



Australian Government

Assessment Requirements for MEM234023

Apply differential equations to technology problems

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM234023A Apply differential equations 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 differential equations 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:

- ordinary differential equations (DEs)
- first order separable DEs
- first order linear DEs
- first order exact DEs
- second order linear homogeneous DEs with constant coefficients
- second order linear non-homogeneous DEs with constant coefficients
- DEs including:
 - definition of a DE

- first order DEs – separation of variables and applications
- second order DEs of the form:

$$\frac{d^2 y}{dx^2} = f(x)$$
- second order DEs of the form:

$$\frac{d^2 y}{dx^2} = f(y)$$
- first order DEs of the form:

$$\frac{dy}{dx} + Py = Q$$
- second order DEs of the form:

$$a \frac{d^2 y}{dx^2} + b \frac{dy}{dx} + cy = 0$$
- second order DEs of the form:

$$a \frac{d^2 y}{dx^2} + b \frac{dy}{dx} + cy = f(x)$$
- motion
- kinematics
- resisted gravitational motion
- simple harmonic motion
- vibratory motion.

Assessment Conditions

- Assessors must:
 - have vocational competency in applying differential equations 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.

Links

Companion Volume Implementation Guides are available on VETNet -

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