



Australian Government

MEM09010 Create 3-D models using computer-aided design system

Release: 1

MEM09010 Create 3-D models using computer-aided design system

Modification History

Release 1. Supersedes and is equivalent to MEM09010C Create 3D models using computer aided design system

Application

This unit of competency defines the skills and knowledge required to prepare the 3-D computer-aided design (CAD) environment, create and modify 3-D models, and produce output from the 3-D model using computer equipment and industrial software. It applies to the fields of mechanical, electrical or electronic, fabrication and fluid power.

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

Band: B

Unit Weight: 4

Pre-requisite Unit

MEM09002	Interpret technical drawing
MEM09009	Create 2-D drawings using computer-aided design system
MEM12023	Perform engineering measurements
MEM12024	Perform computations
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM16008	Interact with computing technology

Competency Field

Drawing, drafting and design

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|---|--------------------------------------|-----|---|
| 1 | Determine job requirements | 1.1 | Follow standard operating procedures (SOPs) |
| | | 1.2 | Comply with work health and safety (WHS) requirements at all times |
| | | 1.3 | Identify job requirements from specifications, job sheets or associated work instructions |
| | | | |
| 2 | Prepare 3-D environment | 2.1 | Establish coordinate system to meet job requirements |
| | | 2.2 | Establish orientation and views |
| | | | |
| 3 | Create and modify 3-D model | 3.1 | Create and manipulate entities in 3-D space |
| | | 3.2 | Create surfaces in 3-D space to job requirement, including ruled and revolved |
| | | 3.3 | Modify existing 3-D model |
| | | | |
| 4 | Produce output from 3-D model | 4.1 | Save file in various formats for retrieval in accordance with SOPs |
| | | 4.2 | Extract physical properties to job requirement |

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

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.

Entities include one (1) or more of the following:

- arcs
- lines
- spheres
- cones
- cylinders
- boxes

Physical properties include the following:

- volume
- mass
- centre of gravity

Unit Mapping Information

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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>

Assessment Requirements for MEM09010 Create 3-D models using computer-aided design system

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- preparing computer-aided design system (CAD) to create 3-D models, including establishing coordinate system, orientation and views to specifications and job requirements
- creating and modifying 3-D models using CAD by creating and manipulating entities in 3-D space, creating ruled and revolved surfaces and modifying existing 3-D model to suit job requirements
- undertaking numerical operations, geometry and calculations or formulae associated with creating 3-D models using CAD system
- producing and saving files in various formats for retrieval and extracting physical properties to meet job requirements.

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
- purpose for which the 3-D model is to be developed
- reasons for selecting the appropriate coordinate system for the job
- orientation of the model with respect to the coordinate system
- number of views required to establish the model
- procedures for:
 - creating and manipulating entities in 3-D space
 - modifying existing 3-D models
 - saving drawing files
 - extracting data with respect to the physical properties of shapes created in 3-D space
- entities that can be created and manipulated in 3-D space
- applications and procedures for creating ruled and revolved surfaces in 3-D space

- various formats in which drawing files can be saved and reasons for using different formats when saving drawing files
- physical properties of shapes created in 3-D space that can be extracted from the drawing file.

Assessment Conditions

- Assessors must:
 - have vocational competency in creating 3-D models using computer-aided design system 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. This must 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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