



Australian Government

MEM23052 Apply basic electro and control scientific principles and techniques in aeronautical engineering

Release: 1

MEM23052 Apply basic electro and control scientific principles and techniques in aeronautical engineering

Modification History

Release 1. Supersedes and is equivalent to MEM23052A Apply basic electro and control scientific principles and techniques in aeronautical engineering

Application

This unit of competency defines the skills and knowledge required to apply basic electro and control scientific principles and techniques to aeronautical engineering situations including as a member of a design and development team in support of the design and development of engineering applications.

Aeronautical refers to the engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace mechanical, hydraulic, pneumatic, fuel and fire products, processes, systems or services for civil and military applications.

The unit applies to engineering or related activities requiring specific electro and control scientific principles and techniques and is suitable for people giving technical support to aeronautical engineering activities and those pursuing technical qualifications and careers at paraprofessional or technician level.

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

Pre-requisite Unit

Nil

Competency Field

Engineering science

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. Research basic electro and control scientific principles and techniques	1.1 Research and report on basic electro and control scientific principles relating to aeronautical engineering from appropriate sources of information and examination of applications 1.2 Identify basic electro and control techniques and associated

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	technologies, software and hardware required to implement scientific principles relating to aeronautical engineering situations
2. Select basic electro and control scientific principles and techniques	2.1 Select the relevant basic electro and control scientific principles for the particular aeronautical engineering situation 2.2 Select the relevant basic electro and control techniques and associated technologies, software and hardware for the particular aeronautical engineering situations
3. Apply the relevant basic electro and control scientific principles and techniques	3.1 Apply basic electro and control scientific principles in a consistent and appropriate manner to obtain any required solution 3.2 Use appropriate calculations and coherent units in the solution of engineering calculations 3.3 Use significant figures in engineering calculations 3.4 Apply basic electro and control techniques and associated technologies, software and hardware in a consistent and appropriate manner to obtain required solutions
4. Report results	4.1 Report on solutions for applications involving engineering calculations in an appropriate style 4.2 Report on solutions for applications not involving engineering calculations in an appropriate style

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.

Sources of information	reference texts
------------------------	---

include:	• manufacturer catalogues and industrial magazines • websites • use of phone and email.
Basic scientific techniques and principles refers to calculations and the use of coherent units in the completion of tasks, and includes:	• basic hand and power tool operations • machining • fitting • welding • moulding • fabricating • wiring • programming.
Aeronautical engineering situations include those related to:	• electro-hydraulic and electro-pneumatic systems • fuel storage and distribution systems • engine control systems • propeller control systems • flight control systems.

-
-

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM23052A Apply basic electro and control scientific principles and techniques in aeronautical engineering

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 MEM23052 Apply basic electro and control scientific principles and techniques in aeronautical engineering

Modification History

Release 1. Supersedes and is equivalent to MEM23052A Apply basic electro and control scientific principles and techniques in aeronautical engineering.

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:

- selecting and applying appropriate basic electro and control scientific principles to aeronautical engineering situations
- selecting appropriate basic electro and control techniques and associated technologies, software and hardware to suit specified applications on at least two occasions
- applying and manipulating appropriate formulas for applications involving engineering calculations
- checking validity of equations using dimensional analysis and referring solutions to the original aim of the application
- reporting on solutions in appropriate units, using significant figures on at least two occasions
- reporting on limitations of solutions, due to assumptions, scientific principles and techniques used on at least two occasions.

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:

- basic concepts and principles of aeronautical engineering
- sources of information
- electro and control scientific principles
- limitations of selected basic scientific principles
- skills required to complete tasks
- basic electro and control techniques and related technologies, software and hardware associated with implementing scientific principles in aeronautical engineering solutions
- limitations of basic techniques and associated technologies, software and hardware
- applicability and limitations of basic electro and control scientific principles
- applicability and limitations of basic electro and control and associated technologies, software and hardware

- appropriateness of calculations
- fundamental and derived quantities
- common systems of units
- procedure for converting between systems of units
- common prefixes used with units and their values
- procedure for carrying out dimensional analysis
- concept of significant figures
- uncertainty of computations based on experimental data
- procedures for determining the significance of figures in calculations
- procedures for estimating errors in derived quantities.
-

Assessment Conditions

- Assessors must:
 - have vocational competency in applying basic electro and control scientific principles and techniques in aeronautical engineering situations 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 that 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>