

EASA Part 66 – Module 3 – Electrical Fundamentals – 3 Days

Introduction

Module 3 covers all things electrical and looks at Electron theory, Static Electricity, Terminology, Generation DC sources & Circuits, Resistance, Capacitance, Magnetism, Inductance, AC theory, AC Generators & Motors

On completion of the module you will be able to sit a multi-choice exam and on passing will receive a completion certificate.

All Part 66 training courses are provided under the direct control, oversight, and guidance of EAI.

European Aviation Institute (EAI) is an EASA Part 147 approved Maintenance Training Organization (MTO) with Certificate of Approval No RO.147.0003. Providing Part 147 and other specialized "non-EASA Part 147" training courses. Providing both integrated and modular packaged quality training solutions from our center in Bucharest or at other preferred locations.

European Aviation Institute was established with the goal of raising the standards of aeronautical training, with access to skilled instructors, the focus is on delivering best-in-class skills to existing and new generations of aviation technicians and engineers.

Who is the course for?

This course is suitable for Licensed Aircraft Engineers who are essential to maintain the global aviation industry. Employment in the field of aviation offers the potential of a wide and varied career with an attractive salary.

What is the Benefit of this Training – What will I learn?

The course is made to provide you with a comprehensive understanding of the electrical systems used in aircraft and their maintenance. During the course, you will learn how to maintain and troubleshoot electrical systems in aircraft.

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Date	On Demand
Category	Personal Development
Venue	On Demand
Level	Basic
Price	On Demand

Detailed Content / Topics - The following Subjects will be addressed

1. Electron Theory

- Structure and distribution of electrical charges within atoms, molecules, ions, and compounds;
- Molecular structure of conductors, semiconductors, and insulators

2. Static Electricity and Conduction

- Static electricity and distribution of electrostatic charges;
- Electrostatic laws of attraction and repulsion;
- Units of charge, Coulomb's Law;
- Conduction of electricity in solids, liquids, gases, and a vacuum

3. Electrical Terminology

- The following terms, their units, and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, and electron flow.

4. Generation of Electricity

- Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism, and motion.

5. DC Sources of Electricity

- Construction and basic chemical action of primary cells, secondary cells, lead acid cells, nickel-cadmium cells, and other alkaline cells;
- Cells connected in series and parallel;
- Internal resistance and its effect on a battery;
- Construction, materials, and operation of thermocouples; Operation of photo-cells

6. DC Circuits

- Ohms Law, Kirchoff's Voltage and Current Laws;
- Calculations using the above laws to find resistance, voltage, and current;
- Significance of the internal resistance of a supply.

7. Resistance/Resistor

- Resistance and affecting factors;
- Specific resistance;
- Resistor color code, values, tolerances, preferred values, and wattage ratings;
- Resistors in series and parallel;
- Calculation of total resistance using series, parallel, and series-parallel combinations;
- Operation and use of potentiometers and rheostats;
- Operation of Wheatstone Bridge;
- Positive and negative temperature coefficient conductance;

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8. Power

- Power, work, and energy (kinetic and potential);
- Dissipation of power by a resistor;
- Power formula;
- Calculations involving power, work, and energy.

9. Capacitance/Capacitor

- Operation and function of a capacitor;
- Factors affecting capacitance area of plates, the distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating;
- Capacitor types, construction, and function;
- Capacitor color coding;
- Calculations of capacitance and voltage in series and parallel circuits;
- Exponential charge and discharge of a capacitor, time constants;
- Testing of capacitors.

10. Magnetism

- Theory of magnetism;
- Properties of a magnet;
- Action of a magnet suspended in the Earth's magnetic field;
- Magnetisation and demagnetization;
- Magnetic shielding;
- Various types of magnetic material;
- Electromagnets construction and principles of operation;
- Hand clasp rules to determine: magnetic field around current carrying conductor;
- Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents;
- Precautions for care and storage of magnets

11. Inductance/Inductor

- Faraday's Law;
- Action of inducing a voltage in a conductor moving in a magnetic field;
- Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns; Mutual induction;
- The effect the rate of change of primary current and mutual inductance has on induced voltage;
- Factors affecting mutual inductance: number of turns in the coil, the physical size of the coil, the permeability of coil, the position of coils with respect to each other;
- Lenz's Law and polarity determining rules;
- Back emf, self-induction;
- Saturation point;
- Principle uses of inductors.

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12. DC Motor/Generator Theory

- Basic motor and generator theory;
- Construction and purpose of components in DC generator;
- Operation of, and factors affecting output and direction of current flow in DC generators;
- Operation of, and factors affecting output power, torque, speed, and direction of rotation of DC motors; - A series wound, shunt wound, and compound motors;
- Starter Generator construction.

13. AC Theory

- Sinusoidal waveform: phase, period, frequency, cycle;
- Instantaneous, average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current, and power;
- Triangular/Square waves;
- Single/3 phase principles.

14. Resistive (R), Capacitive (C), and Inductive (L) Circuits

- Phase relationship of voltage and current in L, C, and R circuits, parallel, series and series-parallel; - Power dissipation in L, C, and R circuits;
- Impedance, phase angle, power factor, and current calculations;
- True power, apparent power, and reactive power calculations

15. Transformers

- Transformer construction principles and operation;
- Transformer losses and methods for overcoming them;
- Transformer action under load and no-load conditions;
- Power transfer, efficiency, polarity markings;
- Calculation of line and phase voltages and currents;
- Calculation of power in a three-phase system;
- Primary and Secondary current, voltage, turns ratio, power, efficiency;
- Auto transformers.

16. Filters

- Operation, application, and uses of the following filters: low pass, high pass, band pass, and band stop.

17. AC Generators

- Rotation of loop in a magnetic field and waveform produced;
- Operation and construction of revolving armature and revolving field type AC generators;
- Single-phase, two-phase and three-phase alternators;
- Three phase star and delta connections advantages and uses;
- Permanent Magnet Generators.

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18. AC Motors

- Construction, principles of operation, and characteristics of AC synchronous and induction motors both single and polyphase;
- Methods of speed control and direction of rotation;
- Methods of producing a rotating field: capacitor, inductor, shaded or split pole.

Target Groups

Mechanics & Technicians wishing to develop a detailed understanding of subject material in preparation for the sitting of the EASA Part 147 Module examination.

Pre-requisites

This is a review course so it is important that you spend time studying the material in preparation for your examination – see also www.easaonline.com Part 66 where you can enroll to review the material and practice the examination.

Learning Objectives

To support the achievement of gaining credit in the EASA Part 66 Basic Licence Module Exam.

What do People Say about Sofema Aviation Services Training?

- "I found satisfying answers to all my questions."*
- "The instructor demonstrated very deep knowledge of the subject."*
- "The length of the course fit my needs and expectations."*
- "The content was really effective, I gained a lot of new knowledge."*
- "The practical examples were perfectly delivered."*

Duration

3 days – Start at 09.00 and finish at 17.00, with appropriate refreshment breaks.
To register for this training, please email team@sassofia.com or Call +359 28210806

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