1. **COURSE TITLE\*: Airframe Electricity and Fire Protection**
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*: AVIT 2303**
3. **PREREQUISITE(S)\*: COREQUISITE(S)\*:**
4. **COURSE TIME/LOCATION/MODALITY: (*Course Syllabus – Individual Instructor Specific*)**
5. **CREDIT HOURS\*: 4 LECTURE HOURS\*: 3**

**LABORATORY HOURS\*: 1 (2 contact hrs) OBSERVATION HOURS\*:0**

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

This course will introduce the student to the components and techniques used in aircraft airframe wiring and fire protection systems. 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 12volt DC, 24volt DC and 115volt AC systems. Students will crimp, splice, and solder using the methods developed for aircraft to inspect, repair, and fabricate aircraft wiring systems. The student will understand different fire protection system operations and troubleshooting.

1. **LEARNING OUTCOMES\*:**

Students will have knowledge of the following:

1. Generators, DC generation systems, and DC power distribution systems.
2. Alternators, AC generation systems, and AC power distribution systems.
3. Starter generators.
4. Constant speed drive (CSD) and integrated drive generator (IDG) systems and components.
5. Voltage regulators and over-volt and overcurrent protection.
6. Inverter systems.
7. Aircraft wiring sizes, types, selection, installation and circuit protection devices.
8. DE rating factors in switch selection.
9. Aircraft wiring shielding.
10. Aircraft lightning protection.
11. Instrument or instrument panel removal and installation.
12. Aircraft lighting systems.
13. Electrical system troubleshooting.
14. Soldering preparation, types of solder, and flux usage.
15. Types of fires and aircraft fire zones.
16. Overheat and fire detection and warning systems.
17. Overheat and fire detection system maintenance and inspection.
18. Smoke and carbon monoxide detection systems.
19. Fire extinguishing agents.
20. Types of fire extinguishing systems.
21. Fire extinguishing system maintenance and inspection requirements.
22. **ADOPTED TEXT(S)\*:**

FAA-H-8083-31

Aviation Maintenance Technician Handbook

**9a: SUPPLEMENTAL TEXTS APPROVED BY FULL TIME DEPARTMENTAL FACULTY (INSTRUCTOR MUST NOTIFY THE BOOKSTORE BEFORE THE TEXTBOOK ORDERING DEADLINE DATE PRIOR TO ADOPTION) \*\*\*.**

1. **OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.)\*\***

FAA-AC-43.13-1B/2B Acceptable methods, Techniques, and practices of aircraft inspection and Repair

1. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

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.

1. **GRADING PROCEDURES OR ASSESSMENTS: (*Course Syllabus – Individual Instructor Specific)***

Test count – 40% of Final Grade

Quizzes count – 10% of Final Grade

Lab Grade counts – 50% of Final Grade

Class and lab attendance will be graded, two points will be deducted from the grade for each day missed. Quizzes cannot be made up. No test can be taken late without prior approval of the instructor.

1. **COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

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.

**14. COURSE OUTLINE: *(Course Syllabus – Individual Instructor Specific)***

***(Insert sample course outline with learning outcomes tied to assignments / topics.)***

**Below is an example of how you might fill-in the course outline of classwork, assignments, tests, et al…**

|  |  |  |
| --- | --- | --- |
| **WEEK** | **DESCRIPTION** | **LEARNING OUTCOMES #** |
| WEEK 1 | Generators, DC generator construction. | 1 |
| WEEK 2 | Types of DC generators, starter generators, armature reaction, generator ratings, generator terminals, generator voltage regulation. | 1 |
| WEEK 3 | Wire types, wire size, wire marking, wiring installation, open wiring, wire routing and clamping, wire conduit, wire shielding, wiring terminals. | 7, 18 |
| WEEK 4 | Connectors, splicing repairs, terminal strips, junction boxes, bonding, coaxial cable. | 7 |
| WEEK 5 | Quiz1  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. | 5, 15, 20 |
| WEEK 6 | DC generator service and maintenance, generator overhaul. | 1 |
| WEEK 7 | Generator systems, alternators, DC alternators, alternator controls, DC alternator service and maintenance, AC alternators, brushless alternators. | 3 |
| WEEK 8 | Alternator ratings, frequency, CSD’s, IDG’s, AC alternator maintenance, lead-acid battery, battery ratings, battery servicing and charging. | 4 |
| WEEK 9 | Test 1  Battery installation, nickel-cadmium batteries. | 5, 6 |
| WEEK 10 | Battery circuit, generator circuit, alternator circuit, external power circuit, starter circuit, avionics power circuit, landing gear circuit. | 8, 9 |
| WEEK 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. | 2 |
| WEEK 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. | 11, 13, 14 |
| WEEK 13 | Position lights, anti-collision lights, landing and taxi lights, wing inspection lights, interior lights, fluorescent lights, maintenance and inspection of lighting systems | 10, 12 |
| WEEK 14 | DC motors, types of DC motors, inspection and maintenance of DC motors. | 1, 16, 17 |
| WEEK 15 | AC motors | 2, 19, 21 |
| WEEK 16 | Final Exam |  |

* Generators, DC generator construction.
* Types of DC generators, starter generators, armature reaction, generator ratings, generator terminals, generator voltage regulation.
* Wire types, wire size, wire marking, wiring installation, open wiring, wire routing and clamping, wire conduit, wire shielding, wiring terminals.
* Connectors, splicing repairs, terminal strips, junction boxes, bonding, coaxial cable.
  + Quiz1
* 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.
* DC generator service and maintenance, generator overhaul.
* Generator systems, alternators, DC alternators, alternator controls, DC alternator service and maintenance, AC alternators, brushless alternators.
* Alternator ratings, frequency, CSD’s, IDG’s, AC alternator maintenance, lead-acid battery, battery ratings, battery servicing and charging.
  + Test 1
* Battery installation, nickel-cadmium batteries.
* Battery circuit, generator circuit, alternator circuit, external power circuit, starter circuit, avionics power circuit, landing gear circuit.
* 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.
* 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.
* Position lights, anti-collision lights, landing and taxi lights, wing inspection lights, interior lights, fluorescent lights, maintenance and inspection of lighting systems.
* DC motors, types of DC motors, inspection and maintenance of DC motors.
* AC motors.
  + Final exam

**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

Class and lab attendance will be graded. Quizzes cannot be made up. No test can be taken late without prior approval of the instructor.

**16. 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.

**17. ACCOMMODATIONS: \***

Students requesting accommodations may contact the Academic Affairs office administrative assistant, Barb Fleming, at bfleming@sscc.edu or 937-393-3431 X-2620.

Students seeking a religious accommodation for absences permitted under Ohio’s Testing Your Faith Act must provide the instructor and the Academic Affairs office with written notice of the specific dates for which the student requires an accommodation and must do so no later than fourteen (14) days after the first day of instruction or fourteen (14) days before the dates of absence, whichever comes first.  For more information about Religious Accommodations, see the full policy at <https://www.sscc.edu/services/accessibility-services.shtml#religious-accommodations>

or contact the Academic Affairs office administrative assistant, Barb Fleming, at [bfleming@sscc.edu](mailto:bfleming@sscc.edu) or 937-393-3431 X-2620.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.