



Australian Government

**Assessment Requirements for MEA725
Apply advanced scientific principles and
techniques in avionic engineering situations**

Release: 1

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Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must 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 scientific principles are selected
- selecting appropriate avionic techniques and associated technologies, software and hardware to suit the application
- applying appropriate avionic 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 techniques and associated technologies, software and hardware in a manner appropriate to 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.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- physics – analysis and application of:
 - linear kinematics
 - planar kinematics
 - Newton's Laws of Motion
 - friction
 - momentum and center of gravity
 - gravity
 - circular motion
 - orbital motion
 - rotational motion
 - oscillation

- electronic fundamentals – determination of required values and characteristics for:
 - resistors, including light and voltage dependent resistors
 - capacitors
 - inductors
 - transformers
 - diodes
 - transistors
 - power amplifiers
 - oscillators
 - silicon controlled rectifiers
 - thyristor power control circuits
 - opto-couplers
- selection of appropriate test equipment
- digital electronics – design, construction and testing of:
 - clocked sequential circuits
 - registers
 - oscillators
 - timers
 - interfacing circuits
 - program logic array
 - state machines
- data communications – analysis and application of:
 - selection of data transmission methods
 - universal asynchronous receiver transmitter construction
 - multiplexers and demultiplexers
 - data encryption/decryption theory
- electronic circuit analysis
- aerodynamics – application of:
 - drag and speed
 - power/thrust available and power/thrust required
 - manoeuvring flight
 - stability and control
- strength of materials – application of:
 - bending and shear in beams
 - forces in trusses and frames
 - engineering concepts of stress and strain
 - properties of areas
 - torsion
 - mechanical properties of materials
 - two dimensional stress and strain, including elastic constants

- computer software/programming – application of:
 - high level languages
 - algorithm design and testing
 - Pascal and Turbo-Pascal programming
- the limitations of avionic techniques and associated technologies, software and hardware
- the procedure for ensuring coherent units for meaningful solutions to equations
- the concept of significant figures
- the uncertainty of computations based on experimental data
- the procedures for determining the significance of figures in calculations
- the procedures for estimating errors in derived quantities
- the method of application of the avionic techniques and associated technologies, software and hardware
- the application of the calculation solution style
- the significance of the non-calculation solution style.

Assessment Conditions

- 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, a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors should ensure that candidates can:
 - consistently select and apply appropriate scientific principles in avionic engineering situations
 - document in an appropriate style the solutions obtained through the application of chosen scientific principles in avionic engineering situations.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

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