Electrical installations — design and equipment selection NUE 505A Electrical systems safety
37. Demonstrate knowledge of the AS/NZS 3000:2000 requirements and the standards referenced for special electrical installations including emergency systems, and construction/demolition sites.	Essential		NUE403 Electrical installations — design and equipment selection
38. Describe and perform to AS/NZS 3000:2000 and AS/NZS 3017 standards the electrical checks and tests required to ensure electrical installations are safe.	Critical	UTE NES206b Maintain and repair apparatus and associated circuits - <i>Electrical</i> UTE NES403bA Test apparatus and circuits— <i>electrical</i>	NUE408 Electrical installations — testing and verification NUE 505A Electrical systems safety NEWP206b Maintain and repair apparatus and associated circuits - <i>Electrical work performance</i> NEWP402b Test apparatus and circuits - <i>Electrical work performance</i>
39. Demonstrate the reporting of test results for an electrical installation as typically required to satisfy regulatory requirements.	Essential	NES403bA Test apparatus and circuits— <i>electrical</i>	NUE408 Electrical installations — testing and verification NUE403 Electrical installations — design and equipment selection
40. Demonstrate the knowledge and skill to perform effective safe isolation of any equipment, including switch and lock off, circuit isolation, equipment testing and tagging procedures.	Critical	<i>This capability is fundamental to safety and is included in the elements and under the 'Critical aspects of evidence' of core competency standard units</i>	NBB002.1 Occupational health and safety NE172.2 Electrical wiring and equipment 1 NUE 505A Electrical systems safety <i>Included in Work Performance Module for core competency standard unit</i>
41. Describe the construction, specifications, colour coding and application of various types of cords and cables.	Essential		NE172.2 Electrical wiring and equipment 1

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42. Demonstrate the skill to prepare and terminate cords and cables.	Essential	UTE NES105jA Install and terminate wiring— <i>low voltage power & control</i>	NE172.2 Electrical wiring and equipment 1 NE173.1 Electrical wiring and equipment 2 NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance
43. Demonstrate the Selection and attachment of electrical accessories, using appropriate fixing devices and methods.	Essential	NES105gA Install and terminate wiring— <i>cabling/wiring support & protection</i> NES105jA Install and terminate wiring— <i>low voltage power & control</i>	NE172.2 Electrical wiring and equipment 1 NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance
44. Demonstrate the knowledge and skill to install and terminate a variety of electrical cables in a wide range of applications (including final subcircuits) to AS/NZS3000:2000.	Critical	UTE NES105jA Install and terminate wiring— <i>low voltage power & control</i>	NE173.1 Electrical wiring and equipment 2 NUE407 Electrical wiring systems NUE 505A Electrical systems safety NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance
45. Demonstrate the knowledge and skills for the installation of wiring support systems	Essential	UTE NES105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>)	NE173.1 Electrical wiring and equipment 2 NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance
46. Describe and perform the circuit tests required for electrical cables in a range of installations, with attention to the final subcircuit tests.	Critical	UTE NES402bA Test apparatus and circuits— <i>electrical</i>	NUE408 Electrical installation – testing and verification NE173.1 Electrical wiring and equipment 2 NUE407 Electrical wiring systems NUE 505A Electrical systems safety NEWP402b Test apparatus and circuits - <i>Electrical work performance</i>

