Australian Government

Assessment Requirements for MEA727 Apply calculus 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:

- identifying and defining avionic circuit analysis problems
- collecting and analysing data through the application of calculus techniques
- reporting and presenting data and quantitative information
- communicating effectively with stakeholders on problem resolution.

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:

- differential calculus:
  - differentiation from first principles
  - differentiation by rule
  - differentiating derivatives of trigonometric, logarithmic and exponential functions
  - Newton's method
  - differentiation application (turning points, intercepts, limits, symmetry, maxima and minima rates)
  - solving first and second order differential equations
  - solving problems involving partial differentiation with up to three independent variables
- integral calculus:
  - definite integrals
  - indefinite integrals
  - integration of trigonometric, algebraic and exponential functions
  - integration using partial fractions
  - integration using improper integrals
  - integration by parts
  - integration with the aid of tables
  - the calculation of areas and volumes
  - the determination of means and root mean square

  - the application of double integrals to moments problems and application of double integrals in polar form
- complex numbers – manipulation of complex numbers and application of De Moivre's theorem
- electronic circuit analysis using fourier analysis and laplace transforms.

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, then 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 must be satisfied that the candidate can competently and consistently:
  - identify appropriate calculus technique(s) for avionic engineering or related problems
  - apply the appropriate technique to the problem
  - perform circuit analysis using fourier analysis and laplace transforms
  - check answer has addressed problem
  - communicate the outcome of the analysis in an appropriate manner.
- 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