



**DEPARTMENT OF EDUCATION
PUERTO RICO AVIATION MAINTENANCE INSTITUTE
AVIATION MAINTENANCE TECHNICIAN COURSE
FAA Approved #DN9T092R**

GENERAL COURSE CURRICULUM

VOLUME 2

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Department of Education
Occupational and Technical Education Program**



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PUERTO RICO AVIATION MAINTENANCE INSTITUTE
AVIATION MAINTENANCE TECHNICIAN COURSE
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GENERAL COURSE CURRICULUM MANUAL

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GENERAL COURSE CURRICULUM

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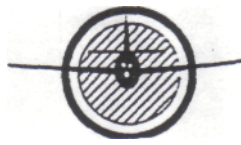
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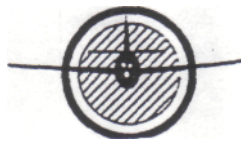
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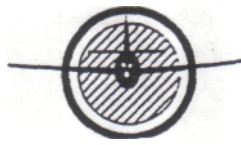
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GENERAL COURSE SCOPE

SUBJECTS	THEORY	SHOP LAB	TOTAL HOURS
1. SAFETY COMMUNICATIONS PROGRAM	18	6	24
2. MECHANIC PRIVILEGES AND LIMITATIONS	6	4	10
3. MAINTENANCE PUBLICATIONS	18	15	33
4. MATEMATICS	15	15	30
5. BASIC PHYSICS	21	18	39
6. AIRCRAFT DRAWING	15	14	29
7. GROUND OPERATION AND SERVICING	10	10	20
8. WEIGHT AND BALANCE	24	20	44
9. MATERIALS AND PROCESSES	30	25	55
10. CLEANING AND CORROSION CONTROL	12	10	22
11. FLUID LINES AND FITTING	12	8	20
12. BASIC ELECTRICITY	48	30	78
13. MAINTENANCE FORMS AND RECORDS	12	8	20
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SCHEDULE OF REQUIRED TESTS

SUBJECTS	No. WRITTEN TEST	NUMBER OF HOURS
1. SAFETY COMMUNICATIONS PROGRAM	1	1
2. MECHANICS PRIVILEGES AND LIMITATIONS	1	2
3. MAINTENANCE PUBLICATIONS	1	2
4. MATHEMATICS	1	2
5. BASIC PHYSICS	1	2
6. AIRCRAFT DRAWING	1	2
7. GROUND OPERATION AND SERVICING	1	2
8. WEIGHT AND BALANCE	1	2
9. MATERIALS AND PROCESSES	2	3
10. CLEANING AND CORROSION CONTROL	1	2
11. FLUID LINES AND FITTING	1	2
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13. MAINTENANCE FORMS AND RECORDS	1	1
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A	BASIC ELECTRICITY
B	AIRCRAFT DRAWING
C	WEIGHT AND BALANCE
D	FLUID LINE AND FITTINGS
E	MATERIALS AND PROCESSES
F	GROUND OPERATIONS AND SERVICING
G	CLEANING AND CORROSION CONTROL
H	MATHEMATICS
I	MAINTENANCE FORMS AND RECORDS
J	BASIC PHYSICS
K	MAINTENANCE PUBLICATIONS
L	MECHANIC PRIVILEGES AND LIMITATIONS
M	SAFETY COMMUNICATION PROGRAM
N	STUDENT WORKBOOK PRACTICAL PROJECT RECORD

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A. BASIC ELECTRICITY

TOTAL HOURS: 78

THEORY: 48

SHOP / LAB: 30

A. COMPOSITION OF MATTER

1. Molecule, Atom, Nucleus, Electron, and Proton
2. Electron Rings, and Electron Movement
3. Static Electricity and Electrostatic Field

B. ELECTROMOTIVE FORCE (E)

1. Water Analogy
2. Potential Difference

C. CURRENT FLOW (I)

1. Ampere and Coulomb

D. RESISTANCE (R)

1. Conductors
2. Semi – conductors
3. Insulators
4. Factors Affecting Resistance

E. BASIC CIRCUIT COMPONENTS AND SYMBOLS

1. Voltage Source
2. Conductors
3. Resistance or Load

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F. SOURCES OF VOLTAGE

1. Chemical – Battery
2. Thermal – Thermocouple
3. Mechanical – Generator
4. Photo Electric – Photo Cell
5. Piezo Electric – Crystal

G. OHMS LAWS

1. Derivation of OHMS Law Formulas

H. POWER

1. Derivation of Power Formula
2. Horsepower Relationship of Electric Power

I. RESISTORS

1. Wire Wound, Composition, Potentiometer
2. Color code
3. Powers of Ten and Prefixes

J. CIRCUIT PROTECTION AND CONTROL DEVICES

1. Fuses and Circuit Breakers
2. Switches, Toggle, Rotary, Micro Switches

K. SERIES DC CIRCUITS

1. Computation of Current, Voltage Drop and Total Resistance
2. Computation of Power Disparate

L. PARALLEL CIRCUITS

1. Kirchhoff Laws
2. Computation of Total Resistance, Branch Current, Voltage Drop, and Power Dissipation

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M. SERIES – PARALLEL CIRCUITS

1. Computation of Voltage, Resistance, Current and Power
2. Voltage Divider

N. MAGNETISM

1. Magnetic Field
2. Electro Magnets
3. Magnetic Field Around a Conductor
4. Solenoids and Relays

O. DC MEASURING INSTRUMENTS

1. D'Arsonval Meter Movement
2. Voltmeter Limiting Resistors – Sensitivity
3. Voltmeter Connection
4. Ammeter Shunt Resistors
5. Ammeter Connection
6. Ohmmeter Theory
7. Use of Multimeter

P. CIRCUIT ANALYSIS AND TROUBLESHOOTING

1. Use of Meter in Troubleshooting Series and Parallel Circuits
2. Trace Circuits Using Aircraft Wiring Diagrams

Q. ALTERNATING CURRENT AND VOLTAGE

1. AC and DC Compared

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R. GENERATOR PRINCIPLES

1. AC Generators; Cycles and Frequencies
2. Values Compared to DC
3. Multi Phase Generators
4. AC Meters

S. INDUCTANCE

1. Types of Inductor
2. Inductive Reactance

T. CAPACITANCE

1. Types of Capacitors
2. Capacitive Reactance
3. Dielectric Values

U. OHMS LAW FOR AC CIRCUITS

1. Impedance
2. Resonance
3. Power in A /C Circuits

V. TRANSFORMER ACTION

1. Turns Ratio
2. Voltage Current
3. Multiphase Transformers
4. Transformer Losses
5. Troubleshooting Transformers
6. Saturation

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W. MAGNETIC AMPLIFIERS

1. Saturable Reactors

X. BATTERY CONSTRUCTION AND SERVICING

1. Lead Acid Construction
2. Lead Acid Servicing
3. Ni- cad Construction
4. Ni- cad Servicing
5. Cell Imbalance and Thermal Run Away

Y. INTRODUCTION TO ELECTRONICS

1. Vacuum Tube Operation. The Diode
2. Amplification. The Triode
3. Special Purpose Tubes
4. Transistors – Diodes, Zener Diode and Three Element Transistors
5. Power Supplies and Filters

Z. DC GENERATOR THEORY

1. Commutation
2. Field Construction
3. Armature Construction
4. Armature Reaction
5. Voltage Regulation

AA. ALTERNATOR THEORY

1. Comparison with DC Generators
2. Rotor and Stator

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BB. DC MOTOR THEORY

1. Series, Shunt, and Compound Wound

CC. AC MOTOR THEORY

1. Universal
2. Induction
3. Synchronous



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PERFORMANCE GOALS

A. BASIC ELECTRICITY	LEVEL
G – 1: CALCULATE AND MEASURE CAPACITANCE AND INDUCTANCE	(2)
A. Using appropriate text material, select answers to questions concerning capacitance, capacitive reactance, inductance, inductive reactance, and the combined effects in an AC circuit.	
G – 2: CALCULATE AND MEASURE ELECTRICAL POWER	(2)
A. Given problems concerning DC electrical power, power when voltage, current or resistance values are given, calculate the power requirements of aircraft electrical circuits.	
G – 3: MEASURE VOLTAGE, CURRENT, RESISTANCE AND CONTINUITY	(3)
A. Using an aircraft or electrical system mockup, information sheets on voltage, resistance, and current, take measurements on the units in the circuit of voltage drop, resistance, and current and prove that circuits have continuity and prove the readings with calculations.	
G – 4: DETERMINE THE RELATIONSHIP OF VOLTAGE, CURRENT AND RESISTANCE IN ELECTRICAL CIRCUITS	(3)
A. Given DC electrical problems of series, parallel, and series-parallel circuits, mathematically show the relationship of voltage, current, and resistance using Ohm's Law	
B. Given AC electrical problems, mathematically show the relationship of voltage, current and resistance using Ohm's Law	

