

Aviation Maintenance Curriculum

Fundamentals of DC Electricity and Electronics Syllabus

Summary: The Fundamentals of DC Electricity course is designed to align with general knowledge and skill requirements set forth in Federal Aviation Administration's Mechanic Airman Certification Standards.

The course addresses the fundamental concepts that are the building blocks for advanced electrical knowledge and practical troubleshooting. Some of the questions addressed are: How does energy travel through a copper wire and through space? What is electric current, electromotive force, and what makes a landing light turn on or a hydraulic pump motor run? Each of these questions requires an understanding of many basic principles. By adding one basic idea on top of other basic ideas, it becomes possible to answer most of the interesting and practical questions about electricity or electronics. Technicians need to be able to practically apply these concepts to be successful in the field of aviation maintenance.

Course Number: FAA-ACS-AM-IA-DCE

ACS Reference: Fundamentals of Electricity and Electronics (AM.I.A)

Topics Covered:

1. Fundamentals of Electricity
2. DC Circuits
3. Circuit Measuring Instruments
4. Batteries

Activities:

- A. Perform circuit continuity test.
- B. Measure voltage.

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- C. Measure current.
- D. Measure resistance.
- E. Test a switch or relay.
- F. Test a fuse or circuit breaker.
- G. Read and interpret aircraft electrical circuit diagrams, and symbols, including solid state devices and logic functions.
- H. Troubleshoot a circuit.
- I. Identify symbols used in electrical and electronic schematic diagrams
- J. Measure voltage drop across a resistor.
- K. Determine or measure for open electrical circuits.
- L. Inspect and service an aircraft battery.

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Fundamentals of Electricity and Electronics Course Outline

Module 1: Fundamentals of Electricity

- Lesson 1.1 – Matter and Static Electricity
- Lesson 1.2 – Magnetism
- Lesson 1.3 – Electromagnetism

Module 2: DC Circuits

- Lesson 2.1 – Ohm’s Law
- Lesson 2.2 – Electric Power
- Lesson 2.3 – Circuit Schematics and Resistors
- Lesson 2.4 – Circuit Protection and Control Devices
- Lesson 2.5 – Series DC Circuits and KVL
- Lesson 2.6 – Parallel DC Circuits and KVL
- Lesson 2.7 – Capacitors in DC Circuits
- Lesson 2.8 – Inductors in DC Circuits

Module 3: Circuit Measuring Instruments

- Lesson 3.1 – DC Measuring Instruments
- Lesson 3.2 – Troubleshooting Circuits

Module 4: Batteries

- Lesson 4.1 – Introduction to Battery Types
- Lesson 4.2 – Lead-Acid Batteries
- Lesson 4.3 – Ni-Cad Batteries

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Each lesson contains the following:

- Lesson Objectives
- Video lecture
- Multiple readings with interactive animations
- Assigned readings in the applicable FAA 8083 Chapter
- Summary and Key Terms
- Assessment Activities

Each Module contains the following:

- Key Concepts and Terms
- Further Study
- Module Quiz
- Module Critical Thinking Activity

Each Course contains the following:

- Course Pre-Test
- Course Introduction
- Course Comprehensive Assessment
- Course Survey

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