



**Alabama**  
**Department of**  
**Postsecondary Education**

**Representing Alabama's Public Two-Year College System**

**AMT 112**  
**Airframe Systems I**  
**Plan of Instruction**

**Effective Date: 2022**

**Version Number: Base Document**

**AMT 112 Airframe Systems I**    135 Hours    Theory 45    Laboratory 90

**COURSE DESCRIPTION:** This course introduces aircraft electrical, communication, and navigation systems and components. Emphasis is placed on inspecting, repairing, installing, adjusting, and troubleshooting aircraft alternating and direct current electrical systems. Upon completion, students should know the operation and theory of generators, alternators, and starters; be able to fabricate wiring; and inspect, troubleshoot, and repair lighting, communication, and navigation systems.

**This is a CORE course.**

**CONTACT/CREDIT HOURS** (applicable if entire course is taught in a career/technical education degree or non-degree program)

|                             |           |                |
|-----------------------------|-----------|----------------|
| Theory Contact/Credit Hours | 3/3 hours | 45 hours (1:1) |
| Lab Contact/Credit Hours    | 6/2 hours | 90 hours (3:1) |
| Total Contact/Credit Hours  | 9/5 hours | 135/5 hours    |

NOTE: Colleges may schedule lab hours as manipulative (3:1) or experimental (2:1). Adjustments in contact hours must be made accordingly.

**PREREQUISITE COURSES** (applicable if entire course is taught in a career/technical education degree or non-degree program)

Determined by college unless stated otherwise.

**CO-REQUISITE COURSES** (applicable if entire course is taught in a career/technical education degree or non-degree program)

Determined by college unless stated otherwise.

**INDUSTRY COMPETENCIES**

**AM.II.I Communication and Navigation Systems**

|                  |  |
|------------------|--|
| AM.II.I.K1 – K21 | Knowledge of comm/nav systems  |
| AM.II.I.R1 – R6  | Ability to identify, assess, and mitigate risks associated with comm/nav systems     |
| AM.II.I.S1 – S13 | Ability to Demonstrate SKILLS associated with maintenance/repair of comm/nav systems |

**AM.II.K Aircraft Electrical Systems**

AM.II.K.K1 – K17 Knowledge of aircraft electrical systems

AM.II.K.R1 – R9 Ability to identify, assess, and mitigate risks associated with aircraft electrical systems

AM.II.K.S1 – S20 Ability to Demonstrate SKILLS associated with maintenance/repair of electrical systems

**COURSE OBJECTIVES**

The cognitive objective of this course is for each student to comprehend foundational knowledge needed to perform stated entry-level industry competencies.

The performance objective of this course is for each student to apply foundational knowledge to problems and exercises encountered in class.

**COURSE CONTENT OUTLINE FAA AUTHORITY 147****AM.II.K Aircraft Electrical Systems**

AM.II.K.K7 Aircraft wiring sizes, types, selection, installation and circuit protection devices.

AM.II.K.K8 Derating factors in switch selection.

AM.II.K.K9 Aircraft wiring shielding.

AM.II.K.K10 Aircraft lightning protection.

AM.II.K.K11 Instrument or instrument panel removal and installation.

AM.II.K.K13 Electrical system troubleshooting.

AM.II.K.K14 Soldering preparation, types of solder, and flux usage.

AM.II.K.K15 Aircraft electrical connectors, splices, terminals, and switches.

AM.II.K.K16 Electrical system measurement, adjustment, and testing.

AM.II.K.R3 Maintenance on energized circuits/systems.

AM.II.K.R4 Maintenance in areas containing aircraft wiring.

AM.II.K.R5 Routing and securing wires and wire bundles.

AM.II.K.R6 Selecting the size of wire in an electrical circuit.

AM.II.K.R7 Selection or installation of wire terminals.

AM.II.K.R8 Effects of soldering.

AM.II.K.R9 Soldering practices.

AM.II.K.S1 Inspect aircraft wiring to verify installation and routing.

AM.II.K.S2 Perform wire terminating and splicing.

AM.II.K.S3 Assemble an aircraft electrical connector.

AM.II.K.S4 Use a wiring circuit diagram to identify components.

AM.II.K.S5 Solder aircraft wiring.

AM.II.K.S6 Troubleshoot an airframe electrical circuit.

AM.II.K.S7 Install airframe electrical wiring, switches, or protective devices.

AM.II.K.S8 Secure wire bundles.

AM.II.K.S10 Install bonding jumpers.

AM.II.K.S18 Perform a continuity test to verify the condition of a conductor.

AM.II.K.S19 Perform a test on a conductor for a short to ground.

AM.II.K.S20 Perform a test on a conductor for a short to other conductors.

**112 AM.II.K Practical 1 (Aircraft Circuit Fabrication, Installation, & Troubleshooting)**

AM.II.K.S9 Determine an electrical load in a given aircraft system.

**112 AM.II.K Practical 2 Complete Load Analysis)**

**AMT112 Exam 1**

AM.II.K.K1 Generators, DC generation systems, and DC power distribution systems.

