



Aviation Maintenance Curriculum

Fundamentals of Electricity and Electronics Syllabus

Summary: 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 an 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-FEE

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

Topics Covered:

1. Fundamentals of Electricity
2. DC Circuits
3. AC Circuits
4. Circuit Measuring Instruments
5. Electronics and Logic
6. Generators, Motors, and Alternators

Activities:

- A. Operating a breadboard
- B. Battery Servicing

Revision Number: 00

Revision Date: 02/15/22

Original Issue Date: 02/15/22



Fundamentals of Electricity and Electronics Course Outline

Module 1: Fundamentals of Electricity

- Lesson 1.1 – Composition of Matter
- Lesson 1.2 – Static Electricity
- Lesson 1.3 – Magnetism
- Lesson 1.4 – Electromagnetism

Module 2: DC Circuits

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

Module 3: AC Circuits

- Lesson 3.1 – Alternating Current
- Lesson 3.2 – Reactance
- Lesson 3.3 – AC Circuits
- Lesson 3.4 – AC Power
- Lesson 3.5 – Transformers and Inverters

Module 4: Circuit Measuring Instruments

- Lesson 4.1 – DC Measuring Instruments
- Lesson 4.2 – AC Measuring Devices
- Lesson 4.3 – Batteries
- Lesson 4.4 – Risk Management

Revision Number: 00

Revision Date: 02/15/22

Original Issue Date: 02/15/22



Module 5: Electronics and Logic

- Lesson 5.1 – Semiconductors and Diodes
- Lesson 5.2 – Intro to Transistors
- Lesson 5.3 – Filtering
- Lesson 5.4 – Amplifier Circuits
- Lesson 5.5 – Digital Logic

Module 6: Generators, Motors, and Alternators

- Lesson 6.1 – DC Generators
- Lesson 6.2 – DC Generator Characteristics and Maintenance
- Lesson 6.3 – DC Motors
- Lesson 6.4 – AC Motors
- Lesson 6.5 – Alternators
- Lesson 6.6 – Generator Regulation

Each lesson contains the following:

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

Each Module contains the following:

- Summary Points and Key Terms
- Module quiz
- Module Critical Thinking Activity

Educate Workforce Simulations included in this course include:

- Operating a breadboard
- Battery servicing

Revision Number: 00

Revision Date: 02/15/22

Original Issue Date: 02/15/22