# 9/19/2022

# brcc keystone logo

Baton Rouge Community College

*Academic Affairs Master Syllabus*

Date Approved: 6 October 2022

Term and Year of Implementation: Fall 2022

**Course Title:** Aircraft Electrical

**BRCC Course Rubric:** AMTA 1236

**Previous Course Rubric**:

**Lecture Hours per week-Lab Hours per week-Credit Hours**: 4-6-6

**Per semester: Lecture Hours-Lab Hours-Instructional Contact Hours**: 60-90-150

**Louisiana Common Course Number:**

**CIP Code:** 47.0607

**Course Description:** Introduces students to, Aircraft Instrument Systems, Communications, Light Signals, Runway Lighting Systems, and Aircraft Electrical Systems. This course covers Airframe Curriculum Subjects from the Federal Aviation Administration’s 2021 Airman Certification Standards. This course requires a lab fee.

**Prerequisites:**  AMTA 1216 and AMTA 1224

**Co-requisites:** AMTA 1244

**Suggested Enrollment Cap:** 25

**Learning Outcomes.** *Upon successful completion of this course, the students will be able to:*

1. Demonstrate required knowledge, risk management, and skills competencies for Aircraft Instrument Systems, Airframe Curriculum Subject H in the Federal Aviation Administration’s 2021 Airman Certification Standards.

2. Demonstrate required knowledge, risk management, and skills competencies for Communications, Light Signals, Runway Lighting Systems, and Airframe Curriculum Subject I in the Federal Aviation Administration’s 2021 Airman Certification Standards.

3. Demonstrate required knowledge, risk management, and skills competencies for Aircraft Electrical Systems, and Airframe Curriculum Subject K in the Federal Aviation Administration’s 2021 Airman Certification Standards.

**Assessment Measures.** Assessment of all learning outcomes will be measured using the following methods:

1. Department-designed quizzes and tests.

2. Projects that must be completed with a grade of 70% or better.

3. Students must complete a minimum of 140 contact hours

**Information to be included on the Instructor’s Course Syllabi:**

* ***Disability Statement*:** Baton Rouge Community College seeks to meet the needs of its students in many ways. See the Office of Disability Services to receive suggestions for disability statements that should be included in each syllabus.
* ***Grading:*** The College grading policy should be included in the course syllabus. Any special practices should also go here. This should include the instructor’s and/or the department’s policy for make-up work. For example in a speech course, “Speeches not given on due date will receive no grade higher than a sixty” or “Make-up work will not be accepted after the last day of class”.
* ***Attendance Policy*:** Include the overall attendance policy of the college. Instructors may want to add additional information in individual syllabi to meet the needs of their courses.
* ***General Policies*:** Instructors’ policy on the use of things such as beepers and cell phones and/or hand held programmable calculators should be covered in this section.
* ***Cheating and Plagiarism*:** This must be included in all syllabi and should include the penalties for incidents in a given class. Students should have a clear idea of what constitutes cheating in a given course.
* ***Safety Concerns:*** In some courses, this may be a major issue. For example, “No student will be allowed in the lab without safety glasses”. General statements such as, “Items that may be harmful to one’s self or others should not be brought to class”.
* ***Library/ Learning Resources:*** Since the development of the total person is part of our mission, assignments in the library and/or the Learning Resources Center should be included to assist students in enhancing skills and in using resources. Students should be encouraged to use the library for reading enjoyment as part of lifelong learning.

**Expanded Course Outline:**

I. Aircraft Instrument Systems

A. Knowledge

AM.II.H.K1, Annunciator indicating systems and the meaning of warning, caution, and advisory lights.

AM.II.H.K2, Magnetic compass inspection and operation.

AM.II.H.K3, Magnetic compass swinging procedures.

AM.II.H.K4, Pressure indicating instruments.

AM.II.H.K5, Temperature indicating instruments.

AM.II.H.K6, Position indication sensors and instruments.

AM.II.H.K7, Gyroscopic instruments.

AM.II.H.K8, Direction indicating instruments.

AM.II.H.K9, Instrument vacuum and pneumatic systems.

AM.II.H.K10, Pitot-static system.

AM.II.H.K11, Fuel quantity indicating systems.

AM.II.H.K12, Instrument range markings.

AM.II.H.K13, Electronic displays.

AM.II.H.K14, Electrostatic sensitive devices.

AM.II.H.K15, Built-in test equipment.

AM.II.H.K16, Electronic flight instrument system.

AM.II.H.K17, Engine indication and crew alerting system.

AM.II.H.K18, Heads-up displays (HUDs).

AM.II.H.K19, 14 CFR parts 43 and/or 91 requirements for static system leak checks.

AM.II.H.K20, Instrument limitations, conditions, and characteristics.

AM.II.H.K21, Angle of attack and stall warning systems.

AM.II.H.K22, Takeoff and landing gear configuration warning systems.

AM.II.H.K23, Aircraft bonding and protection.

AM.II.H.K24, Instrument or instrument panel removal and installation.

B. Risk Management

AM.II.H.R1, Use of pressurized air and water during maintenance or cleaning of aircraft instrument systems.

AM.II.H.R2, Actions in response to a reported intermittent warning or caution annunciator light illumination.

AM.II.H.R3, Performing maintenance on equipment identified as electrostatic sensitive.

AM.II.H.R4, Handling of mechanical gyros or instruments containing mechanical gyros.

AM.II.H.R5, Performing pitot/static systems test.

C. Skills

AM.II.H.S1, Perform a static system leak test.

AM.II.H.S2, Remove and install an instrument.

AM.II.H.S3, Install range marks on an instrument glass.

AM.II.H.S4, Determine barometric pressure using an altimeter.

AM.II.H.S5, Check for proper range markings on an instrument.

AM.II.H.S6, Inspect a magnetic compass.

AM.II.H.S7, Locate the procedures for troubleshooting a vacuum-operated instrument system.

AM.II.H.S8, Select proper altimeter for installation on a given aircraft.

AM.II.H.S9, Identify exhaust gas temperature system components.

AM.II.H.S10, Inspect a vacuum system filter for serviceability.

AM.II.H.S11, Adjust gyro/instrument air pressure/vacuum.

AM.II.H.S12, Inspect an aircraft’s alternate air (static) source.

AM.II.H.S13, Locate and explain the adjustment procedures for a stall warning system.

AM.II.H.S14, Inspect outside air temperature gauge for condition and operation.

III. Communications, Light Signals, and Runway Lighting Systems

A. Knowledge

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.K8, Automatic Direction Finder (ADF).

AM.II.I.K9, VHF omnidirectional radio 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 Systems (GPWS) theory, components, and operation.

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.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.

B. Risk Management

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.R5, Electro-static discharge.

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

C. Skills

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

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

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

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

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

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

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.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.S12, Inspect a radio installation for security.

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

III. Aircraft Electrical Systems

A. Knowledge

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 overvoltage and overcurrent protection.

AM.II.K.K6, Inverter 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.K12, Aircraft lighting systems.

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.K17, Aircraft battery troubleshooting and maintenance.

B. Risk Management

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

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

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.

C. Skills

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.S9, Determine an electrical load in a given aircraft system.

AM.II.K.S10, Install bonding jumpers.

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

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

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

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

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.

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.