Course Outline

COURSE: AMT 111    DIVISION: 50    ALSO LISTED AS:

TERM EFFECTIVE: Spring 2018    CURRICULUM APPROVAL DATE: 03/27/2017

SHORT TITLE: AIRFRAME STRUCTURES

LONG TITLE: Airframe Structures

<table>
<thead>
<tr>
<th>Units</th>
<th>Number of Weeks</th>
<th>Type</th>
<th>Contact Hours/Week</th>
<th>Total Contact Hours</th>
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<td>Lecture:</td>
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<td>Lab:</td>
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COURSE DESCRIPTION:

This course is an FAA Part 147 course designed to prepare the student for their FAA Airframe certificate. The course will provide the student with a thorough understanding of nonmetallic aircraft structures including wood, fabric, composite structures. Also the study of hydraulic and pneumatic power systems; landing gear systems; electrical systems; and assembly and rigging. Both theory and practical application to aircraft systems is taught. COREQUISITE: AMT 101, General Aircraft Technology. ADVISORY: Mathematics 430.

PREREQUISITES:

COREQUISITES:

AMT 101

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

02 - Lecture and/or discussion
03 - Lecture/Laboratory
04 - Laboratory/Studio/Activity

STUDENT LEARNING OUTCOMES:

4/12/2017
1. The student demonstrates the ability to meet the written test standards outlined in FAA AC 147-3 – Certification and Operation of Aviation Maintenance Technician Schools.
   Measure of assessment: Homework assignments, quizzes and written tests.
2. The student demonstrates the ability to meet the oral/practical test standards outlined in FAA AC 147-3 – Certification and Operation of Aviation Maintenance Technician Schools.
   Measure of assessment: Shop/lab projects and oral/practical demonstrations
3. Demonstrate the ability to inspect and determine if components and aircrafts meet airworthy standards outlined in FAA AC 43.13-1B – Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair.
   Measure of assessment: Shop/lab projects and oral/practical demonstrations

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS
Curriculum Approval Date: 03/27/2017

LECTURE CONTENT:

12.5 Hours
WOOD STRUCTURES
CONTENT: Including defects in wood, kinds of wood and service and repair of wood.
STUDENT PERFORMANCE OBJECTIVE: Select samples of wood that would be acceptable for repair of wood aircraft structures. Identify types of wood and describe the strength characteristics which influence the selection of such materials for repair of wood aircraft structures. Judge the suitability of substitute materials. Describe the kinds of glue and gluing techniques. Read drawings pertaining to repair of wood structures.
16.5 Hours
FABRIC COVERING
CONTENT: Including selecting and applying fabric and fiberglass covering materials; as well as inspecting, testing and repairing.
STUDENT PERFORMANCE OBJECTIVE: Identify fabrics and seams and describe the acceptable methods of applying fabric. Compare the samples of doped and sewed seams with the specifications appearing in the publications.
12 Hours
AIRCRAFT FINISHES
CONTENT: Study of aircraft paint, trim design and finishes.
STUDENT PERFORMANCE OBJECTIVE: Draw registration letters and numbers and describe the application of trim and methods of touching up paint. Recognize the kind of material that was originally applied as a finish and describe which finishing materials may be applied over the original finish.
33 Hours
LANDING GEAR SYSTEMS
CONTENT: Study of basic landing gear to complex retractable gear systems. Includes aircraft mechanical and hydraulic brake assemblies, power brakes and emergency brake systems.
STUDENT PERFORMANCE OBJECTIVE: Describe the procedures to be followed when storing tires and other rubber aircraft products. Identify components of the mechanical and hydraulic type brake assemblies. Describe the operation of power brakes and emergency brake systems. Describe the operation of an oleo shock strut. Describe the operation of power brake and emergency brake systems. Recognize probable causes of brake malfunctions.
24.5 Hours
ASSEMBLY AND RIGGING
CONTENT: Including fixed wing aircraft and rotary wing aircraft.
STUDENT PERFORMANCE OBJECTIVE: Use nomenclature applicable to fixed wing aircraft and rotary wing aircraft. Explain the aerodynamics of flight, interpret the theories and describe the design features related to lift, thrust, stability and control of fixed wing aircraft.
29 Hours
HYDRAULIC AND PNEUMATIC SYSTEMS
CONTENT: Aircraft basic hydraulics, study of hydraulic brake systems, anti-skid systems and pneumatic systems.