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PERFORMANCE GOALS (continued :)

	LEVEL
G – 5: READ AND INTERPRET AIRCRAFT ELECTRIC, CIRCUIT DIAGRAMS, INCLUDING SOLID STATE DEVICES AND LOGIC FUNCTIONS	(3)
A. Given an aircraft wiring diagram and / or schematic with electrical symbols, locate and identify the symbols	
G – 6: INSPECT AND SERVICE BATTERIES	(3)
A. Given storage batteries of lead acid and/ or Ni-cad type appropriate battery charging equipment, and written information, perform the following: case inspection, check state of charge, check electrolyte level, and replenish as needed prepare and connect batteries for charging and disconnect. All safety procedures will be followed.	



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PRACTICAL PROJECT

A. BASIC ELECTRICITY

1 – A: Calculate and Measure capacitance and Inductance, AC

TEACHING LEVEL – (2)

AVERAGE COMPLETION TIME: 2 hr.

PURPOSE:

To acquaint the student with the required knowledge in calculating and measuring capacitance and inductance in an AC circuit.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENTS AND TOOLS REQUIRED:

1. None

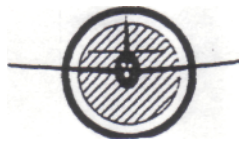
SUPPLIES AND MATERIALS REQUIRED:

1. A list of questions related to capacitance and inductance.

PROCEDURE:

Using a list of questions related to capacitance and inductance. The students will be required to answer correctly the given problems.

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PRACTICAL PROJECT

A. BASIC ELECTRICITY

2 – A: Calculate and Measure Electrical Power, DC

TEACHING LEVEL – (2)

AVERAGE COMPLETION TIME: 3 hrs.

PURPOSE:

To acquaint the student with the required knowledge in calculating electrical power requirement on an aircraft DC electrical circuit.

REFERENCE:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED: None

SUPPLIES AND MATERIALS REQUIRED:

1. A list of problems and questions concerning a DC circuit to calculate the power requirements of an aircraft electrical system based on voltage, current and resistance values changes.

PROCEDURE:

Furnish the student problems to calculate power requirements for an aircraft electrical system based on voltage, current and resistance values.

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PRACTICAL PROJECT

A. BASIC ELECTRICITY

2 – B: Calculate and Measure Electrical Power, AC

TEACHING LEVEL – (2)

AVERAGE COMPLETION TIME: 4 hrs.

PURPOSE:

To acquaint the student with the required knowledge of voltage drop, resistance and current in an electrical circuit.

REFERENCE:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A)
2. A&P Technician General Textbook

EQUIPMENTS AND TOOLS REQUIRED:

1. An aircraft or an electrical system mockup
2. Multimeter

SUPPLIES AND MATERIALS REQUIRED:

1. Empty information sheet to record readings taken.

PROCEDURE:

Supply student with a multimeter. The student will be required to measure voltage drop, resistance and current in an aircraft circuit.

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PRACTICAL PROJECT

A. BASIC ELECTRICITY

3 – A: Measure Voltage, Current, Resistance and Continuity

TEACHING LEVEL – (3)

AVERAGE COMPLETION TIME: 4 hrs.

PURPOSE:

To acquaint the student with the required knowledge and skills in measuring voltage, resistance and current on an electrical circuit and to prove the reading with calculations.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. An aircraft or an electrical system mockup
2. A Multimeter

SUPPLIES AND MATERIAL REQUIRED:

1. An electrical schematic with no assigned values.

PROCEDURE:

1. Provide the student with an electrical schematic with no assigned values and an information sheet so he can calculate reading of voltage, resistance and current. This calculation must be confirmed or proven, with taken measurement on an electrical system mockup.
2. Using a multimeter, the student must prove that an aircraft electrical circuit or units have continuity.

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PRACTICAL PROJECT

A. BASIC ELECTRICITY

4 – A: Determine the Relationship of Voltage, Current and Resistance in DC Electrical Circuits

TEACHING LEVEL – (3)

AVERAGE COMPLETION TIME: 3 hrs.

PURPOSE:

To acquaint students with the required and understanding of Ohm's Law in the form of formula to show the relationship of voltage, current and resistance in a DC electrical circuit.

REFERENCE:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A)
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. A Multimeter

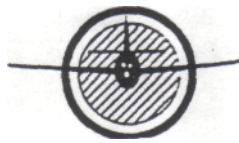
SUPPLIES AND MATERIALS REQUIRED:

1. Blank piece of paper for mathematical computations
2. Pocket calculator

PROCEDURE:

Given DC electrical problems of series, parallel and series-parallel circuits; the student must show mathematically the relationship of voltage, current and resistance using the Ohm's Law Formula. The student will also demonstrate to the instructor the procedure to measure voltage, resistance and current in a direct current electrical circuit.

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PRACTICAL PROJECT

A. BASIC ELECTRICITY

4 – B: Determine the Relationship of Voltage, Current and Resistance in AC Electrical Circuits

TEACHING LEVEL – (3)

AVERAGE COMPLETION TIME: 3 hrs.

PURPOSE:

To acquaint students with the required and understanding of Ohm's Law in the form of formula to show the relationship of voltage, current and resistance in An AC electrical circuit.

REFERENCE:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A)
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

- 1 A Multimeter

SUPPLIES AND MATERIALS REQUIRED:

- 1 Blank piece of paper for mathematical computations
- 2 Pocket calculator

PROCEDURE:

Given AC electrical problems the student must show mathematically the relationship of voltage, current and resistance using the Ohm's Law. The student will also demonstrate his ability to use a multimeter to measure voltage, amperage and resistance in an AC electrical circuit.

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GENERAL COURSE CURRICULUM MANUAL

PRACTICAL PROJECT

A. BASIC ELECTRICITY

- 5-A** Read and interpret Aircraft Electrical Circuit Diagrams, including Solid State Devices and Logic Function

TEACHING LEVEL - 3

AVERAGE COMPLETION TIME: 5 HRS.

PURPOSE:

To acquaint the student with the required knowledge and understanding in reading and interpreting aircraft electric wiring diagrams and/or schematics.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A)
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. An aircraft and/or an electrical mockup.

SUPPLIES AND MATERIALS REQUIRED:

1. An aircraft electrical wiring diagram and/or schematic

PROCEDURE:

Given an aircraft electrical system diagram and/or schematic, the student must identify and locate electrical symbols. He will also locate items on an aircraft and/or an electrical system mockup and will explain to the instructor these items functions in the aircraft or mockup electrical system.

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PRACTICAL PROJECT

A. BASIC ELECTRICITY

6 – A Inspect and Service Batteries

TEACHING LEVEL – (3)

AVERAGE COMPLETION TIME: (6 Hrs.)

PURPOSE:

To acquaint the student with the required knowledge and understanding of the standard practices for servicing Lead–Acid and Ni-Cad batteries. In particular, the differences between both type of batteries, their servicing and safety procedure.

REFERENCE:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A)
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC 43.13-2B, “as amended”)

EQUIPMENT AND TOOLS REQUIRED:

1. Storage Lead Acid battery.
2. Storage Ni – Cad battery
3. Hydrometer
4. Battery Chargers
5. Battery Fillers

SUPPLIES AND MATERIALS REQUIRED:

1. Water and cleaning pan.
2. Electrolyte for Lead -Acid batteries
3. Electrolyte for Ni- Cad batteries.

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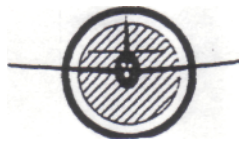
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6 – A Inspect and Service Batteries (continued :)

PROCEDURE:

Given storage Lead–Acid and Ni–Cad batteries, the appropriate battery charging equipment and appropriate written servicing instructions; the student following all safety procedures must:

- a. Inspect battery case.
- b. Check state of charge.
- c. Check electrolyte and service as needed
- d. Remove and install a battery from an aircraft and simulate return to service procedures.
- e. Prepare, connect and disconnect batteries to charger unit.