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47. Install final subcircuit wiring into switchboards and connect to switchboard equipment in accordance with AS/NZS 3000:2000 and local supply authority requirements.	Critical	<p>UTE NES105jA Install and terminate wiring—<i>low voltage power & control</i></p> <p>UTE NES106b Install electrical/electronic apparatus - <i>Electrical</i></p>	<p>NE173.1 Electrical wiring and equipment 2</p> <p>NUE 505A Electrical systems safety</p> <p>NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance</p> <p>NEWP106b Install electrical/electronic apparatus - <i>Electrical</i> work performance</p>
48. Connect consumers mains to an installation, in accordance with AS/NZS 3000:2000 and local supply authority requirements.	Critical	NES105jA Install and terminate wiring— <i>low voltage power & control</i>	<p>NE173.1 Electrical wiring and equipment 2</p> <p>NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance</p>
49. Determine and apply AS/NZS 3000:2000 and AS/NZS 3008 requirements for the installing, terminating and testing of MIMS and Armoured cables. This is to include the cable type selection to AS2381 (or other standards) requirements.	Essential	<p>UTE NES105jA Install and terminate wiring—<i>low voltage power & control</i></p> <p>UTE NES402bA Test apparatus and circuits—<i>electrical</i></p> <p><i>Optional unit: NES 107^A Install explosion-protected equipment and wiring systems</i></p> <p><i>The selection of cables for hazardous areas is at an AQF level IV and is included in the competency standard unit NES 707 A Design electrical installations in hazardous areas, (See AS/NZS4761.1 Clause 2.5.14)</i></p>	<p>NUE407 Electrical wiring systems</p> <p>NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance</p> <p>NEWP402b Test apparatus and circuits - <i>Electrical</i> work performance</p>
50. Determine and apply AS/NZS 3000:2000 requirements for the installing, terminating and testing of catenary supported cables, pendant-type socket outlets and trailing cables.	Essential	<p>UTE NES105gA Install and terminate wiring—<i>cabling/wiring support & protection</i></p> <p>UTE NES105jA Install and terminate wiring—<i>low voltage power & control</i></p>	<p>NUE407 Electrical wiring systems</p> <p>NEWP105g Install and terminate wiring systems (<i>Cable/wiring Support and Protection</i>) Work performance</p> <p>NEWP105j Install and terminate wiring systems (<i>Power and control – Low Voltage</i>) Work performance</p>

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51. Demonstrate ability to read, sketch and interpret electrical diagrams.	Critical	<i>This capability is fundamental to electrical work functions and is therefore included in the elements of core competency standard units.</i>	NUE 062 Drawings and diagrams for electrical work NUE 505A Electrical systems safety <i>Included in Work Performance Module for core competency standard unit</i>
52. Design and connect switching circuits, including via electronic logic controls, as per AS/NZS 3000.	Essential		NE32.1 Circuit development 1 NUE 064 Electronic power and control 1
53. Describe basic statutory occupational safety and health responsibilities for employers and employees, including supervisory requirements and employees' own "duty of care".	Critical	<i>This capability is fundamental to safety and is included in the elements and under the 'Critical aspects of evidence' of core competency standard units</i>	NBB002.1 Occupational health and safety NUE 505A Electrical systems safety <i>Included in Work Performance Module for core competency standard unit</i>
54. Demonstrate understanding of the requirements for personal safety in the workplace including safe isolation and application of safety practices.	Critical	<i>This capability is fundamental to safety and is included in the elements and under the 'Critical aspects of evidence' of core competency standard units</i>	NE172.2 Electrical wiring and equipment 1 NBB002.1 Occupational health and safety NUE 044 Electrical safe working practice NUE 505A Electrical systems safety <i>Included in Work Performance Module for core competency standard unit</i>
55. Describe a workplace safety check, identify potential workplace hazards and suggest measures for accident prevention.	Essential	<i>This capability is fundamental to safety and is included in the elements and under the 'Critical aspects of evidence' of core competency standard units</i>	NBB002.1 Occupational health and safety. NE172.2 Electrical wiring and equipment 1 NUE 044 Electrical safe working practice <i>Included in Work Performance Module for core competency standard unit</i>

