



Australian Government

Department of Education, Employment and Workplace Relations

MEM23096A Apply avionic system design principles and techniques in avionic engineering situations

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit of competency covers avionic system design principles in avionic engineering situations.
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Application of the Unit

This unit applies to selecting and applying avionic system design principles and techniques appropriate to avionic applications. Computer techniques, graphical methods and mathematical calculations should complement scientific principles of unit analysis, appropriate precision and accuracy, and use conservative estimations.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA272A	Apply basic scientific principles and techniques in avionic engineering situations
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Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

1	Identify the range of avionic system design principles and techniques relevant to avionic engineering	1.1	Research and report on avionic system design principles and sources of information
		1.2	Identify the avionic system design principles relating to applications
		1.3	Research and report on avionic system design techniques, technologies, software and hardware associated with principles relating to avionic engineering applications and sources of information
2	Select avionic system design principles and techniques relevant to avionic engineering applications	2.1	Select the relevant avionic system design principles for engineering situations
		2.2	Select the relevant avionic system design techniques and technologies, software and hardware for particular avionic situations
3	Apply the relevant avionic system design principles and techniques appropriately	3.1	Apply the avionic system design principles in a consistent manner to obtain any required solution
		3.2	Use appropriate calculations and correct units to establish solutions
		3.3	Use coherent units in equations in a systematic manner to establish solutions
		3.4	Use significant figures in engineering calculations
		3.5	Apply the avionic system design 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 avionic system design 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:

- avionic engineering techniques and related technologies, software and hardware associated with implementing principles in engineering solutions and related to appropriate engineering applications
- the limitations of avionic engineering techniques and associated technologies, software and hardware
- the relevance of scientific principles to avionic engineering
- the applicability and limitations of an extensive range of avionic engineering techniques and associated technologies and hardware
- the choice of avionic engineering scientific principles for particular applications
- the applicability of particular avionic engineering techniques and associated technologies, software and hardware to applications
- the choice of avionic engineering techniques and associated technologies, software and hardware for particular applications
- the method of application of the scientific principles
- 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 ensuring coherent units for meaningful solutions to equations
- the concept of significant figures
- the uncertainty of computations based on experimental data
- procedures for determining the significance of figures in calculations
- procedures for estimating errors in derived quantities
- the method of application of the mechanical engineering techniques and associated technologies, software and hardware
- the significance of the calculation solution style in relation to the original task
- the significance of the non-calculation solution style in relation to the original task

Required skills include:

- applying advanced scientific principles relevant to avionic engineering
- analysing the given situation to determine what is required in the manner of a solution
- analysing the given situation to determine which avionic engineering scientific principles are selected
- selecting appropriate avionic engineering techniques and associated technologies, software and hardware
- applying appropriate avionic engineering principles in determining the required solution
- applying and manipulating formulas and calculations for engineering applications
- using the correct units to solve engineering calculations
- checking the validity of equations using a systematic method for ensuring coherent units
- applying avionic engineering techniques and associated technologies, software and hardware in a manner consistent with application and identified scientific principles
- referring solutions to the original aim of the application
- quoting solutions in appropriate units and using appropriate significant figures
- presenting solutions referring to the original aim of the application

Evidence Guide

Overview of assessment	A person who demonstrates competency in this unit must be able to apply avionic system design principles and techniques in avionic 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 avionic system design principles and techniques in avionic engineering situations or other units requiring the exercise of the skills and knowledge covered by this unit.
Guidance information for assessment	

Range Statement

Avionic systems	Avionic systems may include: • electrical systems and related wiring and components (power generation, distribution, control interfaces with hydraulic and pneumatic systems, and caution and warning systems) • mechanical and electro-mechanical flight instruments and indication systems (quantity, pressure, temperature and position) and components • electronic systems and components (communications, radio navigation, pulse, display, automatic flight control, flight management and engine management) • automatic test stations, adapters and software
Sources of information	Sources of information include: • reference texts • manufacturer catalogues and industrial magazines • websites • use of phone, email and fax information gathering
Avionic engineering	Avionic engineering refers to: • the engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace electrical, instrument, radio and electronic systems and components and related test equipment for civil and military applications
Avionic engineering situations	Avionic engineering solutions may include: • working as a member of a design team • developing modifications to systems and components • designing and constructing test equipment • writing test procedures and programs • developing fault trees/fault diagnosis guides

Unit Sector(s)

Engineering science

Custom Content Section

Not applicable.