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B. AIRCRAFT DRAWING

TOTAL HOURS: 29	THEORY: 15	SHOP/LAB: 14
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A: IDENTIFY LINES AND SYMBOLS

1. Purpose of Drawings
2. Kinds of Lines
 - a. Center Line
 - b. Dimension
 - c. Leader
 - d. Break (Long)
 - e. Break (Short)
 - f. Phantom
 - g. Sectioning
 - h. Hidden
 - i. Stitch Line
 - j. Outline or Visible Line
 - k. Datum Line
 - l. Cutting Plane
 - m. Viewing Plane
 - n. Cutting Plane for Complex or Offset Views

B: INTERPRET SYMBOLS

1. Dimension Standards
2. Limits and Tolerances

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C: INTERPRET ELECTRICAL SYSTEM DRAWINGS

1. Kinds of Electrical Drawings
2. Symbols Used in Electrical Circuit Diagrams

D: USE INSTALLATION DIAGRAMS AND SCHEMATICS

1. Diagrams
2. Schematics
3. Analysis of Systems
4. Interpret Information from Diagrams

E: MAKE SKETCHES

1. Pictorial Sketching
2. Orthographic Projections

F: READ AND INTERPRET DRAWINGS

1. Scale of Drawings
2. Title Block Information
3. Changes to Drawings

G: INTERPRET INSTALLATION DIAGRAMS

1. Service Bulletins
2. Modifications
3. Airworthiness Directives
4. Advisory Circulars

H: USE MANUFACTURER CHARTS AND GRAPHS

1. Kinds of Graphs
2. Interpreting Graphs
3. Interpreting Charts



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PERFORMANCE GOALS

B. AIRCRAFT DRAWINGS

LEVEL

- G – 7: USE AIRCRAFT DRAWINGS, SYMBOLS, AND SYSTEMS SCHEMATICS (2)**
- A. Given training handouts of typical aircraft detail and assembly drawings and diagrams, recognize and identify lines and symbols.
 - B. Using typical aircraft drawings; locate and correctly interpret dimensions on the drawing.
- G – 8: DRAW SKETCHES OF REPAIRS AND ALTERATIONS (3)**
- A. Using a sketch pad or drawing paper, make free hand sketches or drawings to illustrate a major repair an alteration, and cutaway schematic of a system or aircraft part (the sketches or drawings will be of such quality that they could be used as part of the maintenance records)
- G – 9: USE BLUEPRINT INFORMATION (3)**
- C. Using textbook copies of blueprints with various scales different title blocks, and changes from the original drawing read and interpret the information, and answer questions pertaining to scale, title block information, and drawing changes.
- G -10: USE GRAPHS AND CHARTS (3)**
- A. Using typical aircraft and/or engines performance charts and graphs, read, interpret and apply data obtained.



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PRACTICAL PROJECT

B. AIRCRAFT DRAWING

7 – A Use Aircraft Drawings, Symbols and Systems Schematics

TEACHING LEVEL (2)

AVERAGE COMPLETION TIME: (3 Hrs)

PURPOSE:

To acquaint the student with the required knowledge and understanding or reading and interpreting aircraft drawings, symbols and system schematics.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

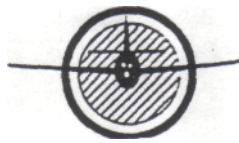
SUPPLIES AND MATERIALS REQUIRED:

1. Detail aircraft and assembly drawing and diagrams.
2. Training handouts

PROCEDURE:

Given training handouts of typical aircraft and detail drawings and diagrams, the student will recognize and identify lines and symbols. The student will prepare a sample drawing of an aircraft part.

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B. AIRCRAFT DRAWINGS

7 – B Use Aircraft Drawings, Symbols and Systems Schematics

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: (3 Hrs)

PURPOSE:

To acquaint the student with the required knowledge and an understanding of reading and interpreting aircraft drawings, symbols and system schematics.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. None

SUPPLIES AND MATERIALS REQUIRED:

1. Detail aircraft and assembly drawings and diagrams
2. Training handouts.

PROCEDURE:

Given typical aircraft drawings, diagrams and/or systems schematics, the student will locate and correctly interpret dimensions of aircraft, parts, assemblies and/or components. The dimensions will be recorded and presented to the instructor.

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PRACTICAL PROJECT

B. AIRCRAFT DRAWINGS

8 – A: Draw sketches of repairs and alterations

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3 Hrs

PURPOSE:

To acquaint the student with the required knowledge and understanding and ability to make free hand sketches and/or drawings of such quality they could be used as part of the maintenance records of a typical aircraft.

REFERENCES:

3. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
4. A&P Technician General Textbook
5. Aircraft Inspection & Repairs (AC 43.13-2B, “as amended”)

EQUIPMENT AND TOOLS REQUIRED:

1. Student basic drawing kit.

SUPPLIES AND MATERIALS REQUIRED:

1. A sketch pad or drawing paper

PROCEDURE:

Using above reference information, the student must make free hand sketches or drawings to illustrate a major repair or alteration of an aircraft part and simulate return to service procedures.

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PRACTICAL PROJECT

B. AIRCRAFT DRAWINGS

9 – A: Use Blueprint Information

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3 Hrs

PURPOSE:

To acquaint the student with the required knowledge and understanding to read and interpret blueprints information.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. Student basic drawing kit

SUPPLIES AND MATERIALS REQUIRED:

1. Textbook copies of blueprints with various scales, different title blocks and changes from original drawings
2. Samples of actual blueprints

PROCEDURE:

Given blueprints samples, the student must read, interpret and answer questions correctly pertaining to scale, title block information and drawing changes. The student will also indicate to the instructor to correct location of a particular item.

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B. AIRCRAFT DRAWINGS

10 – A: Use Graphs and Charts

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3 Hrs

PURPOSE:

To acquaint the student with the required knowledge and understanding to read, interpret and apply information of aircraft and/or engine performance charts and graphs.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. None

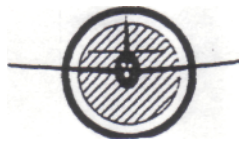
SUPPLIES AND MATERIALS REQUIRED:

1. Typical aircraft performance charts and graphs
2. Typical engine performance charts and graphs.

PROCEDURE:

Given typical aircraft and/or engine performance charts and/or graphs, the student must read, interpret and apply the data obtained correctly.

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C. WEIGHT AND BALANCE

TOTAL HOURS: 44

THEORY: 24

SHOP/LAB: 20

A. INTRODUCTION TO WEIGHT AND BALANCE OF AIRCRAFT

1. Need for Re-weighing
2. Theory of Weight and Balance
3. Mathematical Proof
4. Weight and Balance Data Sources
 - a. Aircraft Specifications
 - b. Aircraft Operating Limitations
 - c. Aircraft Flight Manual
 - d. Aircraft Weight and Balance Report

B. TERMINOLOGY

1. Datum
2. Arm
3. Moment
4. Center of Gravity
5. Empty Weight
6. Useful Load
7. Empty Weight Center of Gravity

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8. Empty Weight Center of Gravity Range
9. Operating Range of Center of Gravity
10. Mean Aerodynamic Chord
11. Aircraft Leveling Means
12. Weighing Points
13. Zero Fuel Weight
14. Minimum Fuel
15. Full Oil
16. Tare Weight

C. AIRCRAFT WEIGHING PROCEDURE

1. Weighing an Aircraft
 - a. Necessary Equipment
 - b. Aircraft Specification or Type certificate Data Sheet
2. Prepare Aircraft for Weighing
3. Measurements
4. Balance Computation
5. Empty Weight
6. Empty Weight C.G.

