



Australian Government

MEM23109 Apply engineering mechanics principles

Release: 1

MEM23109 Apply engineering mechanics principles

Modification History

Release 1. Supersedes and is equivalent to MEM23109A Apply engineering mechanics principles.

Application

This unit of competency defines the skills and knowledge required to apply the principles of mechanics and strength of materials to devices, machines and systems and their components, to identify key mechanical properties. It includes a range of basic analyses of static and dynamic loads and moments, stresses and deflections, velocities and accelerations.

The unit applies to engineering or related activities requiring the application of the principles of mechanics and strength of materials and is suitable for people giving technical support to design, operations or maintenance activities and those pursuing technical qualifications and careers at paraprofessional or technician level.

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

Pre-requisite Unit

MEM23004 Apply technical mathematics

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 scope of required analysis	1.1 Identify device, machine or system, and component parts for analysis 1.2 Assess engineering mechanics principles, skills and techniques required by tasks 1.3 Review functions and features of device, machine or system 1.4 Assess software techniques required for basic analysis and graphics required by the task 1.5 Identify stakeholders to be consulted on analysis tasks

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.6 Confirm work health and safety (WHS) and regulatory requirements, and risk management and organisational procedures 1.7 Review sustainability implications of tasks 1.8 Determine available sources for technical and professional assistance
2. Apply engineering mechanics principles and techniques	2.1 Identify appropriate engineering mechanics principles and analytical, graphical and software-assisted techniques applicable to task 2.2 Validate software results using analytical and graphical methods 2.3 Ensure clear and logical process of analysis and compatibility of units in calculations 2.4 Apply resultant loads and reactions on machines, support frames and beams due to parallel and oblique, concentrated and distributed loads and moments 2.5 Apply the torque and power required to drive translation screws and winding drums against inclined and vertically suspended loads subject to gravitation, acceleration and friction resistance loads 2.6 Select standard hardware to meet specifications 2.7 Analyse bending and shear stresses in beams subject to static point and distributed loads
3. Report results	3.1 Record results of investigation, evaluation and application 3.2 Provide documentation including calculations, diagrams, programs and files

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.	
Motion is 2D plane motion only and includes one or more of the following:	• constant velocity • constant acceleration • sinusoidal accelerations (sprung bodies) • other non-uniformly accelerated motions.
Appropriate licensed technical and professional assistance includes one or more of the following:	• technical support and advice relating to elements which have intrinsic dangers • professional support for technologies.
WHS, regulatory requirements and enterprise procedures include:	• WHS acts and regulations • relevant standards • codes of practice from Australian and overseas engineering and technical associations and societies • risk assessments • registration requirements • safe work practices • state and territory regulatory requirements.
Analysis includes:	• static and dynamic analysis of loads • the stresses and deformations resulting • the transmitted power, torque and speed • graphical and mathematical methods and software options.

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Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM23109A Apply engineering mechanics principles.

Links

Companion Volume implementation guides are found in VETNet -

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