**I. COURSE TITLE:** Aircraft Assembly and Rigging

 **COURSE NUMBER:** 2243 **CATALOG PREFIX:** AVIT

**II. PREREQUISITE(S):**

**III. CREDIT HOURS:** 4 **LECTURE HOURS:** 3

 **LABORATORY HOURS:** 1 (2 contact) **OBSERVATION HOURS:**

**IV. COURSE DESCRIPTION:**

This course will introduce the student to aircraft assembly and rigging of the wings, tail, and flight controls. Students will disassemble an entire aircraft, removing primary and secondary flight controls, empennage and wing assemblies. Students will balance all primary flight controls. Students will reassemble aircraft and rig aircraft for flight in accordance with the manufacture’s data.

**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

Airframe Textbook

**VII. COURSE OBJECTIVES:**

Students will be able to:

• Rig rotary-wing aircraft (1)

• Rig fixed-wing aircraft (2)

• Check alignment of structures (2)

• Assemble aircraft components, including flight control surfaces (3)

• Balance, rig, and inspect movable primary and secondary flight control

 surfaces (3)

• Jack aircraft (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. Structural designs, types of aircraft structures, airfoil sections.

2. Truss-type wing construction, stressed-skin wing construction.

3. Control surface construction, airfoil control and aerodynamic configurations, ailerons, spoilers, flaperons and ruddervators, winglets, vortex generators, empennage structures.

4. Fuselage structures, truss-type fuselage, stressed-skin fuselage, pressurized fuselage, landing gear, water operations, snow operations, powerplant support structures, access and inspection.

Test 1

5. Airplane axis, stability and control, conditions of stability, types of stability, stability about the axis.

6. Control systems, longitudinal controls, lateral controls, directional controls.

7. Flight control surfaces, tabs.

8. Supplemental lift-modifying devices, four different types of flaps.

9. The flight controls of a large commercial aircraft.

Test 2

10. Helicopter aerodynamics, main rotor systems, anti-torque systems, helicopters with two main rotors.

11. Helicopter axis of flight, helicopters in flight, hovering.

12. Forward flight, blade flapping, advancing blade and retreating blade problems, autorotation.

13. High-speed aerodynamics, the speed of sound, shock waves.

14. Cables, cable ends, fabricating cables, test cables, rigging flight controls and cables.

15. Rigging of the various flight control systems, three major steps of aircraft rigging.

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.