D. WEIGHT AND BALANCE EXTREME CONDITIONS

1. Forward Weight and Balance Check
2. Rearward Weight and Balance Check
3. Maximum Load Conditions
4. Installation of Ballast
 - a. Controlling C.G. Position with Ballast
 - 1) Permanent Ballast

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2) Temporary Ballast

E. WEIGHT AND BALANCE COMPUTATIONS

1. Loading Graphs and C.G. Envelopes
2. Electronic weighing Equipment
3. Helicopter Weight and Balance

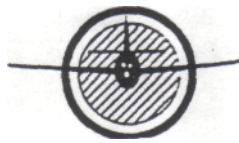


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PERFORMANCE GOALS

C. WEIGHT AND BALANCE	LEVEL
G – 11 WEIGHT AIRCRAFT	(2)
A. Using manufacturer's publication or written references information, and the necessary weighing equipment, locate and interpret information necessary for weighing the aircraft, and weigh the aircraft. All safety precautions and procedures will be observed.	
G – 12 PERFORM COMPLETE WEIGHT AND BALANCE CHECK AND RECORD DATA	(3)
A. Using aircraft specification and weight and balance data; solve five problems involving computation of the empty weight center of gravity.	
B. Given the necessary data to compute center of gravity loading on aircraft, compute the forward and aft center of gravity describe the hazards associated with exceeding the limits, and determine the necessary ballast, baggage reduction, or loading schedule to preclude exceeding the approved limits. Make a sample logbook entry on adding ballast and the new center of gravity.	
C. Using sample loading schedules and equipment specifications for an aircraft, compute the effects of equipment changes of the empty weight center of gravity. Make a sample log book entry on equipment changes and a new weight and balance form. Prepare a loading schedule after solving a problem involving maximum baggage, cargo load or maximum gross loaded center of gravity conditions.	



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PRACTICAL PROJECT

C. WEIGH AND BALANCE

11 – A: Weigh Aircraft

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 6 Hrs

PURPOSE:

To acquaint the student with the correct procedure for weighing an aircraft and to locate and interpret all necessary weight information. To establish safety precautions while weighing an aircraft

REFERENCES:

1. Applicable Aircraft Service Manual
2. Applicable Aircraft FAA Type Certificate Data Sheet.
3. FAA Advisory Circular (AC 43.13-1B, “as amended”)
4. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
5. A&P Technician General Textbook
6. Aircraft Weight and Balance Handbook (FAA-H-8083-1B, “as amended”)

EQUIPMENT AND TOOLS REQUIRED:

1. Complete Aircraft
2. Set appropriate calibrated scales or weighing equipment
3. Spirit level, plumb bob, 24 in. square, chalk line and adequate rule tape.
4. Appropriate aircraft jacks, stands and chocks.

SUPPLIES AND MATERIALS REQUIRED:

1. Appropriate weight and balance weighing form.
2. Clipboard.

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PRACTICAL PROJECT

C. WEIGHT AND BALANCE

11 – A: Weigh Aircraft (continued :)

PROCEDURE:

Using reference (AC 43.13-1B, “as amended”) ch-10, a thorough and applicable aircraft manufacturer “Service Manual” weighing procedure information and applicable aircraft type certificate data sheet, a group of students will demonstrate the procedure of weighing an aircraft.



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PRACTICAL PROJECT

C. WEIGHT AND BALANCE

12 – A: Perform Complete Weight and Balance Check and Record Data

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 7 Hrs

PURPOSE:

To acquaint the student with the required knowledge for computing aircraft empty weight and empty weight center of gravity.

REFERENCES:

1. FAA Advisory Circular (AC 43.13-1B, “as amended”)
2. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
3. A&P Technician General Textbook
4. Aircraft Weight and Balance Handbook (FAA-H-8083-1B, “as amended”)

EQUIPMENT AND TOOLS REQUIRED:

1. Pocket Calculator

SUPPLIES AND MATERIALS REQUIRED:

1. Empty weight center of gravity formulas.
2. Sample of typical aircraft weighing forms.

PROCEDURE:

To furnish the student with five problems involving computation of aircraft empty weight center of gravity, Given all required data , the student will work out and solve each one of the five examples problems. An aircraft will be weighed and return to service procedures will be explained.

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PRACTICAL PROJECT

C. WEIGHT AND BALANCE

12-B Perform complete weight and balance check and record data.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 7 Hrs

PURPOSE:

To acquaint the student with the required knowledge for computing aircraft center of gravity loading on aircraft; compute the forward and aft center of gravity. To understand the hazards associated with exceeding the limits. To determine the necessary ballast, baggage reduction, or loading schedule to preclude exceeding the approved limits. To make the required logbook entries.

REFERENCE:

1. FAA Advisory Circular (AC 43.13-1B, “as amended”)
2. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
3. A&P Technician General Textbook
4. Aircraft Weight and Balance Handbook (FAA-H-8083-1B, “as amended”)

EQUIPMENT AND TOOLS REQUIRED:

1. An aircraft
2. Pocket calculator

SUPPLIES AND MATERIALS REQUIRED:

1. Empty weight center of gravity formulas.
2. Samples of typical weight and balance forms.

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PRACTICAL PROJECT

C. WEIGHT AND BALANCE

12-B Perform complete weigh and balance check and record data. (continued :)

PROCEDURE:

To furnish the student with five problems involving computation of aircraft weight and balance adverse loaded checks and determine the necessary ballast or baggage reduction. The student will write out a list of hazard conditions associated with exceeding the aircraft loading and hazard conditions associated with exceeding the aircraft loading limits. The students will be required to make sample log book entry on loading ballast and the new center of gravity, simulating a return to service situation.



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D. FLUID LINES AND FITTINGS:

TOTAL HOURS: 20

THEORY: 12

SHOP/LAB: 8

A. FABRICATE, REPAIR AND INSTALL RIGID FLUID LINES AND FITTINGS

1. Bend Aluminum Tubing
 - a. Minimum Bend Radius
 - b. Soft Aluminum Tubing Bent by Hand
 - c. Hand Bending Tools
 - d. Power Bending Tools
 - e. Tubing Size Designation
2. Fabricate Flares on Tubing
 - a. Tube Flaring Tools
 - b. Tubing Materials
 - c. Flaring Procedures
 - 1) Single Flare
 - 2) Double Flare
3. Form a Bead on Tubing
 - a. Tools Required
 - b. Beading Procedures
 - c. Problems from Over beading or Under beading
4. Recognize Defects in Metal Tubing
 - a. Defects in Metal Tubing

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- 1) Scratches
- 2) Dents
- 3) Flattened Bends
- 4) Defective Flare
- b. Repairing Metal Tubing
 - 1) Use of a Bullet
 - 2) Repair by Use of Union
 - 3) Tube Section Replacement
 - 4) Minor Scratches
5. Install a Section of Tubing
 - a. Routing of Fluid Lines
 - b. Types of Tubing Connections
 - 1) AN Fittings
 - a) Aluminum
 - b) Steel
 - 2) AC Fittings
 - 3) MS Flareless Fittings
 - c. Installation of Fluid Lines

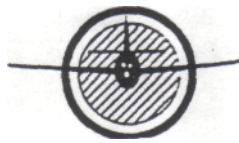
B. FABRICATE AND INSTALL FLEXIBLE FLUID LINES AND FITTINGS

1. Fabricate Flexible Hose
 - a. Tool Selection
 - b. Material Selection
 - c. Size Designation
 - d. Storage of Hose Material
 - e. Installation of Fittings

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2. Install a Flexible Fluid Line
 - a. Use of Flexible Fluid Line
 - b. Routing of Flexible Lines
 - c. Flexible Fluid Line Connections
 - d. Installation of Flexible Fluid Lines
 - 1) Identification Stripe
 - e. Inspection of Flexible Line Assembly



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PERFORMANCE GOALS

D. FLUID LINES FITTINGS

LEVEL

**G – 13 FABRICATE AND INSTALL RIGID AND FLEXIBLE
FLUID LINES AND FITTINGS**

(3)

- A. Given aluminum tubing, flaring equipment, and flaring reference information, form flares on each end of the tubing.
- B. Using text book information, an instruction sheet, a piece of aluminum tubing, and hand bending tools, make three bends in the tubing.
- C. Using an aircraft and/or mockup, install a section of tubing: determine the proper routing and support of the tubing.
- D. Using field replaceable fittings, flexible hose, installation tools, appropriate reference information, and an aircraft or mockup, identify and select the correct hose materials and fittings; fabricate and install a flexible hose assembly.



