# 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:** Powerplant Systems

**BRCC Course Rubric:** AMTP 1126

**Previous Course Rubric**: AMTP 102

**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 Engine Inspection, Engine Fuel and Fuel Metering Systems, and Propellers. This course covers Powerplant Curriculum Subjects from the Federal Aviation Administration’s 2021 Airman Certification Standards. This course requires a lab fee.

**Prerequisites:**  AMTG 1016 and AMTG 1026

**Co-requisites:** AMTP 1116

**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 Engine Inspection, Powerplant Curriculum Subject C in the Federal Aviation Administration’s 2021 Airman Certification Standards.

2. Demonstrate required knowledge, risk management, and skills competencies for Engine Fuel and Fuel Metering Systems, Powerplant Curriculum Subject I in the Federal Aviation Administration’s 2021 Airman Certification Standards.

3. Demonstrate required knowledge, risk management, and skills competencies for Propellers, Powerplant Curriculum Subject M 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. Engine Inspection

A. Knowledge

AM.III.C.K1, Inspection requirements under 14 CFR PART 43 and 14 CFR Part 91.

AM.III.C.K2, Identification of life-limited parts and their replacement interval.

AM.III.C.K3, Special inspections.

AM.III.C.K4, Use of FAA-approved data.

AM.III.C.K5, Compliance with service letters, service bulletins, or instructions for continued airworthiness, ADs, or TCDSs.

AM.III.C.K6, Maintenance recordkeeping requirements under 14 CFR Part 43.

AM.III.C.K7, Engine component inspection, checking, and servicing.

AM.III.C.K8, Engine mounts, mounting hardware, and the inspection and checking of each.

B. Risk Management

AM.III.C.R1, A compression test on a reciprocating engine.

AM.III.C.R2, Maintenance on an operating reciprocating engine.

AM.III.C.R3, Maintenance on an operating turbine engine.

C. Skills

AM.III.C.S1, Perform a compression check on a cylinder.

AM.III.C.S2, Evaluate powerplant for compliance with FAA-approved or manufacturer data.

AM.III.C.S3, Perform a powerplant records inspection.

AM.III.C.S4, Inspect for compliance with applicable ADs.

AM.III.C.S5, Determine engine installation eligibility.

AM.III.C.S6, Determine compliance with engine specifications, TCDS, or engine listings.

AM.III.C.S7, Perform a portion of a required inspection on an engine.

AM.III.C.S8, Check engine controls for proper operation and adjustment.

AM.III.C.S9, Inspect an engine for leaks after performing maintenance.

AM.III.C.S10, Inspect an aircraft engine accessory for serviceability.

AM.III.C.S11, Inspect engine records for time or cycles on life-limited parts.

AM.III.C.S12, Perform an engine start and inspect engine operational parameters.

AM.III.C.S13, Perform a portion of a 100-hour inspection on an engine in accordance with Part 43.

AM.III.C.S14 3 C S 14 Inspect an engine mount to determine serviceability.

II. Engine Fuel and Fuel Metering Systems

A. Knowledge

AM.III.I.K1, Fuel/air ratio and fuel metering, and carburetor theory and operation.

AM.III.I.K2, Float carburetor theory, components, operation, and adjustment.

AM.III.I.K3, Pressure carburetor theory, operation, and adjustment.

AM.III.I.K4, Continuous-flow fuel injection theory, components, operation, troubleshooting and adjustment.

AM.III.I.K5, Digital engine control module (e.g., FADEC).

AM.III.I.K6, Hydromechanical fuel control system design and components.

AM.III.I.K7, Fuel nozzles and manifolds design, operation, and maintenance.

AM.III.I.K8, Components, theory, and operation of turbine engine fuel metering system.

AM.III.I.K9, Inspection requirements for an engine fuel system.

AM.III.I.K10, Fuel system operation.

AM.III.I.K11, Fuel heaters.

AM.III.I.K12, Fuel lines.

AM.III.I.K13, Fuel pumps.

AM.III.I.K14, Fuel valves.

AM.III.I.K15, Fuel filters.

AM.III.I.K16, Engine fuel drains.

B. Risk Management

AM.III.I.R1, Adjusting a turbine engine fuel control.

