



Australian Government

Department of Education, Employment and Workplace Relations

MEM09143A Represent aeronautical engineering designs

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit of competency covers the skills and knowledge required to represent the design of aeronautical engineering products, processes, systems or services using appropriate graphical techniques, specifications and documentation. Work would typically be carried out as part of a design or engineering support team.

Application of the Unit

Competency in this unit includes contribution to the full design process by the creation of documentation, graphics and specifications representing products, processes, systems or services in support of the planning and design processes within aeronautical engineering. Graphics may be produced using manual or computer-aided design (CAD) software and techniques.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEM16008A	Interact with computing technology
MEM30007A	Select common engineering materials
MEM30012A	Apply mathematical techniques in manufacturing, engineering or related situations

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

1	Clarify product, process, system or service design requirements	1.1	Discuss and clarify the design specification of the required product, process, system or service with the client and design team
2	Apply graphical techniques to produce the initial product, process, system or service design representation	2.1	Ensure the initial graphical representation satisfies the design specification, manufacturing and operational requirements, safety and related standards
		2.2	Perform engineering calculations and use engineering references, standards and codes appropriately to determine dimensions, limits and fits, surface textures, datum references and geometric tolerances
		2.3	Identify materials, manufacturing methods and processes for initial design representation
		2.4	Prepare initial production graphics, specifications, and operating and maintenance instructions/manuals in accordance with the agreed design concept and organisational requirements using chosen graphical techniques
3	Validate the product, process, system or service representation	3.1	Confirm suitability of the product, process, system or service design graphical representation with the client, other team members and organisational requirements
4	Develop, validate, implement and file design graphics and specifications and procedural documentation	4.1	Prepare design graphics, specifications and instructions for the product, process, system or service in accordance with the agreed design concept and organisational requirements, and incorporate feedback on initial design graphics and documents
		4.2	Check production graphics, specifications and instructions for the product, process, system or service with the client, design team and other affected persons for suitability prior to implementation
		4.3	Respond to implementation installation and commissioning feedback in accordance with organisational requirements
		4.4	Maintain validated production graphics, specifications

			and instructions for the product process, system or service throughout the implementation, installation and commissioning processes, and process and file in accordance with organisational requirements
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Required Skills and Knowledge

Required knowledge includes:

- the procedures for collaborating with the client and other staff in the selection of the preferred option
- significance of graphical representations of designs in terms of procedural requirements, design objectives and client or contractual requirements
- relevant manufacturing and operational requirements, safety and related standards
- the functional operation of the component/assembly to be drawn
- surfaces that are to be in contact or separated
- the appropriate type of fit for contacting surfaces, and reasons for selecting the chosen type of fit
- the effect of surface finish on the performance/operation of surfaces
- appropriate datum points
- procedures for determining tolerances
- design functional specification
- choice of components, materials, methods and processes in terms of the range of options available and the manner in which the design specification is satisfied
- options for graphical methods of representation
- scientific principles and mathematical techniques underpinning design element choices and decisions
- required graphical representation procedures for the preparation of production drawings, specifications and operating and maintenance instructions/manuals
- clients and other people affected by the design
- organisational procedures and required communication techniques
- organisational requirements for the preparation of production drawings, specifications and operating and maintenance instructions/manuals for products and systems
- persons to be consulted and procedures for verifying and implementing production graphics, technical specifications and operational and maintenance instructions/manuals
- worksite procedures for acting on implementation, installation and commissioning feedback
- worksite procedures for the processing and filing of production graphics, specifications and operating and maintenance instructions/manuals
- file storage and archiving procedures

Required skills include:

- using appropriate communication skills for contacting and confirming specifications with the client
- discussing the alternative options and their relative strengths and weaknesses with the client and selecting the most acceptable option chosen
- applying graphical techniques correctly
- addressing design specifications, manufacturing and operational requirements, safety and related standards appropriately in the initial graphical representations
- presenting graphical representations the dimensions, limits and fits, tolerances and surface

- textures, datum references and geometry tolerances as determined by design calculations and in accordance with engineering references, standards and codes
- producing initial graphical representation and documentation materials, manufacturing methods and processes and design functional specifications sufficient for client, design team and interested party consultation and validation
 - producing initial graphical representation/s to organisational requirements using suitable graphical techniques
 - producing initial production graphics, technical specifications and operational and maintenance instructions/manuals in accordance with worksite procedures and client needs
 - using appropriate communication skills in confirming that the design graphical representation meets the needs of the client and the expectations of other team members and interested parties
 - completing organisational procedures and sign-off documentation
 - preparing production graphics, specifications and instructions in accordance with the agreed design concept and organisational requirements and incorporating feedback on initial design graphics
 - contacting the client, design team and other affected persons and the production graphics, technical specifications and verifying operational and maintenance instructions/manuals prior to implementation
 - incorporating feedback from the implementation, installation and commissioning phases into final graphics and specifications
 - processing, filing and saving all graphics, specifications, instructions and related documentation in correct format and location in accordance with worksite procedures

Evidence Guide

<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to represent the design of aeronautical engineering products, processes, systems or services for a range of general engineering applications. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p> <p>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</p>

	and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
Context of and specific resources for assessment	<p>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.</p> <p>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.</p>
Method of assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with represent the design of aeronautical engineering products, processes, systems or services or other units requiring the exercise of the skills and knowledge covered by this unit.
Guidance information for assessment	

Range Statement

Graphical representation	<p>Graphical representations may include:</p> <ul style="list-style-type: none"> • manual or CAD software and techniques, such as: <ul style="list-style-type: none"> • sketching and layout techniques • reading • interpreting drawings • documentation and design briefs • use of organisation protocols for graphics development • use of industry standards and codes of practice • multimedia presentation techniques • basic software customisation techniques • 3D and orthographic techniques • basic file management techniques
Design graphics, specifications and instructions	<p>Design graphics, specifications and instructions may include:</p> <ul style="list-style-type: none"> • those prescribed within the organisation's policies and procedures • those required by relevant statutory regulations and requirements

Unit Sector(s)

Drawing, drafting and design

Custom Content Section

Not applicable.