



Australian Government

MEM09158 Perform mechatronics engineering design drafting

Release: 1

MEM09158 Perform mechatronics engineering design drafting

Modification History

Release 1. Supersedes and is equivalent to MEM09158A Perform mechatronics engineering design drafting.

Application

This unit of competency defines the skills and knowledge required to use computer-aided design (CAD) software and other drafting techniques to perform mechatronics engineering design drafting in the mechatronic engineering, manufacturing engineering and other industry sectors. It includes the application of conventions and graphical techniques to inform production of fully detailed drawings of mechatronic components and assemblies.

This unit is suitable for people working in design drafting and includes supervision of detailed drawing production and managing of requests for further information from detailed draftspersons.

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

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. Clarify the design drawing task	1.1 Determine the requirements of the design drawing brief received from the designer 1.2 Check and modify information to meet design criteria 1.3 Confirm accuracy of modified information with the designer 1.4 Confirm software and file formats to be used with designer and detail draftspersons 1.5 Confirm design drawing brief and provide preliminary advice on feasibility
2. Prepare for drawing production	2.1 Determine stakeholders to be consulted in design drawing process 2.2 Access required reference documents 2.3 Assess and determine work health and safety (WHS), regulatory and

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	sustainability issues relevant to design task 2.4 Determine range of engineering drawings required
3. Produce mechatronic related drawings	3.1 Produce orthogonal drafting of mechatronic components and assemblies to standards using computer graphical techniques 3.2 Produce 3D images of mechatronic components and assemblies to standards using computer graphical techniques 3.3 Determine and apply required dimensioning, symbols and other graphical convention information appropriate to mechatronic engineering applications 3.4 Produce graphical representations and circuit diagrams for fluid, electrical and electronic control systems in accordance with the design brief 3.5 Obtain required licensed, technical and professional assistance to clarify design information 3.6 Confirm final graphical representations with professional engineering staff and other stakeholders
4. Provide and supervise final documentation	4.1 Submit final design drawings for sign-off by specified authority 4.2 Prepare CAD files for export to detailer 4.3 Provide and store documentation and clearances according to job requirements and enterprise drawing management system and procedures 4.4 Follow organisational processes to supervise production of detail drawings

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.	
Stakeholders include one or more of the following:	• team members • cross-function support groups • experts • appropriate licensed technicians and professionals.
Designers include one or more of the following:	• professional engineer • scientist • engineering technologist • architect • person with appropriate skills and knowledge for the design task • team of designers.
Design drawing brief communicated to the design draftsman includes:	• major and critical engineering specifications (dimensions, limits, fits, tolerances and materials) • standards that must be adhered to Plus one or more of the following: • required features and performance of equipment (volume, temperature and flow) • control requirements and control methods • electrical and fluid power specifications • client requests • budget and project schedule • procedures to be followed for further clarifications.
Drawings include one or more of the following:	• sketches • application of national and international codes and drawing standards • 3D and 2D files • hard copies.
Design criteria for mechatronic designs includes:	• function • manufacturability and maintainability Plus one or more of the following: • aesthetics • marketability • sustainability: • social, economic and environmental • material and energy resources • cost constraints • ergonomics, anthropometrics and physiology • facilities, plant and skills available • automation safety and risk.

Graphical techniques include one or more of the Includes:	• orthogonal modelling • 2D modelling • 3D modelling • isometric perspective Plus one or more of the following: • mechanical perspective • schematics • dimensioning • limits and fits • welding symbols • other standard symbols.
Appropriate licensed technical and professional assistance include one or more of the following:	• technical support and advice relating to elements which have intrinsic dangers including: • high pressure • energised fluid vessels • high temperatures and heat energy capacity • wiring with high current control voltages above extra low voltage • professional support for technologies includes: • specialist electric motor drives and controllers • specialist materials, plastics, metal alloys and nano materials • special processes, foundry, alloy welding, heat treatment, sealing and fastening.
Mechatronic components and features represented by standard conventions and graphical techniques include one or more of the following:	• hole basis, shaft basis and keyway tolerances and fits • dimensioning, tolerancing for limits and fits • materials and surface finish • weld symbols • webs, cross-sections and cutting planes • chain drives, gear sets, pulley and belt drives • threads, fasteners and springs • shafts, keyways and splines • structural sections • surface finishes and welds • electric motors and fluid power actuators • electrical, electronic, electro fluid controls • electrical and electronic circuit components • other mechatronic components and features specified by the designer.
Mechatronic assemblies include one or more of the following:	• robots • automated mechanisms and machines • fan, ventilation, air conditioning service and ducting

	• manufacturing plant and process layouts • manufactured product with embedded controller • automated machines, drives and transmissions • handling equipment including belt conveyors, augers and pneumatic conveyors • guards, handrails and platforms for automated systems • automated fan, ventilation and air conditioning systems • automated manufacturing plant and process layouts • mechatronic devices and products and their component parts.
Documentation includes one or more of the following:	• computer library files • reference charts • catalogue information • drawings • orthogonal images • hard copies.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM09158A Perform mechatronics engineering design drafting.

Links

Companion Volume implementation guides are found in VETNet -

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