



**Australian Government**

# **MEM234024 Apply advanced mathematics to technology problems**

**Release: 1**

# MEM234024 Apply advanced mathematics to technology problems

## Modification History

Release 1. Supersedes and is equivalent to MEM234024A Apply advanced mathematics in technology problems.

## Application

This unit of competency defines the skills and knowledge required to apply advanced mathematics in an engineering or related application and includes a range of mathematical techniques. It covers both the application of theory in simple calculations either manually or through the use of relevant software packages for more complex situations.

It is suitable for paraprofessionals and technologists required to solve advanced mathematical problems in an engineering or related field, or for those pursuing technologist careers and qualifications.

Individuals completing this work either already have or are developing skills and experience in mathematics.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

## Pre-requisite Unit

Nil

## Competency Field

Engineering science

## Elements and Performance Criteria

| Elements                                                       | Performance Criteria                                                                                                                                                                                                                   |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i>               | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                 |
| 1. Identify a need for the application of advanced mathematics | 1.1 Identify and define a problem requiring application of mathematics<br>1.2 Determine data currently available for analysis<br>1.3 Identify ways of obtaining other required data<br>1.4 Determine information required from outcome |
| 2. Prepare to solve problem by advanced                        | 2.1 Determine appropriate mathematics to be applied                                                                                                                                                                                    |

| Elements                                         | Performance Criteria                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i> | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                                                                                                  |
| mathematics                                      | 2.2 Identify and gain access to appropriate computational devices<br>2.3 Collect required input data<br>2.4 Analyse collected data for suitability and completeness<br>2.5 Take appropriate action to address any deficiencies found                                                                                    |
| 3. Solve problem using advanced mathematics      | 3.1 Apply appropriate techniques to collected data<br>3.2 Check answer to ensure it is within the expected rational results<br>3.3 Interpret answer to determine information required by problem definition and translate the result of the statistical analysis into a form which is useable by relevant stakeholders. |
| 4. Communicate outcomes                          | 4.1 Communicate outcome to relevant stakeholders by appropriate means<br>4.2 Explain outcome to stakeholders as appropriate<br>4.3 Confirm that the result of the analysis assists in the resolution of the problem                                                                                                     |

## Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

## Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

|                                      |                                                                                                                                            |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Mathematics includes one or more of: | <ul style="list-style-type: none"> <li>the techniques listed under Knowledge Evidence</li> <li>a related technique.</li> </ul>             |
| Computational devices include:       | <ul style="list-style-type: none"> <li>calculators with appropriate mathematical functions</li> <li>computer software packages.</li> </ul> |
| Appropriate action                   | <ul style="list-style-type: none"> <li>taking necessary steps to obtain required data</li> </ul>                                           |

|                                                                  |                                                                                                                                                                                                                             |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| includes:                                                        | <ul style="list-style-type: none"><li>• obtaining some relevant proxy for the desired data</li><li>• choosing a different mathematical and computational device which will function with available data.</li></ul>          |
| Appropriate techniques include:                                  | <ul style="list-style-type: none"><li>• selected mathematical technique which will yield required outcome</li><li>• a technique which is appropriate for the available data and which is relevant to the problem.</li></ul> |
| Appropriate communication includes one or more of the following: | <ul style="list-style-type: none"><li>• report</li><li>• presentation</li><li>• verbal communication</li><li>• web-based</li><li>• electronic or hard copy.</li></ul>                                                       |

## Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM234024A Apply advanced mathematics in technology problems.

## Links

Companion Volume Implementation Guides are available on VETNet -

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