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PRACTICAL PROJECT

D. FLUIDS LINES AND FITTINGS

13 – A: Fabricate and install Rigid and Flexible Fluid Lines and Fittings

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 4 Hrs

PURPOSE:

To acquaint the student with the required knowledge and practice in forming flares on aluminum tubing.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. Flaring tool set

SUPPLIES AND MATERIALS REQUIRED:

1. Aluminum tubing

PROCEDURE:

1. Given a piece of aluminum tubing, using appropriate flaring equipment and technical information found in above mentioned references; the student must show his ability to flare correctly both ends of an aluminum tubing.
2. Given an appropriate flaring equipment and technical information you will be able to show your ability to flare correctly both ends of a piece of aluminum tubing after installing the appropriate nuts and sleeves.

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PRACTICAL PROJECT

D. FLUID AND LINES FITTINGS

13 – B: Fabricate and Install Rigid and Flexible Fluid Lines and Fittings

TEACHING LEVEL 3

AVERAGE COMPLETION TIME: 4 Hrs.

PURPOSE:

To acquaint the students with the required knowledge and skills to identify, select correct size, materials and fittings to fabricate and install an aviation flexible hose.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC 43.13-1B, “as amended”)

EQUIPMENT AND TOOLS REQUIRED:

1. Flareless fittings installations tool set
2. General hand tools
3. Flexible hose pressure tester
4. An aircraft and/or training mockup

SUPPLIES AND MATERIALS REQUIRED:

1. Aeroquip hoses and fittings
2. Assortment of flareless fittings

PROCEDURE:

Using an aircraft and/or training mockup, appropriate installation tools, flexible hose, fittings and technical information: the student must identify and select materials to fabricate and properly install a flexible hose assembly.

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GENERAL COURSE CURRICULUM MANUAL

E. MATERIALS AND PROCESSES

TOTAL HOURS: 55	THEORY: 30	SHOP/LAB: 25
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A. AIRCRAFT HARDWARE

1. Definitions
2. Identification

B. THREADED FASTENERS

1. Purpose and Use of Threaded Fasteners
2. Types of Threaded Fasteners
3. Classification of Threads

C. AIRCRAFT BOLTS

1. General Purpose Bolts
2. Close Tolerance
3. Internal Wrenching Bolts
4. Identification and Coding
 - a. AN-NAS Numbering System
 - b. Head Markings on Bolts
 - c. Color Coding of Bolts

D. SPECIAL PURPOSE BOLTS

1. Clevis Bolts
2. Eye Bolts
3. Jo-Bolts
4. Lock Bolts

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E. AIRCRAFT NUTS

1. Non-Self Locking Nuts
 - a. Castle Nut
 - b. Castellated Sheer Nut
 - c. Plain Hex Nut
2. Self Locking Nuts
 - a. Bolts Self Locking Nut
 - b. Stainless Steel Self Locking Nuts
 - c. Fiber Insert Type
 - d. Sheet Sprung Nuts
 - e. Internal and External Wrenching Nuts
3. Identifications and Coding

F. AIRCRAFT WASHERS

1. Plain Washers
2. Lock Washers
3. Shake Proof Lock Washers
4. Special Washers

G. INSTALLATION OF NUTS AND BOLTS

1. Bolt and Hole Sizes
2. Installation Practices
3. Torque

H. AIRCRAFT SCREWS

1. Differences Between Bolts and Screws
2. Structural Screws
3. Machine Screws

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4. Self Tapping Screws
5. Drive Screws
6. Identification and Coding

I. TURNLOCK FASTENERS

1. Dzus Fasteners
2. Camlock Fasteners
3. Airlock Fasteners

J. CONTROL CABLES AND TERMINALS

1. Cable Construction
2. Cable Designations
3. Cable Terminal Fitting
4. Turnbuckles

K. PINS

1. Taper Pins
2. Flathead Pins
3. Cotter Pins
4. Roll Pins

L. SAFETY METHODS

1. General Rules
 - a. Safety Wiring
 - b. Cotter Pin Safetying
2. Nuts, Bolts, and Screws
3. Oil caps, drain Cocks, and Valves
4. Electrical Connection
5. Turnbuckles

M. RIVETS

1. Solid Shank Rivets
 - a. Types

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- b. Material and Application
- c. Identification
- 2. Special (Blind) Rivets
 - a. Mechanically Expanded Rivets
 - b. Rivnut
 - c. Explosive Rivets
 - d. Internally Threaded Rivets
 - e. Deutsche Rivets
 - f. Pin (High Shear) Rivets

N. PLASTICS

- 1. Transparent Plastics
 - a. Thermoplastic
 - b. Thermosetting
 - c. Manufactured Forms
 - d. Storage
- 2. Reinforced Plastics
 - a. Uses and Advantages
 - b. Construction Methods

O. RUBBER PRODUCTS

- 1. Natural Rubber
- 2. Synthetic Rubber
 - a. Butyl
 - b. Buna-S
 - c. Neoprene

- 3. Seals and Packing
- 4. Gaskets

P. WOOD PRODUCTS

- 1. Spruce

2. Birch
3. Mahogany

Q. NON-FERROUS AIRCRAFT METALS

1. Aluminum and Aluminum Alloys
 - a. Casting Alloys
 - b. Wrought Alloys
 - c. Aluminum Designations
 - d. Aircraft Applications
2. Titanium and Titanium Alloys
 - a. Properties
 - b. Aircraft Applications
 - c. Identification
 - d. Titanium Designations
3. Magnesium and Magnesium Alloys
 - a. Properties
 - b. Aircraft Applications
 - c. Fire Hazards Associated with Magnesium
 - d. Identification
 - e. Magnesium designation
4. Copper and Copper Alloys
 - a. Properties
 - b. Aircraft Application
5. Monel
 - a. Properties
 - b. Aircraft Application

R. FERROUS AIRCRAFT METALS

1. SAE Code Identification System

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2. Type Characteristics and Uses of Alloyed Steel
3. Code Marking on Alloy Steel
4. Identifying Temper Conditions
5. Aircraft Application

S. EFFECTS OF HEAT TREATMENT

1. Relationship Between Hardness and Tensile Strength
2. Types of Heat-Treating Processes
3. Internal Structure of Metals
4. Results of Incorrect Heat treatment Procedures

T. HEAT TREATMENT OF FERROUS AND NON-FERROUS METALS

1. Heat Treating Equipment
 - a. Furnaces
 - b. Quenching Equipment
2. Heat Treatment of Ferrous Metals
 - a. Behavior of Steel During Heating and Cooling
 - b. Heating
 - c. Soaking
 - d. Cooling
 - e. Hardening
 - f. Tempering
 - g. Annealing
 - h. Normalizing
3. Casehardening
 - a. Carburizing
 - b. Nitriding
4. Heat Treatment of Non-Ferrous Metals
 - a. Solution Heat Treatment
 - 1) Temperature

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- 2) Time at Temperature
- 3) Quenching
- 4) Lag Between soaking and Quenching
- 5) Reheat Treatment
- 6) Straightening After Solution Heat Treating
- b. Precipitation Heat Treating
 - 1) Advantage of Precipitation Heat Treating
 - 2) Precipitation Practices

U. HAND TOOLS AND MEASURING DEVICES

- 1. General Purpose Tools
 - a. Hammer and Mallets
 - b. Screwdriver
 - c. Pliers and Plier Type Cutting Tools
 - d. Punches
 - e. Wrenches
- 2. Metal Cutting Tools
 - a. Hacksaws
 - b. Hand Snips
 - c. Chisels
 - d. Files
 - e. Drills
 - f. Reamers
 - g. Countersinks
- 3. Layouts and Measuring Tools
 - a. Ruler
 - b. Combination Sets
 - c. Scriber
 - d. Dividers and Pencil Compasses

