



Australian Government

Department of Education, Employment and Workplace Relations

MEM23052A Apply basic electro and control scientific principles and techniques in aeronautical engineering

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit of competency covers applying basic electro and control scientific principles and techniques to aeronautical engineering situations.

Application of the Unit

Applications of this unit include applying basic electro and control scientific principles and techniques as a member of a development team in support of the design and development of engineering applications; identifying a significant electro and control scientific principles and techniques relevant to aeronautical engineering; selecting electro and control scientific principles and techniques for particular aeronautical applications; and applying electro and control principles and techniques to aeronautical engineering tasks.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

1	Research and identify the range of basic electro and control scientific principles and techniques relevant to aeronautical engineering	1.1	Research and report on basic electro and control scientific principles and techniques relevant to aeronautical engineering from appropriate sources and examine applications
		1.2	Identify basic electro and control techniques and associated software and hardware required to implement scientific principles in aeronautical engineering situations
2	Select basic electro and control scientific principles and techniques relevant to particular aeronautical engineering applications	2.1	Select the relevant basic electro and control scientific principles and techniques for aeronautical engineering situations
		2.2	Select the relevant basic electro and control techniques, technologies, software and hardware for particular aeronautical engineering situations
3	Apply the relevant basic electro and control scientific principles and techniques appropriately	3.1	Apply basic electro and control scientific principles in an appropriate manner to obtain any required solution
		3.2	Use appropriate calculations and coherent units in the calculations
		3.3	Use significant figures in engineering calculations
		3.4	Apply basic electro and control techniques and associated software and hardware in a consistent and appropriate manner to obtain required solutions
4	Quote the results of the application of the basic electro and control scientific principles and techniques correctly	4.1	Quote solutions for applications involving engineering calculations in appropriate style
		4.2	Quote solutions for applications not involving engineering calculations in appropriate style

Required Skills and Knowledge

Required knowledge includes:

- electro and control scientific principles
- limitations of selected basic scientific principles
- basic electro and control techniques and related technologies, software and hardware associated with implementation of 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
- the procedure for converting between systems of units
- common prefixes used with units and their values
- the procedure for carrying out dimensional analysis
- the 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

Required skills include:

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

Evidence Guide

Overview of assessment	A person who demonstrates competency in this unit must be able to apply basic electro and control scientific principles and techniques in aeronautical engineering situations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	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. 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 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	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. 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.
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 applying basic electro and control scientific principles and techniques in mechanical and manufacturing engineering situations or other units requiring the exercise of the skills and knowledge covered by this unit.
Guidance information for assessment	

Range Statement

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

Unit Sector(s)

Engineering science

Custom Content Section

Not applicable.