**I. COURSE TITLE:** Airframe Electrical Systems

 **COURSE NUMBER:** 2232 **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 components and techniques used in aircraft airframe wiring. The students will learn basic aircraft wiring and installation of wiring components. Students will investigate and understand how to determine wire size, wire load, circuit components, methods of wiring aircraft for 12 volt DC, 24 volt DC and 115 volt AC systems. Students will crimp, splice, and solder using the methods developed for aircraft to inspect, repair, and fabricate aircraft wiring systems.

**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:

• Repair and inspect aircraft electrical system components; crimp and

 splice wiring to manufacturers' specifications; and repair pins and sockets

 of aircraft connectors (2)

• Install, check, and service airframe electrical wiring, controls, switches,

 indicators, and protective devices (3)

• Inspect, check, troubleshoot, service, and repair alternating and direct

 current electrical systems (3)

• Inspect, check, and troubleshoot constant speed and integrated speed

 drive generators (1)

 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. Generators, DC generator construction.

2. Types of DC generators, starter generators, armature reaction, generator ratings, generator terminals, generator voltage regulation.

3. Wire types, wire size, wire marking, wiring installation, open wiring, wire routing and clamping, wire conduit, wire shielding, wiring terminals.

4. Connectors, splicing repairs, terminal strips, junction boxes, bonding, coaxial cable.

Test 1

5. Switches, switch installation, toggle and rocker switches, rotary switches, precision (micro) switches, relays and solenoids, current limiting devices, fuses, circuit breakers, electrical control placards, exterior lights.

6. DC generator service and maintenance, generator overhaul.

7. Generator systems, alternators, DC alternators, alternator controls, DC alternator service and maintenance, AC alternators, brushless alternators.

8. Alternator ratings, frequency, CSD’s, IDG’s, AC alternator maintenance, lead-acid battery, battery ratings, battery servicing and charging.

Test 2

9. Battery installation, nickel-cadmium batteries.

10. Battery circuit, generator circuit, alternator circuit, external power circuit, starter circuit, avionics power circuit, landing gear circuit.

11. Alternating current supply, small multi-engine aircraft electricity, paralleling with vibrator-type voltage regulators, paralleling with carbon-pile voltage regulators, paralleling twin-engine alternator systems.

12. Large multi-engine aircraft electricity, split-bus and the parallel system, AC alternator drive, generator instrumentation and controls, automated AC power systems, bite, LRU’s, ESDs.

Test 3

13. Position lights, anti-collision lights, landing and taxi lights, wing inspection lights, interior lights, fluorescent lights, maintenance and inspection of lighting systems.

14. DC motors, types of DC motors, inspection and maintenance of DC motors.

15. AC motors.

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.