**I. COURSE TITLE:** Aircraft Materials, Processes and Fluid Lines

 **COURSE NUMBER:** 1113 **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 the hardware used to build aircraft. The student will use basic hand tools and measuring devices to fabricate rigid and flexible fluid lines. The student will identify appropriate uses for industry standard nondestructive testing including dye penetrant, eddy current, ultrasonic and magnetic particle inspection.

**V. 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.

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

Jeppesen Maintenance

 A&P Technician

General Textbook

Jeppesen Maintenance

 A&P Technician

General Workbook

**VII. COURSE OBJECTIVES:**

Students will be able to:

• Perform precision measurements (3)

• Identify and select aircraft hardware and materials (3)

• Perform basic heat-treating processes (1)

• Inspect and check welds (3)

• Identify and select nondestructive testing methods (1)

• Perform dye penetrant, eddy current, ultrasonic and magnetic particle

 inspections (2)

• Fabricate and install rigid and flexible aircraft fluid lines and fittings (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.

**VIII. 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.

**IX. COURSE OUTLINE:**

Weeks:

1. Hand tools, files, punches, saws, drills, reamers, taps and dies.
2. Screwdrivers, wrenches, sockets, impact tools, torque wrenches, layout tools, micrometers, verniers, dial indicators.
3. Properties of metal, metal working process, heat treatment, strain hardening, aluminum alloys, magnesium alloys, titanium alloys, nickel alloys, steel alloys, stainless steel.
4. Heat treatment of steel, case hardening, Brinell and Rockwell hardness system.

Test 1

1. Aircraft woods, plastics, epoxies, seals, gaskets, sealing compounds.
2. Aircraft rivets, special aircraft rivets.
3. Special aircraft fasteners, aircraft bolts.
4. Aircraft nuts, anchor nuts, screws.

Test 2

1. Aircraft pins, washers, heli-coils, turn lock fasteners.
2. Aircraft control cables and terminals, turnbuckles, safety wiring.
3. Rigid fluid lines, tube bending, tube flaring, fittings, flareless fittings, rigid tubing installation.

12. Identification of fluid lines, flexible fluid lines, types of flexible lines, swaged fittings, reusable fittings, flexible hose installation.

 Test 3

13. Non-destructive testing, visual inspection, weld inspection, liquid penetrant inspections.

14. Magnetic particle inspection.

15. Eddy current inspection, ultrasonic inspection, radiographic inspection, composite inspection.

16. Final Exam

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

FAA-H-8083-30

 Aviation Maintenance Technician 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.