AMT A290: HELICOPTER MAINTENANCE

Item	Value
Curriculum Committee Approval Date	12/08/2021
Top Code	095010 - Aviation Airframe Mechanics
Units	4 Total Units
Hours	144 Total Hours (Lecture Hours 36; Lab Hours 108)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

Maintenance of helicopters, helicopter rotor systems, power trains, unique system features, instrumentation, and design construction. Practical experience in dismantling, inspection, repair, assembly, testing, and troubleshooting a variety of helicopters and system components. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Identify, locate and describe Helicopter systems and components.
2. Perform FAA required inspections, maintenance and operational checks as per the manufacturers instructions.

Course Objectives

- 1. Explain the helicopters theory of operation.
- 2. Identify different types of helicopter rotor systems.
- 3. Inspect a helicopters Rotor system using the manufactures criteria.
- 4. Demonstrate how to adjust the rotor to their proper “track”.
- 5. Locate and identify all the major components of the helicopters Rotor system.
- 6. Explain the procedure to balance the rotor head to manufactures standards.
- 7. Identify, troubleshoot, service and check helicopter systems and components.
- 8. Operate a helicopter at ground idle.
- 9. Locate and identify all the major components of the helicopters power system.
- 10. Prepare a helicopter for flight by performing a preflight inspection.
- 11. Locate and identify all the major components of the helicopters flight system.
- 12. Operate and demonstrate the helicopters avionic and communication systems.
- 13. Locate and identify all the major components of the helicopters accessory systems.

Lecture Content

The Helicopter and Its Use Recreation Commercial Logging Construction trade Corporate and Air Transport Principles of Flight Aerodynamic principles, effects on lift Forces on the rotor, thrust Dissymmetry of lift Rotor heads Blade tip stall Autorotation Ground resonance, stability Flight control Similarities of the Helicopter vs. Fixed Wing Aircraft Control surfaces Flight controls Helicopter Maintenance and Operation Tracking a rotor head Balancing a rotor system Helicopter systems Helicopters and Their Rotor Systems Rotor head maintenance Blade alignment Static rotor balance, vibration, tracking Spanwise balance Blade sweeping Electronic balancing Dampener maintenance, counterweight adjustment Autorotation adjustment. Helicopter Powerplants systems and differences Fixed wing powerplant modifications Installation, radial and opposed engines Cooling systems, correlation systems Turboshaft engines powerplants Tail Rotors Operation Tail rotor system Servicing Tail rotor track System rigging Helicopter Avionic and Communication Systems Mast and Flight Controls Mast Stabilizer bar and dampeners Swash plate Collective Cyclic Push-pull tubes, torque tubes, bellcranks Mixer box Gradient unit Control boosts Maintenance and inspection Control rigging Main Rotor Transmissions Engine-transmission couplings and drive shaft clutch Freewheeling units and sprag clutch Roller unit, torque meter and rotor brake Vibrations Mounting system Transmissions Airframes and Related 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.

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

Quizzes, midterm and final written examinations

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 Federal Aviation Administration. Rotocraft Flying Handbook: FAA - H808321, ed. Newark: Aviation Supplies and Academics Inc., 2000 Rationale: latest 2. Required Schafer, Joe. Helicopter Maintenance and Study Guide, ed. Englewood: Jepesen Sanderson, 1999 Rationale: -