AMT A160: AIRFRAME & POWERPLANT ELECTRICITY - FAA

Item	Value
Curriculum Committee Approval Date	12/08/2021
Top Code	095040 - Aircraft Electronics (Avionics)
Units	6 Total Units
Hours	216 Total Hours (Lecture Hours 72; Lab Hours 144)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S)

Course Description

Fundamental theory relating to aircraft electrical systems, ice and rain, and fire protection systems. Practical experience in disassembly, repair, overhaul, inspection, testing of electrical components and systems. ADVISORY: AMT A151. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Inspect, troubleshoot, and service AC, DC electrical systems, airframe electrical wiring and controls, and aircraft electrical components.
2. Inspect, troubleshoot and service aircraft position and warning system, and anti-skid electrical brake controls systems.
3. Inspect, check and troubleshoot airframe and powerplant fire detection and extinguishing systems.

Course Objectives

- 1. Install electrical terminals, splices, components to FAA specs.
- 2. Operate and perform inspections of aircraft lighting systems
- 3. Describe the operation of aircraft generators, alternators, and voltage regulators.
- 4. Explain the operation of an aircraft AC electrical system
- 5. Explain the operation of Aircraft position and warning systems.
- 6. Explain the operation and troubleshooting of aircraft and powerplant fire detection and extinguishing systems.
- 7. Explain the operation and troubleshooting of aircraft motors.
- 8. Demonstrate the troubleshooting of aircraft electrical circuits.
- 9. Explain the operation of various aircraft and powerplant electrical circuits using wiring diagrams.
- 10. Explain the operation and troubleshooting of aircraft ice and rain control systems
- 11. troubleshoot an aircraft dc electrical system fault
- 12. Perform terminal crimping to manufactures specs.

Lecture Content

AIRCRAFT ELECTRICAL SYSTEMS COMPONENTS Inspect, check, troubleshoot, service and repair alternating current and direct current electrical systems Methods of controlling output current and voltage of compound DC generators Check, troubleshoot and repair an aircraft dual DC generator electrical system Methods of providing AC in aircraft having only DC electrical system Troubleshoot and repair a DC electrical system supplied by an alternator Characteristics advantage or AC aircraft electrical systems Identify components and operating elements of a 208/115 volt AC aircraft electrical system Install, check, and service airframe electrical wiring controls, switches, indicators and protective devices Types and characteristics of aircraft fuses, circuit breakers and switches Installation requirements and characteristics for aircraft electrical switches and wiring to components Installation requirements and characteristics for aircraft electrical wiring systems and junction boxes Install electrical terminals, splicing and bonding jumpers Check and connect quick-disconnect plugs and receptacles Protect electrical emergency switches against accidental actuation Identify and describe characteristics of aircraft high tension and low tension electrical wiring Repair aircraft electrical system components Determine causes and effects of switch chatter in solenoids, switches and relays Inspect installation and check circuits or anti-collision and position lights Inspect, check and repair landing and taxi light installation Inspect, check, service and repair aircraft interior lighting installation Inspect, check, service and repair cockpit light and lighting circuits Inspect and check electrical equipment installation fo r integrity of mounting and connection Inspect, check and repair passenger call system Locate replacement procedures and part number for electrical component replacement ENGINE ELECTRICAL SYSTEMS Install, check, and service engine electrical wiring, controls, switches, indicators and protective devices Types, purposes, applicability and operation of electrical fuses, circuit breakers and switches used in engine electrical circuits Select and install aircraft electrical switches and wiring to engine electrical components Installation requirements and characteristics for aircraft electrical wiring systems and junction boxes Install electrical terminals, splices and bonding jumpers, and identify aircraft electrical cables Use of quick-disconnect electrical connectors and characteristics of high and low tension electrical wire Install and wire solenoid operated switches, determine causes and effects and solenoid switch chatter Repair engine electrical system components Use service manuals and parts catalogs to locate procedures for repair or replacement of engine electrical system components add to obtain part numbers for replacement parts Check, troubleshoot and repair an aircraft dual DC generator electrical system Determination of approximate, actual, and permissible continuous load on an aircraft electrical generating system Inspect, check and repair solenoid operated valves for engine pneumatic functions POSITION WARNING SYSTEMS Inspect, check, service speed and configuration of warning system and anti-skid electrical brake controls Principles of operation, inspection and checks of speed, and stall and take-off warning systems and anti-skid brake control systems Show simulated operation of anti-skid and take-off warning sys tem Inspect, check, troubleshoot, and service landing gear position indicating and warning system Inspect, check, troubleshoot, and service landing gear position indicating and warning systems ICE AND RAIN CONTROL Inspect, check, troubleshoot, service, and repair airframe ice and rain control systems Principles of installations, operations and checking deicing and anti-icing systems Replace, inspect and check operation of electrically operated air scoop and pitot static or static vent anti-icing FIRE PROTECTION SYSTEMS Inspect, check, and service smoke and carbon monoxide detection systems Principles and operation of smoke and carbon monoxide detectors Inspect, check, troubleshoot

and repair fire detection and extinguishing systems Inspect, check, troubleshoot and repair fire detection and extinguishing systems Select and operate fire extinguishers Check, troubleshoot and repair aircraft built-in fire extinguishing systems ENGINE FIRE PROTECTION SYSTEMS Inspect, check, service, troubleshoot and repair engine fire detection and extinguishing systems Inspect, check, troubleshoot and repair engine fire detection systems Inspect, check, service, troubleshoot and repair engine fire extinguishing systems

Lab Content

Faculty input required.

Method(s) of Instruction

- Lecture (02)
- Lab (04)

Instructional Techniques

1. Detailed multimedia/lectures of each topic covered. 2. Student feedback during each lecture. 3. Detailed illustrative discussion of textbook examples. 4. Concentration on schematic reading and system operation fault diagnosis. 5 Practical troubleshooting. 6. Laboratory exercises pertaining to subjects discussed during which students work individually or in small groups.

Reading Assignments

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Writing Assignments

Student must show proficiency in writing logbook entries using correct punctuation, sentence structure and readability.

Out-of-class Assignments

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Demonstration of Critical Thinking

Interview, list, multiple choice exams, and short answer.

Required Writing, Problem Solving, Skills Demonstration

Student must show proficiency in writing logbook entries using correct punctuation, sentence structure and readability.

Textbooks Resources

1. Required Eismin, Thomas R. . Aircraft Electricity Electronic,, 5th ed. New York: Glencoe/McGraw-Hill, 1994 Rationale: - 2. Required Jeppesen. AC43.13-1B2A, Acceptable Methods, Techniques, and Practices-Aircraft Inspection and Repair, ed. Superintendent of Documents; U.S. Government Printing Office, 2001 Rationale: latest 3. Required Kroes, Michael J., et al.. Aircraft Maintenance Repair,, 6th ed. New York: Glencoe/McGraw-Hill, 2007 4. Required Kroes, Michael J and Thomas Wild. Aircraft Powerplant, 7th ed. New York: Glencoe/McGraw-Hill, 1994 Rationale: - 5. Required interAct. Aircraft Speed and Configuration Warning and Antiskid Systems, 1st ed. Irvine: Integrated Logistical International, 0 Rationale: -