- e. Calipers
- f. Micrometer Calipers
- g. Vernier Calipers

V. USE OF PRECISION MEASURING INSTRUMENT

- 1. Micrometers
 - a. Micrometer Parts
 - b. Reading a Micrometer
 - c. The Vernier Scale
 - d. Using a Micrometer
- 2. Dial Indicators
 - a. Uses of the Dial Indicator
 - b. Setting Up a Dial Indicator
 - c. Taking Readings with a Dial Indicator
- 3. Ball Gauges and Telescoping Gauges
- 4. Go – No – Go Gauges

W. MAGNETIC PARTICLE INSPECTION

- 1. Magnetic Particle Inspection Principles
 - a. Magnetism
 - b. Permanent Magnets
 - c. Electricity and Magnetism
 - 1) Circular Magnetism
 - 2) Longitudinal Magnetism
- 2. Magnetic Particle Inspection Technique
 - a. Preparation of Parts for Testing
 - b. Development of Indications
 - c. Types of Discontinuities Disclosed
 - d. Effect of Flux Directions
 - e. Effect of Flux Density

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- f. Magnetizing Methods
- g. Identifications of Indications
- 3. Demagnetization
 - a. Standard Demagnetizing Practice
 - b. AC Coil Demagnetization
 - c. Direct Current Demagnetization
 - d. Field Indicator

X. DYE PENETRANT INSPECTION

- 4. Penetrant Inspection Principles
 - a. Capillary Action
 - b. Penetration of Surface Discontinuities
 - c. Reversed Capillary Action
 - d. Sequence of Liquid Penetrant Inspection
 - e. Capabilities of Inspection
 - f. Limitations
- 5. Equipment and Materials
 - a. Pre and Post Inspection Equipment
 - b. Penetrant Inspection Equipment (Stationary)
 - c. Penetrant Inspections Equipment (Portable)
 - d. Black Light
 - e. Materials
- 6. Liquid Penetrant Inspection Technique
 - a. Parts preparation and Cleaning Method
 - b. Penetrant Application
 - c. Emulsifier Application
 - d. Developer Application
 - e. Removal Methods
- 7. Interpretation of Penetrant Indications

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- a. Basic Steps of Inspection
 - b. Classification of Discontinuities
 - 1) Surface
 - 2) Subsurface
 - c. Indication
 - d. Defect
 - e. Non Relevant Indications
 - f. False Indications
8. Other Inspection Methods
- a. Ultra Sonic
 - b. Eddy Current
 - c. X-Ray
 - d. Isotopes

Y. INSPECT AND CHECK WELDS

9. Desirable Characteristics of a Completed Weld
- a. Bead Width
 - b. Penetration
 - c. Reinforcement
10. Undesirable Characteristics
- a. “Cold” Welds
 - b. “Hot” Welds
 - c. Gas Pockets
 - d. Porosity
 - e. Slag Inclusions
11. Unacceptable Defects
- a. Insufficient Width

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- b. Lack of Penetration
 - c. Poor Fusion
 - d. Burning and Pitting
 - e. Blowholes
12. Inspection by Magnifying Glass After Welding



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PERFORMANCE GOALS

E. MATERIAL AND PROCESSES	LEVEL
G-14: IDENTIFY AND SELECT APPROPRIATE NONDESTRUCTIVE TESTING METHODS	(1)
A. Given written descriptions of typical aircraft defects or flaws select which method of testing is best suited for detection and evaluation of each described defect or flaw and briefly state how the inspection should be accomplished.	
G-15: PERFORM DYE PENETRANT, EDDY CURRENT, ULTRASONIC AND MAGNETIC PARTICLE INSPECTIONS	(2)
A. Using a dye Penetrant inspection kit, applicable operating instructions, and a sample aircraft part, prepare the part for inspection, apply and remove the Penetrant, apply developer inspect for cracks, and clean after inspection.	
B. Using magnetic particle inspection equipment, applicable operating instructions, and steel aircraft part, perform the magnetic particle inspection, properly demagnetize the part, and properly clean the part after demagnetizing. All safety procedures will be followed.	
C. Using a chemical solution, a piece of aluminum, and written instructions, performs the chemical etching processes. When completed, rinse all materials used (rag, sponges, brushes, etc.) to remove all traces of the chemical. All safety procedures will be followed.	



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G-16: PERFORM BASIC HEAT TREATING PROCESSES (1)

- A. Using written technical information, answer questions concerning heat treatment of aluminum, steel and strain hardening and its effect on tensile strength.
- B. Using written technical information, answer questions concerning the relationship between tensile strength and metal hardness, the effects of heat treatment, and the results of improper heat treatment procedures.

G-17: IDENTIFY AND SELECT AIRCRAFT HARDWARE AND MATERIALS (3)

- A. Given a safety wire training board, a supply of safety wire, and the AC 43.13-1B (as revised) safety different arrangements of bolts and nuts, and safety turnbuckles.
- B. Using a bolted installation problem (as specified by the instructor) on an aircraft component and/or mockup, determine the correct length and type of bolt, washer, and nut to install the proper torque and safety.
- C. Given a random unlabeled display of types of rivets, identify each rivet by head shape, alloy, dimensions, and used rivet identification, information, type letter designating strength characteristics.
- D. Using written information on rivets, answer questions concerning use limitations for certain types of rivets, chilling, age hardening, and the need for heat treatment of some rivets.

G-18: INSPECT AND CHECK WELDS (3)

- A. Using samples of welds and the AC 43.13-1B(as revised) inspect And check the quality of the weld, list all faults and decide Whether it is acceptable or should be rejected.

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PERFORMANCE GOALS (CONTINUED :)

G-19: PERFORM PRECISION MEASUREMENTS

(3)

- A. Given micrometers, calipers, hole gauges, etc., aircraft Components manufacturer's limit information, perform Inspections using appropriate inspection tools to detect wear.



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PRACTICAL PROJECT

E. MATERIAL AND PROCESSES

PRACTICAL PROJECT:

14-A Identify and select appropriate non-destructive testing methods

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To demonstrate your knowledge and understanding related to various non-destructive testing methods testing for detection and evaluation of specific materials flaws.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC 43.13-1B, as revised)

EQUIPMENT AND TOOLS REQUIRED:

None

SUPPLIES AND MATERIALS REQUIRED:

1. A & P Technician General Textbook
2. A & P Technician General Workbook

PROCEDURE:

Using written technical information, answer questions concerning selection of correct non-destructive testing for specific material flaws and briefly state how the inspection should be accomplished.

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PRACTICAL PROJECT

E. MATERIAL AND PROCESSES

15-A: Perform Dye Penetrant, Eddy Current, Ultrasonic and Magnetic Particle Inspections.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 3 Hrs

PURPOSE:

To acquaint the student with the required knowledge and skills to perform “Non-destructive Testing” using the Dye Penetrant inspection method.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC 43.13-1B, as revised)

EQUIPMENT AND TOOLS REQUIRED:

1. Dye Penetrant inspection kit
2. Magnifying glass

SUPPLIES AND MATERIALS REQUIRED:

1. Damaged and cracked aircraft parts.
2. Cleaning pan
3. Cleaning Cloth or rags

PROCEDURE:

Given a damaged component and Dye Penetrant inspection kit; the student or group of students will prepare the part for inspection, apply, remove the Penetrant and apply Developer. Students will then inspect for visible cracks or defects using a magnifying glass as required. This task will be performed following above references and instructions. Finally, the part or component will be cleaned after inspection.

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PRACTICAL PROJECT

E. MATERIALS AND PROCESSES

15-B: Perform Dye Penetrant, Eddy Current, Ultrasonic and Magnetic Particle Inspections.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 3 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and skills to perform magnetic particle inspection (Magna-Flux)

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC 43.13-1B, as revised))

EQUIPMENT AND TOOLS REQUIRED:

1. Magna-Flux Machine

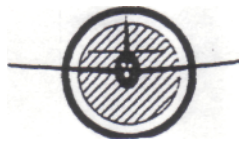
SUPPLIES AND MATERIALS REQUIRED:

1. Damaged or cracked steel parts or components

PROCEDURE:

Given a damaged and/or cracked steel parts and using a Magna-Flux Machine; the student or group of students will prepare the part for inspection and following above references instructions will perform the magnetic particle inspection. After inspection the part will be demagnetized and properly cleaned. Student will be sure to follow all safety procedures during this inspection.