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56. Demonstrate the knowledge and practices that are essential for working safely with electrical equipment and tools and knowledge of testing and tagging procedures to AS 3760.	Essential	NES402bA Test apparatus and circuits— <i>electrical</i> <i>The safe working aspects of this capability are included in the elements of core competency standard units</i>	NBB002.1 Occupational health and safety NE171.1 Electrical installation safety testing NE172.2 Electrical wiring and equipment 1 NE175.1 Workshop practice NUE 044 Electrical safe working practice NEWP402b Test apparatus and circuits - <i>Electrical work performance</i> <i>Included in Work Performance Module for core competency standard unit</i>
57. Describe the method of rescuing a person in contact with live electrical conductors or equipment.	Critical	<i>It is obvious that this capability can only be learnt in a simulated setting. Periodic refresher training/assessment may be considered necessary for some work environments.</i>	NBB002.1 Occupational health and safety NUE 505A Electrical systems safety
58. Describe the emergency first aid requirements for an electric shock victim and demonstrate the knowledge and application skill of EAR and CPR.	Critical	<i>It is obvious that this capability can only be learnt in a simulated setting. Periodic refresher training/assessment may be considered necessary for some work environments.</i>	NBB002.1 Occupational health and safety NUE 505A Electrical systems safety
59. Demonstrate knowledge and understanding of the significant dangers of High Voltage equipment and distribution systems.	Critical	<i>This capability is fundamental to safety and is included in the elements and under the 'Critical aspects of evidence' of core competency standard units</i>	NUE 048.1 Single and three phase transformers NUE 044 Electrical safe working practice NUE 505A Electrical systems safety <i>Included in Work Performance Module for core competency standard unit</i>
60. Describe the types of potential operational situations that may be encountered in various areas of industry, that will require assistance from more experienced industry personnel.	Essential	<i>This capability is fundamental to safety and is included in the elements and under the 'Critical aspects of evidence' of core competency standard units</i>	NUE 044 Electrical safe working practice <i>Included in Work Performance Module for core competency standard unit</i>
61. Describe the type of assistance that may be needed for operational situations that could be encountered in various areas of industry.	Essential	<i>This capability is fundamental to safety and is included in the elements and under the 'Critical aspects of evidence' of core competency standard units</i>	<i>Included in Work Performance Module for core competency standard unit</i>

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62. Describe methods of commissioning and/or decommissioning electrical equipment or an installation, using a systems approach.	Critical	NES301bA Undertake commissioning procedures of apparatus and associated circuits— <i>electrical</i>	NUE 505A Electrical systems safety NEWP301b Undertake commissioning procedures of apparatus and associated circuits - <i>Electrical</i> work performance
63. Describe the functioning of basic electronic circuits used in common electrical power circuit applications including related hazards and safety requirements..	Essential	UTE NES106bA Install Electelectrical/electronic apparatus— <i>electrical</i> UTE NES402bA Test apparatus and circuits— <i>electrical</i> UTE NES501bA Diagnose and rectify faults in apparatus and associated circuits— <i>electrical</i>	NUE 064 Electronic power and control NEWP106b Install electrical/electronic apparatus - <i>Electrical</i> work performance NEWP402b Test apparatus and circuits - <i>Electrical</i> work performance NEWP501b Diagnose and rectify faults in apparatus and associated circuits - <i>Electrical</i> work performance
64. Describe basic control techniques and diagnostic methods for simple DC motor control circuits and applications	Essential		NUE045 Applied electromagnetism NE 32.1 Circuit development 1
65. Demonstrate an understanding of the basic operation of various types of luminaires and the purpose of components and ancillary equipment including related hazards and their safety requirements.	Essential		NE164.1 Lighting
66. Demonstrate the knowledge and skills for diagnosing and rectifying faults in electrical apparatus and associated circuits.	Critical	NES501bA Diagnose and rectify faults in apparatus and associated circuits— <i>electrical</i>	NE163.1 Electric heating NE164.1 Lighting NUE 046 Alternating current machines NUE 048 Single and three phase transformers NUE 505A Electrical systems safety NEWP501b Diagnose and rectify faults in apparatus and associated circuits - <i>Electrical</i> work performance