AM.II.K.K2 Alternators, AC generation systems, and AC power distribution systems.

AM.II.K.K3 Starter generators.

AM.II.K.K4 Constant speed drive (CSD) and integrated drive generator (IDG) systems and components.

AM.II.K.K5 Voltage regulators and over-volt and overcurrent protection.

AM.II.K.K6 Inverter systems.

AM.II.K.K17 Aircraft battery troubleshooting and maintenance.

AM.II.K.R2 Connecting or disconnecting external power.

AM.II.K.S11 Check output voltage of a DC generator.

AM.II.K.S13 Inspect generator brush serviceability and brush spring tension.

**112 AM.II.K Practical 3 (Inspect Generator Brushes and Check Voltage Output)**

**AMT112 Exam 2**

AM.II.K.K12 Aircraft lighting systems.

AM.II.K.S14 Inspect and check anti-collision, position, and landing lights for proper operation.

**112 AM.II.K Practical 4 (Lighting Systems Components and Troubleshooting)**

AM.II.K.R1 Testing/troubleshooting electrical systems or components.

AM.II.K.S12 Check the resistance of an electrical system component.

AM.II.K.S15 Inspect components in an electrical system.

AM.II.K.S16 Troubleshoot a DC electrical system supplied by an AC electrical system.

AM.II.K.S17 Identify components in an electrical schematic where AC is rectified to a DC voltage.

**112 AM.II.K Practical 5 (Perform Fault Isolation of Various Aircraft Electrical Systems)**

**AMT112 Exam 3**

**AM.II.I Communication and Navigation Systems**

AM.II.I.S1 Make a list of required placards for communication and navigation avionics equipment.

**112 AM.II.I Practical 1 (Required Aircraft Placards)**

AM.II.I.K1 Radio operating principles.

AM.II.I.K2 Radio components.

AM.II.I.K3 Antenna, static discharge wicks, and avionics identification, inspection, and mounting requirements.

AM.II.I.K4 Interphone and intercom systems.

AM.II.I.K5 Very high frequency (VHF), high frequency (HF), and SATCOM systems.

AM.II.I.K6 Aircraft Communication Addressing and Reporting System (ACARS) theory, components, and operation.

AM.II.I.K7 Emergency locator transmitter (ELT).

AM.II.I.R1 ELT testing procedures.

AM.II.I.R2 Performing maintenance on high power/high frequency systems (e.g., weather radar and SATCOM).

AM.II.I.R3 Wire harness routing.

AM.II.I.R4 Mounting antennas.

AM.II.I.S5 Check VHF communications for operation.

AM.II.I.S7 Check an emergency locator transmitter for operation.

AM.II.I.S8 Inspect ELT batteries for expiration date and locate proper testing procedures.

AM.II.I.S12 Inspect a radio installation for security.

**112 AM.II.I Practical 2 (Inspect and Operationally Check Radios)**

**112 AM.II.I Practical 3 (Inspect and Operationally Check ELTs)**

AM.II.I.K16 Autopilot theory, components, and operation.

AM.II.I.K17 Auto-throttle theory, components, and operation.

AM.II.I.K18 Stability augmentation systems (SAS) (Rotorcraft).

AM.II.I.S2 Locate and explain autopilot inspection procedures.

AM.II.I.S3 List autopilot major components.

**112 AM.II.I Practical 4 (Demonstrate Knowledge of Auto Pilot Systems)**

AM.II.I.K8 Automatic direction finder (ADF).

AM.II.I.K9 VHF omnidirectional range (VOR) theory, components, and operation.

AM.II.I.K10 Distance measuring equipment (DME) theory, components, and operation.

AM.II.I.K11 Instrument landing system (ILS) theory, components, and operation.

AM.II.I.K12 Global positioning system (GPS) theory, components, and operation.

AM.II.I.K13 Traffic collision avoidance system (TCAS), theory, components, and operation.

AM.II.I.K14 Weather radar.

AM.II.I.K15 Ground proximity warning system (GPWS) theory, components, and operation.

AM.II.I.K19 Radio altimeter (RA) theory, components, and operation.

AM.II.I.K20 Automatic Dependent Surveillance-Broadcast (ADS-B) theory, components, and operation.

AM.II.I.K21 Transponder/encoder system.

AM.II.I.R5 Electro-static discharge.

AM.II.I.R6 Working around live electrical systems.

AM.II.I.S4 Locate and identify navigation and communication antennas.

AM.II.I.S6 Inspect a coaxial cable installation for security.

AM.II.I.S9 Inspect electronic equipment mounting base for security and condition.

AM.II.I.S10 Inspect electronic equipment shock mount bonding jumpers for resistance.

AM.II.I.S11 Inspect static discharge wicks for security and resistance.

AM.II.I.S13 Locate and explain the installation procedures for antennas, including mounting and coaxial connections.

**112 AM.II.I Practical 5 (Inspect and Maintain Receiving/Transmitting Equipment)**

**AMT112 Exam 4**

**AMT112 Final Examination**