**I. COURSE TITLE:** Aircraft Landing Gear and Fluid Power

 **COURSE NUMBER:** 2233 **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 hydraulic, pneumatic, and landing gear system used in a variety of different types of aircraft. Students will inspect, check, service, and repair aircraft landing gear systems and their component. Student will remove, disassemble, inspect, and replace hydraulic and pneumatic systems components used in different aircraft systems.

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

Jeppesen Maintenance

 A&P Technician

Airframe Textbook

**VI. COURSE OBJECTIVES:**

Students will be able to:

• Inspect, check, service, and repair landing gear, retraction systems, shock

 struts, brakes, wheels, tires, and steering systems (3)

• Repair hydraulic and pneumatic power systems components (2)

• Identify and select appropriate hydraulic fluids (3)

• Inspect, check, service, troubleshoot, and repair hydraulic and pneumatic

 power 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 included but not limited to lecture and problems solving, group and lab projects, in-class and home assignments, quizzes and tests. Lab project will be individual and group. Attendance to class and lab 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. Static fluid pressure, Pascal's law, relationship between pressure-force- area, relationship between area-distance-volume, mechanical advantage in hydraulic systems.

2. Hydraulic fluid, viscosity, flash point, fire point, types of hydraulic fluid, basic hydraulic systems, open hydraulic systems, closed hydraulic systems.

3. Basic aircraft hydraulic systems, double-acting actuators, two-way selector valves, engine-driven pump and pump-control valve, hand pump and standpipe, filters and thermal relief valves, open-center systems, hydraulic power pack systems.

4. Hydraulic system components, reservoirs, filters, pumps, valves.

Test 1

5. Hydraulic fuses, pressure regulators, pressure reducers, accumulators.

6. Air valves, actuators, seals, large-aircraft hydraulic systems.

7. Aircraft pneumatic systems, high-pressure systems, medium-pressure systems, low-pressure systems.

8. Pneumatic system components, relief valves, control valves, check valves, moisture separators, filters, shuttle valves, emergency backup systems.

Test 2

9. Landing gear types, landing gear arrangement, fixed or retractable landing gear, shock absorbing and non-absorbing landing gear, aircraft wheels.

10. Wheel inspection, nose wheel steering systems on small and large aircraft, shimmy dampers, landing gear alignment, support and retraction for small aircraft.

11. Landing gear alignment, support and retraction for large aircraft, emergency extension systems, landing gear safety devices, landing gear rigging and adjustment.

12. Types of aircraft brakes, brake construction, brake actuating systems, emergency brake system.

Test 3

13. Brake inspection and service, off aircraft servicing, replacement of brake linings.

14. Brake malfunctions and damage, anti-skid brake control systems, tire classification, tire types, tire construction.

15. Tire inspection on the aircraft, tire removal, tire inspection off of the aircraft, tire repair and retreading, tire storage, aircraft tubes, tire mounting, tire balancing.

16. Final exam

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

FAA AC-65-15A

Airframe and Powerplant Mechanics

Airframe 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.