

**Course Outline**

**COURSE:** AMT 100                      **DIVISION:** 50                      **ALSO LISTED AS:**

**TERM EFFECTIVE:** Spring 2020                      **CURRICULUM APPROVAL DATE:** 11/12/2019

**SHORT TITLE:** GEN AIRCRAFT TECH

**LONG TITLE:** General Aircraft Technology

<u>Units</u>	<u>Number of Weeks</u>	<u>Type</u>	<u>Contact Hours/Week</u>	<u>Total Contact Hours</u>
9	18	Lecture:	7.5	135
		Lab:	5	90
		Other:	0	0
		Total:	12.5	225

**COURSE DESCRIPTION:**

This course is an FAA Part 147 course designed to prepare the student for their FAA Airframe and Powerplant (A and P) certificate. The course will provide the student with a thorough understanding of the use of basic hand tools and measuring devices; basic physics and math; aircraft materials, processes and hardware, procedures for clean and corrosion control; weight and balance techniques; and human factors. Both theory and practical application to aircraft systems are taught. Approval from a Gavilan College counselor must be obtained before registering for this class. **COREQUISITE:** AMT 110, Airframe Maintenance Technology. **ADVISORY:** Mathematics 430.

**PREREQUISITES:**

**COREQUISITES:**  
 AMT 110

**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  
 04A - Laboratory - LEH 0.65

## **STUDENT LEARNING OUTCOMES:**

By the end of this course, a student should:

1. Demonstrates the ability to meet the written test standards outlined in FAA AC 147-3 ? Certification and Operation of Aviation Maintenance Technician Schools.
2. Demonstrates the ability to meet the oral/practical test standards outlined in FAA AC 147-3 ? Certification and Operation of Aviation Maintenance Technician Schools.
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.

## **CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS**

Curriculum Approval Date: 11/12/2019

7.5 Hours

### **BASIC HAND TOOLS.**

**CONTENT:** Presentation of basic hand tool selection, construction features, and usage with emphasis on personal safety

issues when using tools incorrectly.

**STUDENT PERFORMANCE OBJECTIVES (SPO):** The student will be able to select the proper tool for the task and use it correctly. They will be able to discuss the importance of personal safety.

7.5 Hours

### **PRECISION MEASURING TOOLS.**

**CONTENT:** Presentation of precision measuring tools to include micrometer calipers, dial calipers, dial indicators, rules and other precision measuring instruments.

**STUDENT PERFORMANCE OBJECTIVES (SPO):**The student will be able to perform correct precision measurements to within .0005 inches.

22.5

Hours

### **AIRCRAFT HARDWARE/AIRCRAFT FLUID LINES AND FITTINGS.**

**CONTENT:** Introduce various aircraft hardware identification systems, i.e., AN, MS and NAS. Discuss hardware features and applications. Discuss correct installation

procedures and how to positively secure various techniques. Discuss proper use of torque wrenches and torque tables. Present aircraft fluid carrying lines, discuss materials, fabrication procedures, testing procedures, repair procedures, installation and inspection practices. Both rigid metal lines and flexible hoses will be presented.

**STUDENT PERFORMANCE OBJECTIVES (SPO):** The student will be able to select and install aircraft hardware without error. They will be able to discuss the various installation procedures and techniques. The student will be able

to correctly identify various fluid carrying line materials and will be able to fabricate fluid lines without error. They will demonstrate the ability to fabricate rigid metal lines and flexible hose

assemblies without error. The student will demonstrate the ability to inspect and correctly install aircraft fluid carrying lines.

22.5 Hours

### **STRUCTURAL METALS AND HEAT TREATMENT.**

**CONTENT:** Present structural aircraft metals, both ferrous and non-ferrous, i.e., iron, steel, aluminum, corrosion resistant steel and titanium. Discuss metal microstructure variations and present heat treatment procedures, i.e., solution heat treatment, precipitation heat treatment, tempering, annealing and normalizing. Discuss case hardening techniques to include cyaniding, nitriding and pack carburizing. Present metal hardness testing equipment to include Rockwell

and Brinell Hardness Testers and testing procedures.

**STUDENT PERFORMANCE OBJECTIVES (SPO):** The student will demonstrate the ability to solution heat treat and temper alloy steel. They will demonstrate how to case harden low carbon steel. The student will explain and demonstrate how to accurately measure the hardness of steel using a Rockwell Hardness Tester.

22.5 Hours

#### AIRCRAFT WEIGHT AND BALANCE.

**CONTENT:** Present aircraft weight and balance computations including aircraft weighting procedures, calculation of aircraft empty weight and empty weight center of gravity, weight and balance extreme condition checks, and addition or removal of equipment calculation. Present required forms for aircraft flight and maintenance manuals and preparation of weight and balance report.

**STUDENT PERFORMANCE OBJECTIVES (SPO):** The student will be able to accurately weigh an aircraft while observing all safety standards. They will be able to calculate the empty weight and corresponding center

of gravity without error. The student will correctly perform extreme condition checks as necessary and prepare an accurate weight and balance report.

22.5 Hours

#### BASIC PHYSICAL SCIENCE.

**CONTENT:** Present basic physical principles, i.e., atomic structure, Newton's Laws, Bernoulli's Principle, Hooks' Law, Charles' Law, Boyle's Law, General Gas Law, energy, simple machines, fluid mechanics, heat, and sound.

**STUDENT PERFORMANCE OBJECTIVES (SPO):** The student will be able to apply basic physical science principles to aerodynamics, engine theory and other aircraft systems operation.

