# 11/26/2022

# brcc keystone logo

Baton Rouge Community College

*Academic Affairs Master Syllabus*

Date Approved: 2 February 2023

Term and Year of Implementation: Spring 2023

**Course Title:** General Maintenance Practices

**BRCC Course Rubric:** AMTG 1016

**Previous Course Rubric**: AMTG 101

**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:** 47.0608

**Course Description:** Introduces students to mathematics, basic physics, aircraft drawings, fluid lines and fittings, and aircraft materials, hardware and processes. This course covers General Curriculum Subjects from the Federal Aviation Administration’s 2021 Airman Certification Standards. This course requires a lab fee and a student fee.

**Prerequisites:**  None

**Co-requisites:** AMTG 1026

**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 Mathematics, General Curriculum Subject H in the Federal Aviation Administration’s 2021 Airman Certification Standards.

2. Demonstrate required knowledge, risk management, and skills competencies for Physics, General Curriculum Subject J in the Federal Aviation Administration’s 2021 Airman Certification Standards.

3. Demonstrate required knowledge, risk management, and skills competencies for Aircraft Drawings, General Curriculum Subject B in the Federal Aviation Administration’s 2021 Airman Certification Standards.

4. Demonstrate required knowledge, risk management, and skills competencies for Fluid Lines and Fittings, General Curriculum Subject D in the Federal Aviation Administration’s 2021 Airman Certification Standards.

5. Demonstrate required knowledge, risk management, and skills competencies for Aircraft Materials, Hardware, and Processes, General Curriculum Subject E 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 150 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. Mathematics

A. Knowledge

AM.I.H.K1, Areas of various geometrical shapes

AM.I.H.K2, Volumes of various geometrical shapes

AM.I.H.K3, Definitions, descriptions and use of geometrical terms

AM.I.H.K4, Ratio problems and their application to aircraft maintenance or system(s) operation

AM.I.H.K5, Proportion and percentage problems and their application to aircraft maintenance or system(s) operation.

AM.I.H.K6, Algebraic operations and their application to aircraft maintenance

AM.I.H.K7, Matric conversions

AM.I.H.K8, Scientific (exponential) notation, decimal notation, fractional notation, binary notation, and their interconversion

AM.I.H.K9, Rounding numbers

AM.I.H.K10, Powers and special powers

AM.I.H.K11, Measurement systems

AM.I.H.K12, Use of positive and negative integers in mathematical operations

AM.I.H.K13, Basic mathematic functions (addition, subtraction, multiplication, division).

B. Risk Management

AM.I.H.R1, Precedence of operations when solving an algebraic equation

AM.I.H.R2, Use of both positive and negative integers in mathematical operations

AM.I.H.R3, Rounding off calculations

C. Skills

AM.I.H.S1, Determine of the square root of given numbers

AM.I.H.S2, Compute the volume of a cylinder

AM.I.H.S3, Compute the area of a wing

AM.I.H.S4, Calculate the volume of a shape, such as a baggage compartment or fuel tank

AM.I.H.S5, Convert between fractional and decimal numbers

AM.I.H.S6, Compare two numerical values using ratios

AM.I.H.S7, Compute compression ratio

AM.I.H.S8, Compute the torque value when converting from inch-pounds to foot-pounds or from foot-pounds to inch-pounds.

II. Physics

A. Knowledge

AM.I.J.K1, Matter and energy.

AM.I.J.K2, Work, power, force, and motion.

AM.I.J.K3, Simple machines and mechanics.

AM.I.J.K4, Heat and pressure.

AM.I.J.K5, Bernoulli’s Principle.

AM.I.J.K6, Newton’s Law of Motion.

AM.I.J.K7, Gas law and fluid mechanics.

AM.I.J.K8, Theory of flight (aerodynamics).

AM.I.J.K9, Standard atmosphere and factors affecting atmospheric conditions.

AM.I.J.K10, Primary and secondary aircraft flight controls.

AM.I.J.K11, Additional aerodynamic devices, including vortex generators, wing fences, and stall strips

AM.I.J.K12, Relationship between temperature, density, weight, and volume.

AM.I.J.K13, Force, area, or pressure in a specific application.

B. Risk Management

AM.I.J.R1, Changes in aircraft and engine performance due to density altitude.

AM.I.J.R2, Effect a repair can have on a flight surface.

AM.I.J.R3, Use of performance/testing data.

AM.I.J.R4, Use of related units of measure (e.g., Celsius vs. Fahrenheit).

C. Skills

AM.I.J.S1, Convert temperature units (e.g., from Celsius to Fahrenheit).

