Last Updated
Spring 1998

SAN BERNARDINO VALLEY COLLEGE
COURSE OUTLINE

I. COURSE IDENTIFICATION

AERO 107: AIRFRAME AND POWERPLANT GENERAL LABORATORY – SERVICING/MATERIALS
6 hours lab = 2 units

This practical shop work companion to AERO 101 provides the hands-on experience mandated by the FAA. Focuses on cleaning and corrosion control; ground operation and servicing; maintenance publications, forms and records; mechanic privileges and limitation, and solutions to common weight and balance problems.

Corequisite(s): AERO 101: Airframe and Power Plant General Curriculum Servicing/Materials, AERO 103: Airframe Maintenance Lecture – Systems and Components and AERO 109: Airframe Maintenance Laboratory – Systems and Components, **OR** AERO 105: Power Plant Maintenance Lecture – Accessory Overhaul and AERO 111: Power Plant Maintenance Laboratory – Accessory Overhaul

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: ONE

III. EXPECTED OUTCOMES FOR STUDENTS:

By the end of this course, the student will be able to:

A. Accomplish those basic areas which the Federal Aviation Administration outlines in Federal Aviation Regulation, Part 147, as necessary to satisfactorily pass the FAA examinations (written, oral, and practical).

B. Research Airworthiness Directives, Federal Aviation Regulations, Type Certificate Data Sheets and Advisory Circulars and determine applicability to specific aircraft.

C. Read and follow written instructions in the performance of task on aircraft including filling out F.A.A. form 337, Major Repair and Alteration Forms, and associated maintenance record entries to F.A.A. standards.

D. Calculate aircraft weight and balance changes and determine if the aircraft is within allowable limits.

E. Research textbooks, maintenance manuals and other written materials and be able to explain in writing and verbally the operation, servicing, troubleshooting and repair of aircraft systems and components.

F. Compare and contrast different types of systems and or repair procedures and explain advantages and disadvantages in relation to acceptability for different

applications.

G. Draw diagrams, systems and circuits for systems and components. Recognize and label components and symbols, show through symbols and colors, flow patterns, and critical changes in temperatures, pressures, velocity and volume.

IV. COURSE CONTENT:

A. AIRCRAFT DRAWINGS

1. USE DRAWINGS, SYMBOLS, AND SCHEMATIC DIAGRAMS
   a. Identify lines and symbols
   b. Interpret dimensions
   c. Interpret electrical system drawings
   d. Use installation diagrams and schematics

2. DRAW SKETCHES OF REPAIRS AND ALTERATIONS
   a. Make sketches

3. USE BLUEPRINT INFORMATION
   a. Read and interpret drawings
   b. Interpret installation diagrams

4. USE GRAPHS AND CHARTS
   a. Use manufacturer's charts and graphs

B. FLUID LINES AND FITTINGS

1. FABRICATE AND INSTALL RIGID AND FLEXIBLE FLUID LINE AND FITTINGS
   a. Bend aluminum and stainless steel tubing
   b. Fabricate flares on tubing
   c. Fabricate and install flexible tubing
   d. Recognize defects in metal tubing
   e. Install a section of tubing

C. MATERIALS AND PROCESSES

1. PERFORM PRECISION MEASUREMENTS
   a. Inspect aircraft components for wear

2. IDENTIFY AND SELECT AIRCRAFT HARDWARE AND MATERIALS
   a. Identify and install aircraft bolts
   b. Identify aluminum alloys
   c. Identify steel alloys
   d. Recognition of economic and engineering criteria in selection of aircraft materials
   e. Identify rivets by physical characteristics
   f. Identify materials used in aircraft firewalls and exhaust shrouds
   g. Determine suitability of materials for aircraft repairs

h. Identify aircraft control cable

3. PERFORM BASIC HEAT-TREATING PROCESSES
   a. Effects of heat treatment
   b. Identify aluminum alloy code designation of heat treatability
   c. Heat treatment processes and strain relieving
   d. Anneal copper and steel parts

4. PERFORM PENETRANT, CHEMICAL ETCHING, AND MAGNETIC PARTICLE INSPECTIONS
   a. Perform dye penetrant inspection
   b. Perform magnetic particle inspection
   c. Perform inspection of welded assemblies
   d. Perform test to distinguish between heat treatable and weldable aluminum alloys

5. INSPECT AND CHECK WELDS
   a. Inspect and evaluate welds

6. INDENTIGY AND SELECT APPROPRIATE NON-DESTRUCTIVE TESTING METHODS
   a. Aircraft uses for non-destructive testing

D. CLEANING AND CORROSION CONTROL

1. IDENTIFY AND SELECT CLEANING MATERIALS
   a. Identify caustic cleaners
   b. Identify cleaning agents for aircraft engine parts

2. PERFORM AIRCRAFT CLEANING AND CORROSION CONTROL
   a. Clean exterior of aircraft
   b. Identify corrosion
   c. Remove corrosion
   d. Apply protective coatings
   e. Remove rust
   f. Clean rubber products

E. GROUND OPERATION AND SERVICING

1. IDENTIFY AND SELECT FUELS
   a. Identify aircraft fuels

2. START, GROUND OPERATE, MOVE, SERVICE, AND SECURE AIRCRAFT
   a. Use fueling equipment
   b. Start and operate aircraft engines
   c. React to fire in induction system
   d. Connect and operate an external hydraulic power source
   e. Direct the movement of aircraft
   f. Prepare an aircraft for outside storage

F. WEIGHT AND BALANCE

1. WEIGH AIRCRAFT
   a. Locate, interpret and apply weight and balance information

2. PERFORM COMPLETE WEIGHT AND BALANCE CHECK AND RECORD DATA
   a. Solve weight and balance problems
   b. Compute forward and aft loaded center of gravity
   c. Compute effect of equipment changes and loading schedules
   d. Compute weight and balance on a helicopter
   e. Examine weight and balance records

V. METHODS OF INSTRUCTION:

1. Lecture
2. Assignment of writing exercise and worksheets
3. Class discussion
4. Use of audiovisual aids
5. Demonstration
6. Field Trips

VI. TYPICAL ASSIGNMENTS:

A. Weigh a particular aircraft and make appropriate log book entries.

B. Make appropriate entries in log books for an oil change and a complete overhaul of an engine. (Your choice of engine)

VII. EVALUATION(S):

A. Methods of Evaluation:

1. Evaluation of the work accomplished as per job sheets.
2. Evaluation of manipulative skills as per industry's standard.
3. Oral examinations.
4. Written examinations.
   Typical questions:
   a. Explain the privileges and limitations of a current airframe and powerplant mechanic.
   b. Describe in detail how to prepare an aircraft to be weighed.

VIII. TYPICAL TEXT(S):

Title: FAR Handbook for Maintenance Technicians
Author: Federal Aviation Administration
Publisher: IAP Inc.
Date of Publication: 1998

Title: A&P Technician General Test Booklet
Author: IAP Inc.
Publisher: IAP Inc,
Date of Publication: 1998

Title: Aricraft Electricity and Electronics 5th ed.
Author: Eismin/Bent/McKinley
Publisher: McGraw-Hill Book Company
Date of Publication: 1995

Title: Aircraft Basic Science 7th Edition
Author: Kroes, Rardon
Publisher: Glencoe
Date of Publication: 1993

IX. OTHER SUPPLIES REQUIRED OF STUDENTS: NONE

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