The student will be able to discuss and calculate force, area, pressure, volume, and distance to solve fluid mechanics problems without error.

22.5 Hours

#### MATHEMATICS FOR AIRCRAFT MAINTENANCE.

**CONTENT:** Addition, subtraction, multiplication and division of positive and negative numbers will be presented. The calculation of area and volume of various geometrical shapes will be presented. The extraction of roots and the conversion of numbers to powers I.E. scientific notation will be presented. Problems involving the calculation of ratio, proportion and percentage will also be presented.

**STUDENT PERFORMANCE OBJECTIVES (SPO):** The student will demonstrate the ability to solve problems involving addition, subtraction, multiplication, division of positive and negative numbers. The student will

also demonstrate the ability to solve problems involving area, volume, ratio, proportion and percentage. The student will also demonstrate the ability to solve problems involving the extraction of roots and conversions of numbers to powers of ten.

2 Hours

Final

Lab Content:

5 Hours

#### BASIC HAND TOOLS.

**LAB PROJECTS:** Complete bucking bar fabrication using only hand tools. Complete drilling, tapping, broken bolt extraction and damaged thread repair.

5 Hours

#### PRECISION MEASURING TOOLS.

**LAB PROJECTS:** Student will make accurate measurements while fabricating bucking bar and drilling and tapping exercise.

15 Hours

AIRCRAFT HARDWARE/AIRCRAFT FLUID LINES AND FITTINGS.

LAB PROJECTS: Practical application on how to properly install and secure aircraft hardware using lockwire, cotter pins, and locking nuts and washers. They will work on testing, repairing, and installing fluid lines.

15 Hours

STRUCTURAL METALS AND HEAT TREATMENT

LAB PROJECTS: Work on practical applications of information presented in lecture on structural metals and heat treatments.

15 Hours

AIRCRAFT WEIGHT AND BALANCE.

LAB PROJECTS: Work on practical application of material covered, including weighting an aircraft, calculating the empty weight center of gravity, and completing an aircraft weight and balance report.

15 Hours

BASIC PHYSICAL SCIENCE.

LAB PROJECTS: Practical application of material presented, including fluid mechanics problems.

15 Hours

MATHEMATICS FOR AIRCRAFT MAINTENANCE.

LAB PROJECTS: The student will solve mathematical problems involving various aircraft maintenance tasks I.E. aircraft weight and balance, fluid mechanics, engine compression ratio, aircraft sheet metal repair.

#### **METHODS OF INSTRUCTION:**

Lecture, audio-visual aids, demonstration, guided practice

#### **METHODS OF EVALUATION:**

Writing assignments

Percent of total grade: 20.00 %

Percent range of total grade: 20 % to 25 % Written Homework Term or Other Papers

Problem-solving assignments

Percent of total grade: 15.00 %

Percent range of total grade: 15 % to 20 % Homework Problems Quizzes Exams

Skill demonstrations

Percent of total grade: 10.00 %

Percent range of total grade: 10 % to 15 Performance Exams

Objective examinations

Percent of total grade: 35.00 %

Percent range of total grade: 35 % to 40 % Multiple Choice Other: Fill-In Exams

#### **OUT OF CLASS ASSIGNMENTS:**

Required Outside Hours: 5

Assignment Description:

Basic Hand Tools

Homework: Complete reading assignments and answer questions

Required Outside Hours: 5

Assignment Description:

Precision Measuring Tools

Homework: Complete reading assignments and answer question sheets.

Required Outside Hours: 10

Assignment Description:

Aircraft Hardware

Homework: Complete reading assignments, answer question sheets, and work on research project.

Required Outside Hours: 10

Assignment Description:

Structural Metals and Heat Treatment

Homework: Complete reading assignments, answer question sheets and work on research project.

Required Outside Hours: 10

Assignment Description:

Aircraft Weight and Balance

Homework: Complete reading assignments and question sheets. Work on aviation related research project.

Required Outside Hours: 10

Assignment Description:

Basic Physical Science

Homework: Complete reading assignments, answer question sheets and work on research project.

Required Outside Hours: 10

Assignment Description:

Mathematics for Aircraft Maintenance

Homework: Complete reading assignments, answer question sheets and work on aviation related research project.

#### **REPRESENTATIVE TEXTBOOKS:**

Dale Crane. Aviation Mechanic Handbook: The Aviation Standard - 6th Edition. Aviation Supplies & Academics, Inc.,2017.

The previous book is not longer published. This is the replacement.

ISBN: ISBN: 978-1619544949

Reading Level of Text, Grade: Reading level of text, Grade: 12th Verified by: Verified by:MS Word

F.A.A.. Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair AC43.13-1B/2B. ASA,2008.

This is a FAA standards document. This is the latest version from the FAA.

ISBN: ISBN: 978-1619540217

Reading Level of Text, Grade: Reading level of text, Grade: 12th Verified by: Verified by:MS Word

F.A.A.. Aviation Maintenance Technician Handbook-General: FAA-H-8083-30A. Aviation Supplies and Academics, Inc.,2018.

The FAA released a new version.

ISBN: ISBN: 978-1619546929

Reading Level of Text, Grade: Reading level of text, Grade: 12th Verified by: Verified by:MS Word

**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: 100

Prior to College Level: Y

Non Credit Enhanced Funding: N

Funding Agency Code: Y

In-Service: N

Occupational Course: C

Maximum Hours:

Minimum Hours:

Course Control Number: CCC000571737

Sports/Physical Education Course: N

Taxonomy of Program: 095000