**I. COURSE TITLE:** Aircraft Fuel Metering

 **COURSE NUMBER:** 2353 **CATALOG PREFIX:** AVIT

**II. PREREQUISITE(S):**

**III. CREDIT HOURS:** 5 **LECTURE HOURS:** 3

 **LABORATORY HOURS:** 2 (2 contact) **OBSERVATION HOURS:**

**IV. COURSE DESCRIPTION:**

This course will introduce the student to aircraft fuel systems used on reciprocating and turbine aircraft engines. Students will inspect, check, service, troubleshoot, and repair float carburetors, pressure carburetors, fuel injection, and turbine fuel control units.

**V. ADOPTED TEXT(S):**

Jeppesen Maintenance

 A&P Technician

Powerplant Textbook

**VI. COURSE OBJECTIVES:**

Students will be able to:

• Troubleshoot and adjust turbine engine fuel metering systems and

 electronic engine fuel controls (1)

• Overhaul carburetor (2)

• Repair engine fuel metering system components (2)

• Inspect, check, service, troubleshoot, and repair reciprocating and turbine

 engine fuel metering systems (3)

 Objective levels:

Level 1 requires:

Knowledge of general principles, but no practical application.

No development of manipulative skill.

Instruction by lecture, demonstration, and discussion.

Level 2 requires:

Knowledge of general principles, and limited practical application.

Development of sufficient manipulative skill to perform basic operations. Instruction by lecture, demonstration, discussion, and limited practical application.

Level 3 requires:

Knowledge of general principles, and performance of a high degree of practical application.

Development of sufficient manipulative skills to simulate return to service.

Instruction by lecture, demonstration, discussion, and a high degree of practical application.

**VII. COURSE METHODOLOGY:**

May include but not limited to Lecture and problem solving, independent and group projects, in-class and home assignments, quizzes, and tests. Problem solving will use both graphical and mathematical methods.

Attendance is required.

**VIII. GRADING**

A= 90-100

 B= 80-89

 C= 70-79

 D= 60-69

 F= 0-59

Grades of 69 and below will not meet the requirements of the FAA for Mechanic

Certificate .

See catalog for description of other possible grades.

**IX. COURSE OUTLINE:**

Weeks:

1. Reciprocating engine fuels, fuel system requirements.

2. Reciprocating engine fuel systems, gravity-feed systems, pressure-feed systems, fuel system components.

3. Turbine fuel systems, turbine fuels and additives, engine-driven pumps, fuel heater, fuel filters, water injection.

4. Types of metering devices for reciprocating engines, metering principles, fuel/air chemistry, mixture ratio terminology, leaning techniques, specific fuel consumption, detonation and preignition, backfire and afterfire, carburetors, carburetor systems.Test 1

5. Float-type carburetors, main metering.

6. Idling system, mixture control, acceleration system.

7. Power enrichment/economizer system, carburetor limitations, float-type carburetor maintenance, idle mixture adjustments, idle speed adjustment.

8. Carburetor overhaul.

Test 2

9. Pressure-injection carburetors, main metering, mixture control, acceleration system, power enrichment system.

10. Water injection, pressure carburetor maintenance, carburetor overhaul, fuel injection systems, RSA system, fuel metering unit.

11. Fuel regulator, idle system, automatic mixture control, flow divider, injection nozzles, RSA system inspection and maintenance, field adjustments.

12. Teledyne continental system, injector pump, fuel/air control unit.

Test 3

13. Fuel manifold valve, injector nozzles, inspection and maintenance, field adjustments, troubleshooting, overhaul.

14. Turbine engine fuel metering devices, fuel control units, fuel metering section, computing section, hydro-pneumatic.

15. Electronic fuel control, supervisory EEC, full-authority EEC, fuel nozzles, atomizing nozzles, simplex nozzle, duplex nozzle, vaporizing nozzles, nozzle malfunctions, pressurization and dump valve, drain valves, turbine fuel control maintenance.

16. Final exam.

**X. OTHER REQUIRED TEXTS, SOFTWARE, AND MATERIALS:**

FAA AC-65-12A

Airframe and Powerplant Mechanics

Powerplant Handbook

 FAA-AC-43.13-1B/2B

Acceptable methods, Techniques, and practices of aircraft inspection and Repair

**XI. EVALUATION:**

Test count – 40% of Final Grade

 Quizzes count – 10% of Final Grade

 Lab Grade counts – 50% of Final Grade

**XII. SPECIFIC MANAGEMENT REQUIREMENTS:**

Class and lab attendance is mandatory. Students are required to be in class and lab to satisfy the time requirement of the FAA. Quizzes cannot be made up. No test can be taken late without prior approval of the instructor.

**XIII. OTHER INFORMATION:**

**FERPA:** Students need to understand that your work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**DISABILITIES:** Students with disabilities may contact the Disabilities Service Office, Central Campus, at 800-628-7722 or 937-393-3431.