



Australian Government

MEA341 Apply basic aircraft design characteristics

Release: 2

MEA341 Apply basic aircraft design characteristics

Modification History

Release 2. Equivalent to MEA341 Apply basic aircraft design characteristics with amended prerequisite codes.

Application

This unit of competency requires application of basic knowledge of aerodynamic shape and structural methods for aeroplanes and rotary wing aircraft.

The unit is part of Diploma and Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA154	Apply work health and safety practices in aviation maintenance
MEA158	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1.	Research and evaluate aeroplane aerodynamic shape	1.1	Common wing plan forms are identified and relative advantages and disadvantages are evaluated
		1.2	Common wing configurations are identified and relative advantages and disadvantages are identified

		1.3	Aerofoil characteristics are discussed in terms of aircraft performance
		1.4	Aeroplane stability and control is discussed in terms of aerodynamic design
		1.5	Types of primary and secondary flight control surfaces are identified and control balancing is discussed
		1.6	Types of lift augmentation device are identified and compared
		1.7	Factors that affect an aircraft in subsonic and high speed flight are identified
2.	Research and evaluate rotary wing aerodynamic design	2.1	Common rotor configurations are identified and discuss their aerodynamic characteristics discussed
		2.2	Rotary wing aircraft control and stability are discussed
3.	Research and evaluate basic aircraft structural design	3.1	The loads acting on an aircraft structure are identified
		3.2	The methods of construction of airframes and power plant support structures are identified and compared
		3.3	The materials of construction commonly used in aircraft structures are identified and their relative advantages and disadvantages discussed
		3.4	Fabrication methods commonly used in aircraft structure are identified and discussed
		3.5	Maintenance requirements for aircraft structure are identified
4.	Research and evaluate basic landing gear design and construction	4.1	The configurations of landing gear are identified and discussed in terms of relative advantages and disadvantages
		4.2	The relative benefits of fixed and retractable landing gear are identified and discussed
		4.3	Construction materials used in landing gear components are identified and discussed
5.	Apply basic aircraft	5.1	Given required aircraft use and performance characteristics an appropriate aerodynamic shape is

design characteristics

determined

- 5.2 An appropriate method of construction, materials of construction and fabrication method are proposed
- 5.3 An appropriate landing gear configuration is proposed

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Common wing plan forms include:

- Straight
- Tapered
- Swept
- Delta
- Variable geometry
- Canard

Common wing configurations include:

- Mid-wing
- Low wing
- High wing

Common rotor configurations include:

- Main rotor and tail rotor
- Two main rotors
- Two blade main rotor
- Multiple blade main rotor
- Hinged main rotor blades
- Rigid rotor

Configurations of landing gear include:

- Tricycle
- Tail wheel
- Tail skid
- Floats
- Skis
- Helicopter skids
- Helicopter wheels and brakes

Unit Mapping Information

Release 2. Equivalent to MEA341 Apply basic aircraft design characteristics

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for MEA341 Apply basic aircraft design characteristics

Modification History

Release 2. Equivalent to MEA341 Apply basic aircraft design characteristics with amended prerequisite codes.

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 the effects of aerodynamic shape and types of flight controls on aircraft performance, stability and control
- identifying the influence of rotor design on rotary wing aircraft stability and control
- identifying the loads acting on aircraft structure, types of structure and related maintenance requirements
- identifying the types and designs of landing gear and their applications.

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:

- theory of flight, including rotary wing
- loads acting on aircraft structures and structural fatigue, including rotary wing
- aircraft design characteristics, including rotary wing
- types of aircraft structure
- methods of aircraft construction
- materials of construction
- structural maintenance requirements
- use of non-destructive testing (NDT) in structural maintenance
- basic landing gear design characteristics
- use of ultra-high strength steels in landing gear design and related maintenance requirements.

Assessment Conditions

- This unit may be assessed off the job in a training environment equipped to provide exposure to the relevant aircraft design characteristics and to theory of flight.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.

- 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, teacher'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.
- 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>