

## Aviation Maintenance Curriculum

### Fundamentals of AC Electricity and Electronics Syllabus

**Summary:** The Fundamentals of AC 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-ACE

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

**Topics Covered:**

1. Aircraft Alternating Current
2. Generators, Motors, and Alternators
3. Electronics and Logic
4. Measuring Devices

Revision Number: 00

Revision Date: 01/15/26

Original Issue Date: 01/15/26

- Activities:
- A. Perform circuit continuity test.
  - B. Measure voltage.
  - C. Demonstrate how to test for short-circuit and open-circuit conditions.
  - D. Measure voltage drop across a resistor.
  - E. Determine or measure for open electrical circuits.

## **Fundamentals of Electricity and Electronics Course Outline**

### **Module 1: Aircraft Alternating Current**

- Lesson 1.1 – Introduction to Alternating Current
- Lesson 1.2 – Reactance in AC Circuits
- Lesson 1.3 – Ohm's Law for AC Circuits

### **Module 2: Generators, Motors, and Alternators**

- Lesson 2.1 – DC Generators
- Lesson 2.2 – Characteristics and Maintenance of Generators
- Lesson 2.3 – DC Motors
- Lesson 2.4 – AC Motors
- Lesson 2.5 – Alternators
- Lesson 2.6 – Generator Regulation

### **Module 3: Electronics and Logic**

- Lesson 3.1 – Semiconductors and Diodes
- Lesson 3.2 – Intro to Transistors
- Lesson 3.3 – Filtering
- Lesson 3.4 – Amplifiers
- Lesson 3.5 – Logic Circuits

### **Module 4: Measuring Devices**

- Lesson 4.1 – Introduction to Measuring Devices

Revision Number: 00

Revision Date: 01/15/26

Original Issue Date: 01/15/26



- Lesson 4.2 – AC Measuring Instruments

**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

Revision Number: 00

Revision Date: 01/15/26

Original Issue Date: 01/15/26