AM.I.J.S2, Determine density altitude

AM.I.J.S3, Determine pressure altitude

AM.I.J.S4, Calculate force, area, or pressure in a specific application

AM.I.J.S5, Demonstrate the mechanical advantage of various types of levers

AM.I.J.S6, Design an inclined plane on paper, indicating the mechanical advantage

AM.I.J.S7, Identify changes in pressure and velocity as a fluid passes through a venture tube

AM.I.J.S8, Calculate horsepower

III. Aircraft Drawings

A. Knowledge

AM.I.B.K1, Drawings, blueprints, sketches, charts, graphs, and system schematics, including commonly used lines, symbols, and terminology

AM.I.B.K2, Repair or alteration of an aircraft system or component(s) using drawings, blueprints, or system schematics to determine whether it conforms to its type design

AM.I.B.K3, Inspection of an aircraft system or component(s) using drawings, blueprints, or system schematics

AM.I.B.K4, Terms used in conjunction with aircraft drawings, blueprints, or system schematics

B. Risk Management

AM.I.B.R1, Interpretation of plus or minus tolerances as depicted on aircraft drawings

AM.I.B.R2, Specifications for design of alterations and repairs

AM.I.B.R3, Applicability of the drawing or schematic to the particular aircraft by model and serial number

AM.I.B.R4, Identification of the current version and applicability of drawing being used

C. Skills

AM.I.B.S1, Draw a sketch of a repair or alteration

AM.I.B.S2, Identify the meaning of lines and symbols used in an aircraft drawing

AM.I.B.S3, Interpret dimensions used in an aircraft drawing

AM.I.B.S4, Identify changes on an aircraft drawing

AM.I.B.S5, Determine material requirements from an aircraft drawing

AM.I.B.S6, Interpret graphs and charts

IV. Fluid Lines and Fittings

A. Knowledge

AM.I.D.K1, Tubing and hose materials, applications, sizes, and fittings

AM.I.D.K2, Rigid line or flexible hose material identification

AM.I.D.K3, Rigid line fabrication, installation, and inspection techniques/practices

AM.I.D.K4, Flexible hose fabrication, installation, and inspection techniques/practices

AM.I.D.K5, Importance of using a torque wrench when securing fluid hose and line fittings

AM.I.D.K6, Use of torque seal or similar witness techniques after installing critical fluid hose and line fittings

B. Risk Management

AM.I.D.R1, System configuration prior to and during maintenance

AM.I.D.R2, Use of required safety equipment

AM.I.D.R3, Hazardous fluids

AM.I.D.R4, High-pressure fluid systems

AM.I.D.R5, A twisted hose

AM.I.D.R6, A loosened fitting or a hose that has moved out of position

AM.I.D.R7, Use of tools while applying torque to a fluid line

C. Skills

AM.I.D.S1, Fabricate a rigid line with a flare and a bend

AM.I.D.S2, Install an aircraft rigid line

AM.I.D.S3, Install an aircraft flexible hose

AM.I.D.S4, Perform a rigid line or flexible hose inspection

AM.I.D.S5, Identify installation and security requirements for rigid lines and flexible hoses

AM.I.D.S6, Identify fluid lines, pneumatic lines, and fittings

AM.I.D.S7, Fabricate a flexible hose

AM.I.D.S8, Fabricate a flareless-fitting-tube connection

V. Aircraft Materials, Hardware, and Processes

A. Knowledge

AM.I.E.K1, Materials commonly used in aircraft and their general application

AM.I.E.K2, Heat treatment and metal working processes

AM.I.E.K3, Forces placed on aircraft materials (e.g., tension, compression, torsion, bending, strain, and shear)

AM.I.E.K4, Hardware commonly used in aircraft (e.g., bolts, nuts, screws, pins, washers, turnlock fasteners, cables, cable fittings, and rigid line couplings)

AM.I.E.K5, Safety wire and safety clip requirements and techniques

AM.I.E.K6, Precision measurement tools, principles, and procedures

AM.I.E.K7, Soldering preparation, types of solder, and flux usage

AM.I.E.K8, Torquing tools, principles, and procedures

AM.I.E.K9, Suitability and compatibility of materials and hardware used for maintenance

AM.I.E.K10, Relationship between torque and fastener preload

AM.I.E.K11, Identification markings on materials and hardware

AM.I.E.K12, Characteristics of acceptable welds

AM.I.E.K13, Characteristics of unacceptable welds

AM.I.E.K14, Procedures for weld repair

B. Risk Management

AM.I.E.R1, Use of personal protective equipment (PPE)

AM.I.E.R2, Improper torque

AM.I.E.R3, Used hardware or suspected unapproved parts (SUPS)

AM.I.E.R4, Torquing techniques on critical, highly-stressed fastener

C. Skills

AM.I.E.S1, Install safety wire on nuts, bolts, and turnbuckles

AM.I.E.S2, Determine and properly torque aircraft hardware

AM.I.E.S3, Inspect and check welds

AM.I.E.S4, Identify aircraft materials and hardware based on manufacturer’s markings

AM.I.E.S5, Select and install aircraft bolts

AM.I.E.S6, Make precision measurements with an instrument that has a Vernier scale

AM.I.E.S7, Check the concentricity of a shaft

AM.I.E.S8, Identify aircraft control cable components

AM.I.E.S9, Fabricate a cable assembly using a swaged-end fitting

AM.I.E.S10, Select the correct aluminum alloy for a structural repair

AM.I.E.S11, Identify rivets by physical characteristics

AM.I.E.S12, Determine suitability of materials for aircraft repairs

AM.I.E.S13, Distinguish between heat-treated and non-heat-treated aluminum alloys

AM.I.E.S14, Check for proper calibration of a micrometer