AM.III.I.R2, Adjusting reciprocating engine fuel control systems.

AM.III.I.R3, Handling of fuel metering system components that may contain fuel.

AM.III.I.R4, Considerations during fuel system maintenance.

AM.III.I.R5, Handling of engine fuel control units that may contain fuel.

C. Skills

AM.III.I.S1, Inspect, troubleshoot, and repair a continuous-flow fuel injection system.

AM.III.I.S2, Remove, inspect, and install a turbine engine fuel nozzle.

AM.III.I.S3, Identify carburetor components.

AM.III.I.S4, Identify fuel and air flow through a float-type carburetor.

AM.III.I.S5, Remove and install a carburetor main metering jet.

AM.III.I.S6, Inspect a carburetor fuel inlet screen.

AM.III.I.S7, Adjust a continuous-flow fuel injection system.

AM.III.I.S8, Inspect the needle, seat, and float level on a float-type carburetor.

AM.III.I.S9, Remove and install a float-type carburetor.

AM.III.I.S10, Adjust carburetor idle speed and mixture.

AM.III.I.S11, Locate procedures for a turbine engine revolutions per minute (rpm) overspeed inspection.

AM.III.I.S12, Inspect fuel metering cockpit controls for proper adjustment.

AM.III.I.S13, Locate procedures for adjusting a hydromechanical fuel control unit.

AM.III.I.S14, Locate and explain procedures for removing and installing a turbine engine fuel control unit.

AM.III.I.S15, Identify components of an engine fuel system.

AM.III.I.S16, Remove and install an engine-driven fuel pump.

AM.III.I.S17, Inspect a remotely-operated fuel valve for proper operation.

AM.III.I.S18, Locate and identify fuel selector placards.

AM.III.I.S19, Inspect a main fuel filter assembly for leaks.

AM.III.I.S20, Inspect fuel boost pump.

AM.III.I.S21, Locate and identify a turbine engine fuel heater.

AM.III.I.S22, Inspect fuel pressure warning light function.

AM.III.I.S23, Adjust fuel pump fuel pressure.

AM.III.I.S24, Inspect engine fuel system fluid lines and components.

AM.III.I.S25, Troubleshoot abnormal fuel pressure.

AM.III.I.S26, Locate the procedures for troubleshooting a turbine engine fuel heater system.

AM.III.I.S27, Remove, clean, and reinstall an engine fuel filter.

AM.III.I.S28, Troubleshoot engine fuel pressure fluctuation.

AM.III.I.S29, Inspect fuel selector valve.

AM.III.I.S30, Determine correct fuel nozzle spray pattern.

III. Propellers

A. Knowledge

AM.III.M.K1, Propeller theory and operation.

AM.III.M.K2, Types of propellers and blade design.

AM.III.M.K3, Pitch control and adjustment.

AM.III.M.K4, Constant speed propeller and governor theory and operation.

AM.III.M.K5, Turbine engine propeller reverse/beta range operation.

AM.III.M.K6, Propeller servicing, maintenance, and inspection requirements.

AM.III.M.K7, Procedures for removal and installation of a propeller.

AM.III.M.K8, Propeller TCDS.

AM.III.M.K9, Propeller synchronization systems.

AM.III.M.K10, Propeller ice control systems.

B. Risk Management

AM.III.M.R1, Ground operation.

AM.III.M.R2, Propeller maintenance and inspections.

C. Skills

AM.III.M.S1, Remove and install a propeller.

AM.III.M.S2, Check blade static tracking.

AM.III.M.S3, Inspect a propeller for condition and airworthiness.

AM.III.M.S4, Measure propeller blade angle.

AM.III.M.S5, Perform a minor repair to a metal propeller blade.

AM.III.M.S6, Perform propeller lubrication.

AM.III.M.S7, Locate and explain the procedures for balancing a fixed-pitch propeller.

AM.III.M.S8, Adjust a propeller governor.

AM.III.M.S9, Identify propeller range of operation.

AM.III.M.S10, Perform a 100-hour inspection of a propeller and determine airworthiness.

AM.III.M.S11, Determine what minor propeller alterations are acceptable using the propeller specifications, TCDS, and listings.

AM.III.M.S12, Inspect and repair a propeller anti-icing or de-icing system.