



Australian Government

Assessment Requirements for MEM234025

Apply numerical methods to technology problems

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM234025A Apply numerical methods to technology problems.

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 and defining problems
- identifying appropriate numerical methods for engineering or related problems
- applying the appropriate technique to the problem and solving and confirming answer using the technique on at least two occasions
- communicating the outcome of the analysis in a manner suited to the audience and confirming the outcome has addressed the problem.

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:

- numerical solutions including:
 - finite difference techniques
 - polynomial interpolation
- errors including:
 - computer arithmetic
 - propagation of errors
- solution of non-linear equations including:
 - fixed point and bisection method
 - Secant and Newton-Raphson iterative methods
 - convergence
- solution of systems of linear equations including:
 - Gaussian elimination
 - pivoting strategies
 - LU factorisation
 - Ill-conditioning

- errors and residuals
- iterative methods
- solution of differential equations including:
 - Euler method
 - Taylor and Runge-Kutta methods
 - convergence
- interpolation and approximation including:
 - polynomial interpolation
 - Lagrange form
 - Newton's divide formula
 - error bound
- finite difference techniques including:
 - solution of problems in electrostatics and wave propagation
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Assessment Conditions

- Assessors must:
 - have vocational competency in applying numerical methods to technology problems 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 available on VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>