Australian Government

Department of Education, Employment and Workplace Relations

MEM23098A Apply automated systems principles and techniques in avionic engineering situations

Release: 1

MEM23098A Apply automated systems principles and techniques in avionic engineering situations

Modification History

Not applicable.

Unit Descriptor

This unit of competency covers applying scientific principles and techniques to automated systems in avionic

Application of the Unit

This unit applies to selecting and applying automated systems principles and techniques. It includes identifyi
automated systems and related principles and techniques, selecting principles and techniques for particular au
applying principles and techniques to automated systems, and quoting results.
Applications may include participation in avionic system design, development of modifications, development
tree and fault diagnosis guides, and test equipment development or modification.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEA272A	Apply basic scientific principles and techniques in avionic engineering situations

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 principles and techniques relevant to automated systems	1.1	Research and report on automated systems engineering associated technologies, software and hardware associa scientific principles relating to automated systems appl appropriate sources of information
		1.2	Identify regulatory requirements associated with avioni
2	Select principles and techniques relevant to automated systems applications	2.1	Select the relevant principles for particular automated s
		2.2	Select the relevant techniques and associated technolog hardware for particular automated systems situations
3	Apply the relevant automated systems principles and techniques appropriately	3.1	Apply the principles in a consistent and appropriate ma required solution
		3.2	Use appropriate calculations and correct units to establ
		3.3	Use coherent units in equations in a systematic manner solutions
		3.4	Use significant figures in engineering calculations
		3.5	Apply the techniques and associated technologies, softw consistent and appropriate manner to obtain required so
4	Quote the results of the application of automated systems principles and techniques correctly	4.1	Quote solutions for applications involving engineering appropriate style
		4.2	Quote solutions for applications not involving engineer appropriate style

Required Skills and Knowledge

Required knowledge includes:

- avionic systems techniques and related technologies, software and hardware associated with implementin in engineering solutions and related to appropriate engineering applications
- the limitations of avionic systems techniques and associated technologies, software and hardware
- the relevance of scientific principles to avionic systems engineering
- applicability and limitations of an extensive range of avionic systems techniques and associated technolog hardware
- the choice of avionic systems scientific principles for particular applications
- applicability of particular avionic systems techniques and associated technologies, software and hardware
- the choice of avionic systems techniques and associated technologies, software and hardware for particula
- 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 avionic systems techniques and associated technologies, software and ha
- 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 avionic systems principles relevant to engineering
- analysing the given situation to determine what is required in the manner of a solution
- analysing the given situation to determine which avionic systems principles are selected
- selecting appropriate avionic systems interfacing techniques and associated technologies, software and ha applications
- applying appropriate avionic systems 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 systems interfacing techniques and associated technologies, software and hardware in a the 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 automated systems 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. The candidate must have access to all tools, equipment, materials and documentation required.
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 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 automated systems principles and techniques in engineering situations or other units requiring the exercise of the skills and knowledge covered by this unit.
Guidance information for assessment	

Range Statement

Automated systems	Automated systems refer to: • the engineering discipline concerned with the conceptual development, research, design, manufacture and/or implementation and/or installation, commissioning and maintenance of automated processes, systems or services for converting energy into power and motion, materials into product and components into machines and systems for domestic, commercial, industrial, civil, entertainment, medical or military applications Automated systems may incorporate: • mechanical, electronics, programming, electrical and fluid power elements in a system designed to achieve a desired output in response to a variety of inputs, disturbances and variables
Automated systems engineering techniques	Automated systems engineering techniques includes: • the use of system analysis, mechanical and electro, programming and software skills for design, installation, commissioning, troubleshooting and maintenance of systems, processes and services Automated systems technique may be enhanced by: • the development of basic capabilities with hand and power tools, experience of processes and materials properties
Automated systems applications	In general, principles and techniques for automated systems will include: • mechanical, structural, hydraulic, pneumatic, fluid pumping, electrical and electronic control principles and techniques The control systems will typically include: • sensory elements, such as position, level, pressure, temperature, flow rate, pH sensors, computer, PLC or dedicated microprocessor control together with appropriate signal conditioning and actuator interfacing. Emergency stop and failsafe design should be incorporated as required Communications may be: • hard-wired, telemetric, radio or phone linked Specific avionic applications include: • automatic flight control systems • full authority digital engine control systems • engine indicating and crew alerting systems

	• flight management systems • telemetry associated with flight test recording • aircraft electronic instrument display systems • electronic centralised aircraft monitor systems
Sources of information	Sources of information include: • reference texts • relevant standards • manufacturer catalogues and industrial magazines • websites • use of phone, email and fax information gathering
Regulatory requirements	Regulatory requirements may be found in: • Civil Aviation Regulations or Civil Aviation Safety Regulations • Technical Airworthiness Maintenance Manual (AAP 7001.053) • Federal Aviation Regulations (United States) • European Aviation Safety Regulations • Transport Canada CTA Rules

Unit Sector(s)

Engineering science

Custom Content Section

Not applicable.