Australian Government

Department of Education, Employment and Workplace Relations

MEM30004A Use CAD to create and display 3D models

Release: 1

MEM30004A Use CAD to create and display 3D models

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers using a CAD program to produce and plot basic three dimensional view drawings.

Application of the Unit

Application of the unit	This unit applies to the production of three dimensional models using computer aided design and drawing software and associated equipment. This will include the use of region and solid modelling techniques, section views, and pre-drawn library files. Work also includes extraction of properties and application of basic rendering techniques. All work is conducted under supervision. **Band**: **0** **Unit Weight**: **0**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM16006A	Organise and communicate information
	MEM16008A	Interact with computing technology

Prerequisite units		
	MEM30001A	Use computer aided drafting systems to produce basic engineering drawings

Employability Skills Information

Employability skills	This unit contains employability skills.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Set up a three dimensional environment	1.1. Set up a three dimensional environment on the screen to allow multiple viewing.
2. Create three dimensional views	2.1. Three dimensional views are created on the screen by manipulation of drawing planes and insertion of three dimensional geometric shapes. 2.2. Any plane of the three dimensional view is drawn on. 2.3. Editing functions are used to modify three dimensional geometric shapes in creating three dimensional views.
3. Display three dimensional views	3.1. Wire line, surface and solid face displays are produced in isometric, perspective and orthographic projections.
4. Extract mass and area properties of a 3D model	4.1. The mass and surface area of a given solid model made from a nominated material is extracted.
5. Apply basic rendering techniques to a 3D model	5.1. A solid model is rendered to a specified set of criteria.
6. Save completed drawing file in various formats	6.1. File is saved in an appropriate format to enable retrieval and use in a CAD system. 6.2. File is saved in other formats to enable retrieval in other software applications.

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: • reading and interpreting engineering specifications • organising information • using computer and peripherals

REQUIRED SKILLS AND KNOWLEDGE
• using CAD program • saving 3D modes in various file formats • preparing drawings in plane orthogonal, isometric projection or equivalent
Required knowledge
Look for evidence that confirms knowledge of: • region modelling techniques. • solid modelling techniques • development of sectioned models • use of cutting plane • use of cross hatching • use of pre-drawn library files and primitives to produce a 3D model • use of third level software to produce 3D models • how to extract mass and area properties • how to extract area properties from region models • application of basic rendering techniques to a 3D model

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 use CAD to create and display 3D models. 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 using CAD to create and display 3D models 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.	
Multiple viewing	Includes top views, front and side views, and a general three dimensional view
Three dimensional geometric shapes	May include arcs and lines, spheres, cones, cylinders and boxes

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Engineering technician