



Australian Government

MEM09210 Create 3D solid models using computer-aided design (CAD) system

Release: 1

MEM09210 Create 3D solid models using computer-aided design (CAD) system

Modification History

Release 1. Supersedes and is equivalent to MEM09210A Create 3-D solid models using computer-aided design (CAD) system.

Application

This unit of competency defines the skills and knowledge required to create 3D solid models using a computer-aided design (CAD) system. It includes applications in CAD, computer graphics and animation, rapid prototyping, medical testing and visualisation of scientific research.

This unit covers the set up and manipulation of CAD software to produce 3D solid models and includes the use of region and solid modelling techniques, section views, and pre-drawn library files, extraction of properties and application of basic rendering techniques.

This unit is suitable for those working within a drafting work environment and can be applied across all engineering disciplines.

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

Pre-requisite Unit

MEM09229 Read and interpret technical engineering drawings

MEM30031 Operate computer-aided design (CAD) system to produce basic drawing elements

Competency Field

Drawing, drafting and design

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. Determine solid modelling requirements	1.1 Follow standard operating procedures (SOPs) and comply with work health and safety (WHS) requirements at all times 1.2 Check purpose, scope and information requirements for modelling task

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.3 Interpret available information relevant to job requirements, and identify and address further information needs 1.4 Identify and prepare resources required to complete work 1.5 Identify and consult with appropriate personnel
2. Prepare 3D environment	2.1 Apply workplace procedures to retrieve and manipulate required information and navigate computing technology 2.2 Set up a 3D environment to allow multiple viewing 2.3 Create 3D views on the screen by manipulating drawing planes and inserting 3D geometric shapes 2.4 Establish work planes and orientation according to job requirements 2.5 Determine and exploit key features of solid modelling software package
3. Produce output from 3D model	3.1 Perform drawing for solid modelling 3.2 Exploit features of modelling software to improve productivity 3.3 Extract physical properties to job requirements, including volume, mass and centre of gravity 3.4 Apply rendering techniques 3.5 Produce 3D drawings incorporating section views with all necessary annotation
4. Complete CAD operations	4.1 Confirm model accurately reflects specifications, is presented according to work requirements and contains all relevant information 4.2 Save and file drawing elements according to organisational procedures 4.3 Evaluate work and identify areas for improvement 4.4 Close applications, perform CAD housekeeping and maintain organisational filing system in accordance with SOPs

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.

Solid modelling includes one or more of the following:	• region modelling • solid modelling • parametric modelling • composite models • section models • 3D primitives • mass and area properties • rendering techniques • material finishes • production of hard copies • saving and retrieval of files of varying formats • consolidation.
Resource requirements include one or more of the following:	• computer software • stationery • software reference documentation • reference texts • consumables • computer • printing equipment.
Appropriate personnel include one or more of the following:	• supervisor • leading hand • foreman • manager • site engineer • mentor • other team members relevant to the project.
Rendering techniques include one or more of the following:	• rendering types and preferences • render lighting techniques • views and scenes.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM09210A Create 3-D solid models using computer-aided design (CAD) system.

Links

Companion Volume implementation guides are found in VETNet -

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