



Australian Government

MEA701 Produce aeronautical engineering related graphics

Release: 2

MEA701 Produce aeronautical engineering related graphics

Modification History

Release 2. Equivalent to MEA701 Produce aeronautical engineering related graphics with amended prerequisite codes.

Application

This unit of competency applies to aircraft structure and to aircraft systems products, projects, and related system modifications. It is suitable for people working in aeronautical related design, drafting and maintenance support at the paraprofessional level.

The unit covers the application of graphical techniques for aeronautical engineering related purposes. Graphics techniques include sketching, computer graphics and the application of drawing standards.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA162	Write aviation technical publications
MEM30007A	Select common engineering materials
MEM30012A	Apply mathematical techniques in manufacturing, engineering or related situations

Competency Field

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Review the fundamentals of engineering graphics for aeronautical applications	1.1	Review uses for aeronautical graphics
	1.2	Review engineering drawing standards
	1.3	Review graphical imaging or modelling techniques and conventions

- 1.4 Review conventional representations of structure and of mechanical, hydraulic and pneumatic features and components, including related electrical and electronic control circuits
- 1.5 Review computer-aided design (CAD) and other related software for currency and relevance
- 1.6 Check and determine relevance of work health and safety (WHS) and regulatory requirements, codes of practice, risk assessment and registration requirements for graphical representation tasks
- 1.7 Confirm the availability and features of a range of standards related to aircraft structure and aeronautical system and component design, maintenance and modification
- 1.8 Review typical criteria for aeronautical designs
2. Apply aeronautical graphics
 - 2.1 Determine engineering graphics required by aeronautical applications
 - 2.2 Apply relevant standards
 - 2.3 Represent aircraft structure and aeronautical components and systems with sketching and computer graphical techniques, including orthogonal, three-dimensional imaging, wiring diagrams, circuit diagrams and system schematic drawings
 - 2.4 Determine and apply required dimensioning, tolerancing for limits and fits, surface finish, weld symbols, electrical, electronic and other required graphical convention information appropriate to aeronautical engineering applications
 - 2.5 Seek technical and professional assistance or clarification of design information as required
 - 2.6 Confirm final graphical representations with professional engineering staff and other stakeholders, including making any required adjustments
 - 2.7 Engage appropriate licensed technical and professional assistance for advice as required

- | | |
|--|---|
| 3. Provide final drawings, files and documents | 3.1 Provide documentation, graphics, data files and clearances according to job requirements and regulatory and enterprise drawing management system and procedures |
|--|---|

Foundation Skills

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.

Criteria for aeronautical designs include:

- Function
- Design authority regulatory requirements
- Aircraft design specifications
- Application of configuration management (CM) and/or integrated logistic support (ILS) requirements

Configuration management (CM)

- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life

Integrated logistic support (ILS)

- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface

Features, functions and context of engineering

- Uses of graphics for purposes, such as:

graphics include:

- design specifications
- production specifications
- maintenance procedures
- technical specifications and descriptions
- Graphical representation techniques, including orthogonal, 2-D and 3-D modelling, isometric and mechanical perspective, dimensioning, limits and fits, welding and other standard symbols
- Role of WHS and regulatory requirements, codes of practice, risk assessment and registration requirements
- Availability and features of a range of standards related to aircraft structure and system design, maintenance and modification
- Typical criteria for aeronautical designs
- Software developments
- Current graphical methods compared with traditional methods
- Emerging developments in graphics and related engineering software

Aeronautical systems and components include:

- Structure and structural components
- Mechanical systems and components
- Hydraulic systems and components
- Pneumatic systems and components
- Fuel systems and components
- Power plants (engines and engine systems and components)
- Standard fasteners and locking systems
- Electrical
- Electronic
- Automatic flight and automatic engine control interface

Appropriate technical and professional assistance includes:

- Assistance from individuals with Civil Aviation Safety Authority (CASA) maintenance certification licenses or those with supervisory authorisations in the Australian Defence Force (ADF) regulatory system
- Professional support from engineers employed within:
 - organisations with CASA design, continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
- Engineers employed within organisations recognised by overseas airworthiness organisations

WHS, regulatory requirements and enterprise

- WHS Acts and regulations
- Relevant standards

procedures include:

- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- State and territory regulatory requirements applying to electrical work

Aviation regulatory requirements include:

- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities where applicable e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Relevant standards include:

- AS 1100.101-1992 Technical drawing – General principles
- AS 1102.101-1989 Graphical symbols for electrotechnical documentation - General information and general index
- AS/NZS ISO 31000 Set:2013 Risk Management Set
- DEF(AUST) 5085B Engineering Drawing – Acquisition and Preparation for Defence Equipments Part 1 – Acquisition Requirements
- DEF(AUST) 5085B Engineering Drawing – Acquisition and Preparation for Defence Equipments Part 2 – Preparation Requirements
- FAA 8083-30 Chapter 2 Aircraft Drawings
- British Defence Standard 00-970 Design and Airworthiness Requirements for Service Aircraft
- US Military Specifications and Standards relevant to aircraft design
- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- CASA AC 21-99 Aircraft Wiring and Bonding
- FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair

Unit Mapping Information

Release 2. Equivalent to MEA701 Produce aeronautical engineering related graphics

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>