



Australian Government

MEM19024 Use computer-aided design (CAD) to create and display 3D jewellery or object models

Release: 1

MEM19024 Use computer-aided design (CAD) to create and display 3D jewellery or object models

Modification History

Release 1. Supersedes and is equivalent to MEM19024A Use CAD to create and display 3D jewellery and object models.

Application

This unit of competency defines the skills and knowledge required to use CAD software and equipment to produce 3D drawings of jewellery or object models. Drawings can be used to generate and document designs and inform production of jewellery or objects and incorporate standard practice notations and drawing protocols.

This unit applies to individuals involved in jewellery or object design or manufacture in a small or large-scale production context. They use and adapt technical knowledge and skills to produce work.

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

Band: A

Unit Weight: 4

Pre-requisite Unit

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

Competency Field

Jewellery

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 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

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
2. Prepare for drawing	2.1 Examine sketches, drawings and other information to confirm calculations and measurements 2.2 Select and prepare computing equipment and suitable software for jewellery or object designs
3. Use CAD applications to produce 3D model and documentation	3.1 Set up a 3D environment on the screen to allow multiple viewing 3.2 Use editing tools to create features and dimensions of jewellery or object 3.3 Manipulate drawing planes and shapes to create 3D view of jewellery or object 3.4 Produce isometric, perspective and orthographic projections 3.5 Extract mass and area properties of jewellery or object model 3.6 Use principles of perspective to enhance the spatial illusion of jewellery or objects in space 3.7 Apply basic rendering techniques to 3D model of jewellery or object 3.8 Apply drawing protocols and problem solving to refine and document drawing features
4. Save and back up files	4.1 Determine presentation for jewellery or object drawings based on project needs 4.2 Save and file drawings to allow easy access according to workplace documentation system

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.	
Specifications include one or more of the following:	• drawings • job sheets • work instructions.
Design features include one or more of the following:	• materials • dimensions • colours • shapes.
Multiple viewing includes one or more of the following:	• top views • front and side views • general 3D view.
Shapes include one or more of the following:	• arcs and lines • spheres • cones • cylinders • boxes.
Rendering includes one or more of the following:	• the pictorial representation of aspects and perspectives • use of colours, highlighting and shading to provide depth and photo-like effects.
Drawing protocols include one or more of the following:	• commonly-used symbols • lettering standards • standard units of measurement • scale • numbering • legends • abbreviations.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM19024A Use CAD to create and display 3D jewellery and object models.

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 MEM19024 Use computer-aided design (CAD) to create and display 3D jewellery or object models

Modification History

Release 1. Supersedes and is equivalent to MEM19024A Use CAD to create and display 3D jewellery and object models.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- demonstrating computer-aided design (CAD) techniques to create and display features of jewellery or object design features on at least two occasions
- producing 3D CAD models of jewellery or object designs on at least two occasions from single, two and three-point perspectives including multiple views, shapes and rendering
- applying drawing protocols including commonly used symbols, lettering standards, standard units of measurement, scale, numbering, legends and abbreviations
- undertaking numerical operations and calculations to complete measurements, calculate area and volume and estimate other material requirements
- saving and backing up files in accordance with procedures.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

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
- elements and principles of design
- terminology and symbols used in drawings and CAD software
- types of computer-aided manufacturing (CAM) equipment and procedures for their safe use, operation and maintenance
- computer programs and CAD applications
- drafting and drawing codes, protocols and practices relevant to jewellery or object design
- 2D and 3D drawing and rendering techniques
- appropriate mathematical procedures for estimation and measurement
- documentation control procedures
- problem identification and resolution techniques
- jewellery or object design, features, shapes and construction techniques

- rendering applications and techniques and tools for the creation of illustration effects
- region and solid modelling techniques
- development of sectioned models
- use of cutting plane and cross hatching
- use of pre-drawn library files and primitives to produce 3D models
- use of third level software to produce 3D models
- how to extract mass and area properties from region models
- application of basic rendering techniques to a 3D model.
-

Assessment Conditions

- Assessors must:
 - have vocational competency in using CAD to create and display 3D jewellery or object models 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.
-

Links

Companion Volume implementation guides are found in VETNet -

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