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PRACTICAL PROJECT

E. MATERIALS AND PROCESSES

15-C: Perform Dye Penetrant, Eddy Current, Ultrasonic and Magnetic Particle Inspections.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 3 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and skills to perform chemical etching process on aluminum parts.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC 43.13-1B, as revised)

EQUIPMENT AND TOOLS REQUIRED:

1. Piece of aluminum or aluminum propeller blade
2. Magnifying glass
3. Water hose

SUPPLIES AND MATERIALS REQUIRED:

1. Caustic Soda
2. Nitric Acid
3. Rags, Sponges and Acid Brushes.

PROCEDURE:

Given a piece of aluminum and elements to prepare a caustic chemical solution; the student or group of students will perform the chemical etching process following the above references instructions and all safety procedures. A Nitric Acid Solution will be used for cleaning the aluminum part, which should be rinsed with warm water together with all materials used (rags, sponges, brushes, etc.).

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PRACTICAL PROJECT

E. MATERIAL AND PROCESSES

16-A Perform Basic Heat-Treating Processes

TEACHING LEVEL: (1)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To demonstrate your knowledge and understanding of basic heat treating and hardening processes of aluminum and steel materials.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC 43.13-1B, as revised)

EQUIPMENT AND TOOLS REQUIRED:

None

SUPPLIES AND MATERIALS REQUIRED:

1. A & P Technician General Textbook
2. A & P Technician General Workbook

PROCEDURE:

1. Using written technical information, answer questions concerning heat treatment of aluminum, steel and strain hardening and its effect on tensile strength.
2. Using written technical information, answer questions concerning the relationship between tensile strength and metal hardness, the effect of heat treatment, and the results of improper heat treatment procedures.

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E. MATERIAL AND PROCESSES

17-A: Identify and Select Aircraft Hardware and Materials

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 4 Hrs.

PURPOSE:

1. To acquaint the student with required knowledge and skills to perform safety wiring on bolts, nuts and turnbuckles.
2. To acquaint the student with required knowledge and skills to select and determine the correct aircraft hardware, torque value and safety requirements for specific applications.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC 43.13-1B, as revised)

EQUIPMENT AND TOOLS REQUIRED:

1. Torque and Safety Wire Training Board
2. Hand Tools (Safety Wire Pliers or Flatnose Pliers & Diagonal Cutting Pliers)

SUPPLIES AND MATERIALS REQUIRED:

1. Safety Wire.
2. Cotter pins.

PROCEDURE:

Given a torque and safety wire training board, a supply of safety wire and an assortment of cotter pins; the student will use the information necessary from the above-mentioned reference to properly safety arrangements of bolts, nuts, and turnbuckles and must determine the correct hardware type, length and torque value for the specific application.

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17-B: Identify and Select Aircraft Hardware and Materials

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and skills to select and determine the correct aircraft hardware, torque values and safety requirement for specific applications.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC 43.13-1B, as revised)

EQUIPMENT AND TOOLS REQUIRED:

1. Torque and Safety-wire Training Board.

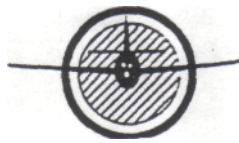
SUPPLIES AND MATERIALS REQUIRED:

1. Safety wire.
2. Cotter pins

PROCEDURE:

1. Given a torque and Safety-wire training board, safety wire and an assortment of cotter pins; the student will use the information necessary from the above mentioned references and must determine the correct hardware type, length, torque value and safety required for the specific application.

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E. MATERIAL AND PROCESSES

17-C: Identify and Select Aircraft Hardware and Materials

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and skills to identify correctly types of rivets based on rivet head shape, type design, alloy, strength characteristics, and required knowledge and reference to be able to answer questions concerning use limitation, special processes or requirements necessary for some rivet's installation.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) "as amended"
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC 43.13-1B, as revised)

EQUIPMENT AND TOOLS REQUIRED:

2. None

SUPPLIES AND MATERIALS REQUIRED:

3. Assortment of aviation quality rivets.
4. A list of question concerning, special rivets installation and characteristic

PROCEDURE:

1. Given an assortment of rivets and using the above-mentioned reference information; the student must identify each rivet by shape, alloy, dimensions, type, design and strength characteristics.
2. Given a list of question concerning use limitations for certain type of rivets (chilling, age hardening etc. and heat treatments requirements of others); the student must answer them correctly based on the technical information studied, the student will simulate a repair and return to service procedure.

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E. MATERIAL AND PROCESS

18-A: Inspect and Check Welds

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the students with the required knowledge and skills to check and inspect welds to determine if they are acceptable or if they should be rejected.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC 43.13-1B, as revised)

EQUIPMENT AND TOOLS REQUIRED:

1. Magnifying glass
2. Bright light

SUPPLIES AND MATERIALS REQUIRED:

1. Welds samples – good and bad ones.

PROCEDURE:

1. Given samples of welds and using the above-mentioned references; the student must visually check and inspect the quality of the weld and list all faults or defects noticed
2. The Student must determine whether the welds are acceptable or if they should be rejected.

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E. MATERIAL AND PROCESSES

19-A: Perform Precision Measurements

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the students with the required knowledge and skills to use, read and interpret precision measurements.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. Micrometers, dial indicator, depth gauge, calipers, hole gauges, etc.

SUPPLIES AND MATERIALS REQUIRED:

1. Parts and/or objects to measure and determine wear.

PROCEDURE:

Given a micrometer, caliper and/or precision gauge with a part or object and using an aircraft component manufacturer limits information and/or technical data; the student must perform measurements inspections with the appropriate precision measurement tool. The measurement will be recorded to detect and determine wear.

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GENERAL COURSE CURRICULUM MANUAL

F. GROUND OPERATION AND SERVICING

TOTAL HOURS:	20	THEORY:	10	SHOP/LAB:	10
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A. CLASSIFICATION OF FUELS

1. Solid
2. Gaseous
3. Liquid

B. CHARACTERISTICS AND PROPERTIES OF AVIATION GASOLINE

1. Volatility
2. Vapor Lock
3. Carburetor Icing
4. Aromatic Fuel
5. Detonation
 - a. Detection by Sound
 - b. Detection by Instrumentation
 - c. Causes
6. Surface Ignition
 - a. Detection by Instrumentation
 - b. Causes
7. Octane and Performance Rating
 - a. Requirements for Minimum Grade Fuel

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- b. Use of Iso-octane Rating for Anti-knock Value
- c. Performance Rating of Fuel
- 8. Purity Requirements of Fuel
 - a. Water in Fuel
 - 1) Causes
 - 2) Hazards
 - 3) Prevention
 - b. Sediments in Fuel
 - 1) Causes
 - 2) Hazards
 - 3) Prevention/Elimination
- 9. Fuel Identification
 - a. Aviation Fuel Color
 - 1) Red (80-87)
 - 2) Blue (100 low lead)
 - 3) Green (100/130)
 - b. Requirements for Coloring Fuel
 - 1) Use of TEL
 - 2) Grade Identification
 - c. Turbine Engine Fuels
 - 1) Jet A
 - 2) Jet B
 - 3) Jet A-1
 - d. Color of Turbine Engine Fuel

C. AIRCRAFT OF FUELING

1. Safety Precautions
2. Emergency Procedures
3. Fire Guard
4. Weather Considerations
5. Fueling from a Mobile Unit
 - a. Grounding the Aircraft
 - b. Grounding the Refueling Truck
 - c. Grounding the Fuel Nozzle
 - d. Proper Position of Mobile Unit
6. Fueling from Barrels and Cans
 - a. Use of Strainers
 - b. Use of Funnels
 - c. Use of Chamois for Filtering Fuel
 - d. Transferring Fuels
7. Pressure Fueling
 - a. Advantages
 - b. Usage in Medium and Large Aircraft

