Title	**Demonstrate knowledge of electrical fundamentals for aeronautical engineering (EASA 147 Maintenance)**		
Level	**5**	**Credits**	**20**

Purpose	This knowledge-based unit standard is one of a series intended for people under training to gain authorisation to certify, to European Aviation Safety Agency (EASA) standards, the release to service of aircraft or aeronautical components following maintenance or repair. People credited with this unit standard are able to demonstrate knowledge of electrical fundamentals for aeronautical engineering (EASA 147 Maintenance).

Classification	Aeronautical Engineering > Aeronautical Maintenance Certification

Available grade	Achieved

Guidance Information

1 This unit standard is aligned with the European Aviation Safety Agency Examination Standard for *Module 3 Electrical Fundamentals* and will be evidenced by meeting these requirements. This can be located through the EASA website at http://www.easa.europa.eu.

2 *Knowledge* – will be in the context of aeronautical maintenance as defined by European Commission Regulation (EU) No 1321/2014 as follows: ‘A detailed knowledge of the theoretical and practical aspects of the subject and a capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner’; will include making judgements regarding the scope, processes, and quality of maintenance for release to service certification; and will be in accordance with industry texts as defined by the candidate’s workplace or enterprise.

3 *Industry texts* include but are not limited to –
published aeronautical training manuals or text books;
enterprise exposition;
manufacturer publications;
government and local body legislation;
airworthiness or regulatory authority requirements.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of electrical fundamentals for aeronautical engineering (EASA 147 Maintenance).

Performance criteria

1.1 Electron theory is described and its applications are explained.

Range may include but is not limited to – electrical terminology; structure and distribution of electrical charges in atoms, molecules, ions, compounds; molecular structure of conductors, semiconductors, insulators.

1.2 Static electricity and conduction is described and their applications are explained.

Range may include but is not limited to – electrostatic charges; conventional and electron flow; methods of creating electron flow; conduction in solids, liquids, gases, vacuum.

1.3 Direct current sources of electricity are described and their applications are explained.

Range may include but is not limited to – construction and basic chemical action of cells; series; parallel; internal resistance; thermocouples; operation of photo-cells.

1.4 Direct current electrical circuits are described and their applications are explained.

Range may include but is not limited to – calculations using Ohm’s Law, Kirchhoff’s voltage, current laws; potentiometers; rheostats; Wheatstone Bridge; temperature coefficients; capacitors; capacitance.

1.5 Power is described and its applications are explained.

Range may include but is not limited to – power, dissipation of power, calculations involving power, work, energy.

1.6 Capacitance and capacitor are described and their applications are explained.

Range may include but is not limited to – operations and function of a capacitor.

1.7 The principles of DC motor and generator theory are described and their applications are explained.

Range may include but is not limited to – magnetism, inductance, DC generator theory.

1.8 Alternating current theory is described and its applications are explained.

Range may include but is not limited to – waveforms; principles of resistive (R), capacitive (C), inductive (L) circuits.

1.9 Transformer theory is described and its applications are explained.

Range may include but is not limited to – phases.

1.10 Filter theory is described and its applications are explained.

Range may include but is not limited to – low pass, high pass, band pass, band stop.

1.11 Alternating current generator and motor theory are described and their applications are explained.

Range may include but is not limited to – simple waveform production, AC synchronous and induction motors.

Planned review date	31 December 2027

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	16 August 2012	31 December 2020
Review	2	28 September 2017	31 December 2024
Review	3	27 October 2022	N/A

Consent and Moderation Requirements (CMR) reference	0028

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Ringa Hora Services Workforce Development Council qualifications@ringahora.nz if you wish to suggest changes to the content of this unit standard.