



Australian Government

Assessment Requirements for MEM23126 Evaluate industrial robotic applications

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM23126A Evaluate industrial robotic applications.

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:

- identifying work health and safety (WHS), regulatory and risk management compliance requirements, including those related to automation safety
- investigating sustainability implications of robotic applications
- identifying, reviewing and classifying features and functions of robotic applications and robotic devices, robotic principles and techniques, analysis techniques and software
- evaluating robotic hardware
- evaluating robotic motion, load capability, accuracy, precision, efficiency and repeatability on at least two occasions
- evaluating system integration, networking, data sharing, control and human machine interfaces, software and programming, supervisory control and data acquisition (SCADA) or distributed control system (DCS), and system simulation
- applying mock-up or prototyping and virtual techniques for robot and subsystem testing on at least two occasions
- reporting and documenting processes and results of evaluation, including calculations, specifications, diagrams, computer programs and files, and mock-ups or prototypes.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

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:

- compliance requirements of WHS and regulatory requirements, codes of practice, standards and risk management requirements for robotic applications
- classifications and applications of industrial and mobile robotic devices or systems
- features, mechanisms and components of robots
- advantages and disadvantages of different types of actuators for engineering applications
- types of actuator power interfaces
- end effectors and their applications
- robot sensors including:
 - contact, proximity and interrupted beam

- distance sensing
- pressure and temperature
- relative and absolute encoders
- vision and smart cameras
- sensor interface/transducer signal conditioning techniques and analog to digital converter (ADC)
- online and offline programming methods
- mechanical, fluid power, electrical, electronic, programming, communications and networking principles and techniques related to robotics
- role of kinematic and kinetic analysis of robot mechanisms
- analysis of motions, loads, accuracy, precision and repeatability
- situations requiring licensed trade, technical or professional assistance including actuator power interfacing
- interfaces for sensors and actuators, including the use of signal conditioning techniques and ADC, power interfacing and digital to analog converter (DAC), and pulse-width modulation (PWM)
- programming techniques for motion control and load handling with specialist input including vision systems, proximity and distance measurement inputs, and variable velocity control which may be implemented using packaged routines
- automation safety in systems and programs including appropriate use of emergency stop, failsafe design, redundancy, interlocks, guarding and data integrity
- system integration of sensing, control, end effectors and actuators, data requirements, network topology and communication protocols required
- software for simulation, motion analysis, control, digital to analogue converter (DAC) and SCADA
- sustainability implications of industrial robotics.
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Assessment Conditions

- Assessors must:
 - have vocational competency in evaluating industrial robotic applications at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015 or its replacement* and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.

- 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.
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Links

Companion Volume implementation guides are found in VETNet -

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