



Australian Government

Assessment Requirements for MEM10025 Undertake a capstone assessment

Release: 4

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Modification History

Release 4. Prerequisite units updated

Release 3. Minor adjustments to reflect ERAC requirements for electrician licensing and revision of Essential Performance Capabilities

Release 2. Equivalent - correction to include missing prerequisites

Release 1. New unit

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- demonstrating fundamental knowledge and comprehension of electrical concepts and safety principles, using (where possible) problems that test a combination of practical and theoretical skills
- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting circuits, drawings, plans and specifications relevant to the work to be undertaken
- obtaining the necessary tools, equipment and testing devices ensuring that they are checked for safety and operation
- undertaking the necessary calculations in determining current carrying capacity, short circuit capacity, maximum demand and voltage drop and earth loop impedance for the given installation
- selecting cables ensuring coordination between protective devices and conductors in accordance with specifications and regulatory requirements
- selecting and installing suitable switch gear and circuit protection devices complying with specifications and regulatory requirements
- installing and terminating low voltage cabling and wiring; fitting off accessories, appliances and equipment in accordance with specifications and regulatory requirements
- performing a visual inspection ensuring that it meets the requirements of the Australian/New Zealand Wiring Rules – Testing and Verification Visual Inspection Check List
- performing the mandatory and optional circuit tests required for electrical cables in a range of installations and final subcircuits, including:
 - following safe testing procedures
 - testing to show if the earth continuity is sufficiently low
 - testing to show if the insulation resistance is sufficiently high
 - testing to show if the polarity and circuit connections are correct

- testing to show earth fault-loop impedance is sufficiently low
- performing testing to verify that residual current devices (RCDs) operate as intended
- demonstrating how to test a multiple earthed neutral (MEN) system
- identifying and rectifying of any non-compliance defect/s and retesting to ensure compliance
- completing all mandatory documentation in accordance with regulatory and local supply authority requirements
- completing the written component of the capstone assessment in the allocated timeframe
- satisfying the minimum requirements of both the written and practical component of the capstone assessment.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- various effects of electric current
- operation of a simple practical circuit
- determination of resistance, voltage, current and power in any part of a direct current (DC) circuit using theory and actual measurements
- alternating voltage and current generation, phase relationships, energy in an alternating current (AC) circuit and actual measurement methods
- understanding of the scope, application and fundamental principles of AS/NZS 3000: 2007 Electrical installations (known as the Australian/New Zealand Wiring Rules) Part 1
- methods of electric motor selection, starting, connection and protection
- requirements and its application of Australian/New Zealand Wiring Rules in relation to earthing arrangements and fault-loop impedance calculations
- alternate earthing systems when required by local regulatory authorities
- understanding of the MEN system and its application, including on sub-installations
- applications of transformers and key safety issues
- requirements and application of Australian/New Zealand Wiring Rules in relation to circuit protection and other relevant Australian Standards e.g. AS/NZS 3018:2001 Electrical installations – Domestic installations (or its equivalent updated version)
- requirements and application of Australian/New Zealand Wiring Rules in relation to separated extra-low voltage (SELV) and protected extra-low voltage (PELV) systems, their application and testing
- cable selection for mains and submains using Australian/New Zealand Wiring Rules and AS/NZS 3008.1.1:2009 Electrical Installations – Selection of cables – Cables for alternating voltages up to and including 0.6/1 kV – typical Australian installation conditions based on current carrying capacity, short circuit capacity, maximum demand and voltage drop for single-phase and three-phase installations, including multiple installations

- cable selection for final subcircuits using Australian/New Zealand Wiring Rules and AS/NZS 3008.1.1:2009 Electrical Installations – Selection of cables – Cables for alternating voltages up to and including 0.6/1 kV – typical Australian installation conditions based on current-carrying capacity, short circuit capacity, earth loop impedance and voltage drop
- control and protection requirements for installations and equipment and the ability to select suitable equipment, switchgear and RCDs for a particular installation or part of an installation
- minimum fault levels specified by electricity network operator
- requirements and application of Australian/New Zealand Wiring Rules in relation to location of switchboards and arrangement of switchboard equipment in installations
- methods of determining prospective fault current
- switchboard form types
- installation of electrical equipment in given damp situations and wet areas in accordance with Australian/New Zealand Wiring Rules and regulatory requirements
- Ingress Protection (IP) rating of electrical equipment
- installation, modification and testing of electrical installations and equipment for construction and demolition sites complying with AS/NZS 3012:2010 Electrical Installations – Construction and demolition sites, and applicable workplace safety legislation
- need for calibration of instruments
- requirements of Australian/New Zealand Wiring Rules in relation to the installation of aerial conductors, underground wiring and specialist cables
- requirements Australian/New Zealand Wiring Rules in relation for electrical installations in hazardous areas and awareness of the standards to which it refers
- additional training required to work competently with electrical equipment for hazardous areas
- electrical tests and checks to be performed as required by Australian/New Zealand Wiring Rules and AS 3017:2007 Electrical Installations – Verification guidelines to ensure electrical installations are safe
- reporting of test results typically required to satisfy regulatory requirements
- effective safe isolation of any equipment, including capacitor banks, including switch and lock off, circuit isolation, equipment testing and tagging procedures
- installation and termination requirements for a variety of cables in a wide range of applications (including final subcircuits to Australian/New Zealand Wiring Rules
- circuit tests requirements for electrical cables in a range of installations, with attention to final subcircuits
- installation requirements of final subcircuit wiring into switchboards and connection to switchboard equipment in accordance with Australian/New Zealand Wiring Rules and local supply authority requirements
- connection requirements of consumer mains to an installation in accordance with Australian/New Zealand Wiring Rules and local supply authority requirements
- reading, sketching and interpretation of electrical diagrams and specifications

- basic statutory work health and safety (WHS) responsibilities for employers and employees, including supervisory requirements and employees' own 'duty of care', including asbestos awareness and hazardous gases
- requirements for personal safety in the workplace, including safe isolation and application of safety practices
- workplace safety checks, identification of potential workplace hazards and working with others to suggest measures for accident prevention
- method of rescuing a person in contact with live electrical conductors or equipment
- emergency first aid requirements for an electric shock victim and demonstrate the knowledge and application skill of cardiopulmonary resuscitation (CPR)
- understanding of the significant dangers of high voltage equipment and distribution systems
- methods of commissioning and/or decommissioning electrical installation using a systems approach
- diagnosing and rectifying faults in electrical apparatus and associated circuits.

Assessment Conditions

- Assessors must:
 - hold a current electrical licence be an assessor other than the one who has been a regular instructor to the apprentice
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* and comply with the *National Vocational Education and Training Regulator Act 2011* or equivalent legislation covering VET regulation in a non-referring State as the case requires
- The capstone assessment is an entirely RTO conducted assessment at the RTO's chosen location where the entire assessment needs to be carried out in one day.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications.
- 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.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>