STUDENT PERFORMANCE OBJECTIVE: Identify and select hydraulic fluids. Explain the simulated operation of anti-skid takeoff warning systems. Interpret and describe the operation of a pneumatic power system. Solve problems involving force, areas and pressure. Interpret reference information pertaining to operation of a basic hydraulic system. Compare constant pressure and open center types of hydraulic systems. Identify and describe the operation of constant and variable displacement hydraulic pumps.

8 Hours

COMMUNICATIONS AND NAVIGATION

CONTENT: Study of autopilot and approach control systems.

STUDENT PERFORMANCE OBJECTIVE: Explain the purposes and operation of an autopilot system, including the operating principles of the sensing devices. Describe the purpose and operation of servos or servomotors. Describe the function of position transmitters and trim indicators and the purpose and operation of an approach control system. Discuss the FCC regulations pertaining to aircraft radio operation. Identify and describe the purpose of static dischargers.

7 Hours

FIRE

CONTENT: Study of aircraft fire detection and protection systems.

STUDENT PERFORMANCE OBJECTIVE: Describe how smoke is detected by photoelectric and visual methods. Explain how air sampling is accomplished for smoke detection. Discuss the uses of chemical type CO detector buttons. Select and operate fire extinguishers.

7 Hours

ICE AND RAIN CONTROL SYSTEMS

CONTENT: Study of ice and rain control systems.

STUDENT PERFORMANCE OBJECTIVE: Describe the principles of installation, operation, deicing and anti-icing systems.

6 Hours

AIRFRAME INSPECTION

CONTENT: Airframe conformity and airworthiness inspections.

STUDENT PERFORMANCE OBJECTIVE: Describe the procedures, nomenclature and technical terms used to perform a 100 hour or annual inspection.

2 Hours

Final

LAB CONTENT:

18 Hours

AIRCRAFT FINISHES

LAB PROJECTS: Apply trim, letters and touchup paint. Identify finishing materials and thinners. Prepare the surface for painting and apply primers and paints by spraying. Apply dope by brush and spray application. Apply surface tapes, drain grommets and reinforcing patches as a part of the doping procedure. Inspect finishes and recognize defects.

50 Hours

LANDING GEAR SYSTEMS

LAB PROJECTS: Clean an aircraft tire, removing oils and other deteriorating materials. Inspect, demount, repair and reinstall tires on wheels. Remove, inspect, service and reinstall a wheel assembly on the axle. Disassemble components and reassemble mechanical and hydraulic type brake assemblies. Replace a brake actuating cylinder. Adjust clearance on a shoe, multiple-disc and single-disc shoe. Inspect, repair and operationally check a master cylinder. Inspect and service the operation of power brakes and emergency brake systems. Bleed air from a hydraulic brake system. Service, repair and troubleshoot landing gear oleo struts. Operate, inspect and adjust a retractable landing gear. Check landing gear alignment. Inspect, adjust and service nose and tail wheel steering and damping mechanisms.

ASSEMBLY AND RIGGING

36.5 Hours

4/12/2017
LAB PROJECTS: Check and verify alignment of structures. Assemble aircraft components. Identify aircraft control cable. Install swaged cable terminals. Verify correct control response. Install and tension a control cable and inspect a control system. Check static balance of a control system. Inspect and adjust push-pull control systems. Utilize the appropriate equipment, ballast and follow procedures to raise and lower the aircraft.

43 Hours

HYDRAULIC AND PNEUMATIC SYSTEMS
LAB PROJECTS: Repair hydraulic and pneumatic power system components. Identify, remove and install a hydraulic selector valve. Remove and install pressure regulators. Inspect and service hydraulic reservoirs. Check, inspect, troubleshoot, remove and install hydraulic power pumps. Remove, install, inspect, service and check a hydraulic accumulator. Troubleshoot and determine the cause of low, high or fluctuating system hydraulic pressure. Inspect, check and service a hydraulically operated flap system.

