



Australian Government

Department of Education, Employment and Workplace Relations

MEM09010C Create 3D models using computer aided design system

Release: 1

MEM09010C Create 3D models using computer aided design system

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing the 3D CAD environment, creating and modifying 3D models, and producing output from the 3D model.
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Application of the Unit

Application of the unit	<p>This unit applies to the production of 3D models utilising computer equipment. Operations at this level include, but are not limited to, the creation and manipulation of entities such as arcs and lines and primitives such as spheres, cones, cylinders and boxes using industrial software. The unit applies to the fields of mechanical, electrical/electronic, fabrication, and fluid power.</p> <p>Band: B</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM09009C	Create 2D drawings using computer aided design system

Prerequisite units		
	MEM16008A	Interact with computing technology

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare 3D environment	1.1. Coordinate system is established to job requirement. 1.2. Orientation is established to job requirement. 1.3. Views are established to job requirement.
2. Create and modify 3D model	2.1. Entities are created in 3D space to job requirement. 2.2. Entities are manipulated in 3D space to job requirement. 2.3. Surfaces are created in 3D space to job requirement including ruled and revolved. 2.4. Existing 3D model is modified to job requirement.
3. Produce output from 3D model	3.1. File is saved in various formats for retrieval as per standard operating procedures. 3.2. Physical properties are extracted to job requirement including volume, mass and centre of gravity.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: <ul style="list-style-type: none">• obtaining relevant job instructions, specifications, etc.• creating the appropriate entities in 3D space• manipulating the entities in 3D space• creating ruled and revolved surfaces in 3D space• modifying, where appropriate, existing 3D models• saving drawing files in the appropriate format• extracting the physical properties of shapes created in 3D space from the drawing file to meet job requirements• reading, interpreting and following information on written job instructions, specification, standard operating procedures, charts, lists, drawings and other applicable reference documents• checking and clarifying task related information• checking for conformance to specifications• undertaking numerical operations, geometry and calculations/formulae within the

REQUIRED SKILLS AND KNOWLEDGE

scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- purpose for which the 3D model is to be developed
- appropriate coordinate system for the job
- reasons for selecting the chosen coordinate system
- orientation of the model with respect to the coordinate system
- number of views required to establish the model
- procedures for creating entities in 3D space
- the entities that can be created/manipulated in 3D space
- procedures for manipulating entities in 3D space
- procedures for creating ruled and revolved surfaces in 3D space
- applications of ruled and revolved surfaces
- procedures for modifying existing 3D models
- procedures for saving drawing files
- the various formats in which drawing files can be saved
- reasons for using different formats when saving drawing files
- procedures for extracting data with respect to the physical properties of shapes created in 3D space
- the physical properties of shapes created in 3D space that can be extracted from the drawing file
- hazard and control measures associated with using computer aided design system, including housekeeping
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

A person who demonstrates competency in this unit must be able to create 3D models using computer aided design systems. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Context of and specific resources for assessment

This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with creating 3D models using computer aided design systems or other units requiring the exercise of the skills and knowledge covered by this unit.

Method of assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE**Guidance information for
assessment****Range Statement****RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Drawing, drafting and design
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