



Australian Government

Assessment Requirements for MEM14086 Apply mechatronic engineering analysis techniques

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM14086A Apply mechatronic engineering analysis techniques.

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:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- communicating, negotiating and reviewing design brief with stakeholders and team or support functional group
- determining or confirming relevant scientific principles and analysis techniques
- determining or confirming work health and safety (WHS) and regulatory requirements
- evaluating multiple solutions
- investigating life cycle design and sustainability on at least two occasions
- planning, scheduling and coordinating the design task
- integrating mechatronic techniques, hardware and software
- solving problems and making decisions with systems thinking for contingencies, constraints and continuous improvement
- defining analysis
- specifying and documenting and applying analysis techniques
- creating and maintaining adequate and accurate calculations and design process records
- reporting and documenting results on at least two occasions.

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:

- safe work practices and procedures and use of personal protective equipment (PPE)
- reasons and planning processes for mechatronic engineering-related analysis
- implications of life cycle design, fitness for purpose evaluation and sustainability for mechatronic analysis process

- mechatronic analysis processes and techniques to investigate, synthesise and develop proposals, evaluate feasibility against design criteria, and review and revise in consultation with stakeholders, team or support functional group
- common model, mock-up and prototyping techniques relevant to mechatronic engineering
- systems thinking, problem-solving and decision-making and continuous improvement methods
- WHS and regulatory requirements, codes of practice, standards, risk management and registration requirements with particular emphasis on automation safety requirements
- sources of professional and technical assistance
- procedures for planning, scheduling and coordination of analysis
- hardware requirements for typical applications
- engineering mechatronic scientific principles and techniques required for analysis tasks:
 - mechanical
 - fluid power
 - fluid dynamics
 - thermodynamics
 - electrical and electronic fundamentals
 - controller and supervisory control and data acquisition (SCADA) or distributed control system (DCS) programming
 - engineering materials, properties and processes
 - techniques for integration of mechanical, fluid, electrical, electronic, controller and networking elements
- mechatronic analysis calculations techniques
- software for product planning and design including CAD, circuit design, controller programming and project management
- documentation and required information
- prototyping options, including mock-ups, physical and virtual modelling and rapid prototyping.
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Assessment Conditions

- Assessors must:
 - have vocational competency in applying mechatronic engineering analysis techniques 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>