12 Hours

COMMUNICATIONS AND NAVIGATION
LAB PROJECTS: Inspect, check and service aircraft electronic communication and navigational systems. Repair or replace aircraft antennas and related electronic equipment.

5 Hours

FIRE
LAB PROJECTS: Inspect, check, service, troubleshoot and repair aircraft fire detection and extinguishing systems. Select and operate fire extinguishers.

5 Hours

ICE AND RAIN CONTROL SYSTEMS
LAB PROJECTS: Inspect, check, troubleshoot, service and repair airframe ice and rain control systems. Replace, inspect and check operation of electrically operated air scoop and pilot static vent anti-icing.

14 Hours

AIRFRAME INSPECTION
LAB PROJECTS: Perform a 100 hour or annual inspection of the aircraft and record the conditions disclosed as a result of the inspection.

METHODS OF INSTRUCTION:
lecture, demonstration, audio-visual, guided practice

METHODS OF EVALUATION:
Writing assignments
Percent of total grade: 20.00 %
Percent range of total grade: 20 % to 40 % Written Homework Lab Reports Term or Other Papers
Problem-solving assignments
Percent of total grade: 15.00 %
Percent range of total grade: 15 % to 30 % Homework Problems Quizzes Exams
Skill demonstrations
Percent of total grade: 10.00 %
Percent range of total grade: 10 % to 20 % Class Performance/s
Objective examinations
Percent of total grade: 35.00 %
Percent range of total grade: 35 % to 50 % Multiple Choice True/False Matching Items

OUT OF CLASS ASSIGNMENTS:
Required Outside Hours: 3
Assignment Description:
WOOD STRUCTURES
Homework: Complete reading assignments and answer question sheets.
Required Outside Hours: 4
Assignment Description:
FABRIC COVERING
Homework: Complete reading assignments and answer question sheets.
Required Outside Hours: 5
Assignment Description:
AIRCRAFT FINISHES
Homework: Complete reading assignments and answer question sheets.
Required Outside Hours: 20
Assignment Description:
LANDING GEAR SYSTEMS
Homework: Complete reading assignments and answer question sheets.
Required Outside Hours: 15
Assignment Description:
ASSEMBLY AND RIGGING
Homework: Complete reading assignments and answer question sheets.
Required Outside Hours: 16
Assignment Description:
HYDRAULIC AND PNEUMATIC SYSTEMS
Homework: Complete reading assignments and answer question sheets.
Required Outside Hours: 5
Assignment Description:
COMMUNICATIONS AND NAVIGATION
Homework: Complete reading assignments and answer question sheets.
Required Outside Hours: 3
Assignment Description:
FIRE
Homework: Complete reading assignments and answer question sheets.
Required Outside Hours: 3
Assignment Description:
ICE AND RAIN CONTROL SYSTEMS
Homework: Complete reading assignments and answer question sheets.
Required Outside Hours: 5
Assignment Description:
AIRFRAME INSPECTION
Homework: Complete reading assignments and answer question sheets.

REPRESENTATIVE TEXTBOOKS:
Required:
ISBN: 978-1-56027-728-6
Reading level of text, Grade: 12th
Verified by: MS Word
Required:
ISBN: 978-0983865810
Reading level of text, Grade: 12th 
Verified by: MS Word
Required:
ISBN: 978-1560279525
Reading level of text, Grade: 12th 
Verified by: MS Word
Other textbooks or materials to be purchased by the student: The student will be required to provide basic tools.

ARTICULATION and CERTIFICATE INFORMATION
Associate Degree:
CSU GE:
IGETC:
CSU TRANSFER:
   Transferable CSU, effective 199050
UC TRANSFER:
   Not Transferable

SUPPLEMENTAL DATA:
Basic Skills: N
Classification: Y
Noncredit Category: Y
Cooperative Education:
Program Status: 1 Program Applicable
Special Class Status: N
CAN:
CAN Sequence:
CSU Crosswalk Course Department: AMT
CSU Crosswalk Course Number: 111
Prior to College Level: Y
Non Credit Enhanced Funding: N
Funding Agency Code: Y
In-Service: N
Occupational Course: B
Maximum Hours:
Minimum Hours:
Course Control Number: CCC000235617
Sports/Physical Education Course: N
Taxonomy of Program: 095010