D. AIRCRAFT FIRES AND FIRE EXTINGUISHING AGENTS

1. Types of Fires
 - a. Class A
 - b. Class B
 - c. Class C
 - d. Class D

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2. Fire Extinguishing Agents

a. Water and Water Base Agents

1) Loaded Stream

2) Soda Acid

3) Foam

b. Dry Chemical

1) Sodium Bicarbonate

2) Ammonium Phosphate

3) Potassium Bicarbonate

4) Multipurpose Dry Chemical

c. Gas

1) Carbon Dioxide

2) Halogenated Hydrocarbons

a) Carbon Tetrachloride (Halon 104)

b) Methyl Bromide (Halon 1001)

c) Chrobromethane (Halon 1011)

d) Dibromodifluoromethane (Halon 1211)

e) Bromochlorodifluoromethane (Halon 1211)

f) Bromotrifluoromethane (Halon 1301)

g) Effects of Agents on Aircraft and Engines Surfaces

E. AIRCRAFT FIRE EXTINGUISHER

1. Fixed Extinguishing Systems

2. Portable Fire Extinguisher

a. Self-generating

b. Self-expelling

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- c. Gas Cartridge or Cylinder
 - d. Stored Pressure
 - e. Mechanically Pumped
 - f. Hand Propelled
3. Discontinued Fire-Extinguishing Agents

F. START AND OPERATE AIRCRAFT ENGINES

- 1. Reciprocating Engines
 - a. Selection and Use of External Power Units
 - b. Pre-starting procedures
 - c. Safety Precautions
 - d. Starting Procedures
 - e. Operating Procedures
 - f. Shutdown Procedures
 - g. Emergency Shutdown Procedures
 - h. Extinguishing Induction Fires During Starting
- 2. Hand Cranking
 - a. Safety Precautions
 - b. Body Position
 - c. Hand Position
- 3. Ground Operation Instrumentation Check
 - a. Oil Pressure
 - b. Cylinder Head Temperature
 - c. Propeller Pitch
 - d. Magneto Check
- 4. Turboprop Engines
 - a. Starting

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- b. Shutdown
- c. Emergency Shutdown
- 5. Turbojet Engines
 - a. Pre-start Inspection
 - b. Starting a Jet Engine
 - c. Engine Shutdown
 - d. Emergency Shutdown
 - e. Unsatisfactory
 - 1) Hot Start
 - 2) False or Hung Start
 - 3) Engine Will Not Start
 - f. Engine Checks After Shutdown

G. GROUND SUPPORT EQUIPMENT

- 1. Electrical Power
- 2. Hydraulic Power
- 3. Air Conditioning and Heating Units
- 4. Ground Support Air Start Units
- 5. Pre-oiling Equipment
- 6. Nitrogen Equipment
- 7. Aircraft Jacks

H. GROUND MOVEMENT OF AIRCRAFT

- 1. Towing Aircraft
 - a. Pre-towing Check
- 2. Taxing Aircraft
 - a. Use of the Radio

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- b. Control Tower Standard Light Signals
 - 1) Flashing Green
 - 2) Steady Red
 - 3) Flashing Red
 - 4) Flashing White
 - 5) Alternating Red and Green
- c. Standard FAA Marshalling Signals
 - 1) Aircraft Movement Signals
 - 2) Helicopter Movements Signals
 - 3) Signals for Night Movement

I. PREPARE AN AIRCRAFT FOR OUTSIDE STORAGE

- 1. Aircraft Tie Downs
 - a. Tie Down Anchors
 - b. Tie Down Ropes
 - c. Tie Down Cable
 - d. Tie Down Chains
- 2. Securing Heavy Aircraft
- 3. Securing Light Aircraft
- 4. Tie Down for Storm Conditions
 - a. Protection Against Windstorm Damage
 - b. Securing Multi-engine Aircraft
 - c. Securing Helicopters
 - d. Securing Seaplanes and Aircraft on Skids



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PERFORMANCE GOALS

F.	GROUND OPERATION AND SERVICING	LEVEL
G-20:	START, GROUND OPERATE, MOVE, SERVICE AND SECURE AIRCRAFT AND IDENTIFY TYPICAL GROUND OPERATING HAZARDS	(2)
	A. Using starting and operating instructions start an engine and observe operating limits.	
	B. Using standard hand signals, and text book information, demonstrate standard hand signals.	
	C. Using an aircraft, have a student or students move and secure the aircraft for outside storage.	
G-21:	IDENTIFY AND SELECT FUELS	(2)
	A. Take a sample of fuel and check for water and other contamination.	



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PRACTICAL PROJECT

F. GROUND OPERATION AND SERVICING

20 – A: Start, Ground Operate, Move, Service and Secure Aircraft, Identify Typical Ground Operation Hazards.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 6 Hrs.

PURPOSE:

1. To acquaint the student with the required knowledge and skills necessary to take fuel samples and check for fuel contamination.
2. To acquaint the student with the required knowledge and skills necessary to safely start and operate an aircraft engine.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Operational Manual

EQUIPMENT AND TOOLS REQUIRED:

1. An Airplane or operational engine mock-up with fuel.
2. Fuel Sample Cups

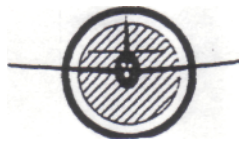
SUPPLIES AND MATERIALS REQUIRED:

1. Starting and operating check list of instructions
2. Fuel and/or contaminated fuel samples.

PROCEDURE:

1. Prior to performing this practical project, the student shall complete practical Project 21-A.
2. Following the manufacturer recommended starting and operating instructions, (check list); the student or group of students will start and will operate the aircraft engine within the operating limits. All Safety precautions will be followed and identified by the student.

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PRACTICAL PROJECT

F. GROUND OPERATION AND SERVICE

20-B Start, Ground Operate, Move, Service and Secure Aircraft and Identify Typical Ground Operation Hazards

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the student with required knowledge to demonstrate hand signals.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. Hand Wands

SUPPLIES AND MATERIALS REQUIRED:

None

PROCEDURE:

Using the standard hand signal information in the textbook and handbook the student will demonstrate his ability to perform correct standard hand signals for the most common ground operations.

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PRACTICAL PROJECT

F. GROUND OPERATION AND SERVICING

20-C: Start, Ground Operate, Move, Service and Secure Aircraft and Identify Typical Ground Operation Hazards.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 1 Hr.

PURPOSE:

To acquaint the student with the required knowledge and skills to secure an aircraft for outside storage.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. An Aircraft

SUPPLIES AND MATERIALS REQUIRED:

1. Tie -down rope
2. A/C Chocks

PROCEDURE:

Given an aircraft, tie-down rope and aircraft chocks and following the above-mentioned references information; the student or group of students will explain and/or demonstrate how to prepare an aircraft for outside storage under normal weather conditions.

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PRACTICAL PROJECT

F. GROUND OPERATION AND SERVICING

21-A: Identify and Select Fuels

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 1 Hr.

PURPOSE:

To acquaint the student with the required knowledge and skills to identify and select fuels from among the common types of aircraft fuels in current use

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) "as amended"
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. An Aircraft, Operable Engine or Fuel System Mock-up

SUPPLIES AND MATERIALS REQUIRED:

1. Fuel Sample Jar

PROCEDURE:

1. Given fuel sample cup and an aircraft and/or engine mock-up with fuel, after taking a fuel sample, the student or group of students will determine if water or other contaminants exist in the fuel tanks.

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G. CLEANING AND CORROSION CONTROL

TOTAL HOURS: 22 THEORY: 12 SHOP/LAB: 10

A. CLASSIFICATION OF CORROSION

1. Chemical
2. Electrochemical

B. FORMS OF CORROSION

1. Surface
2. Dissimilar Metal
3. Intergranular corrosion
4. Stress
5. Fretting
6. Pitting
7. Concentration Cell
8. Exfoliation

C. FACTORS AFFECTING CORROSION

1. Climate
2. Size and Type of Metal
3. Foreign Material
4. Corrosive Material
5. Corrosive Agents
 - a. Acids and Alkalis
 - b. Salts
 - c. Mercury
 - d. Water

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- e. Air
- f. Organic Growths

D. CORROSION PRONE AREAS

1. Exhaust Trail Areas
2. Battery Compartment
3. Bilge Area
4. Wheel Well and Landing Gear
5. Water Entrapment Areas
6. Engine frontal Areas and Cooling Air Vents
7. Wing Flap and Spoiler Recess Areas
8. External Skin Areas
9. Miscellaneous Trouble Areas

E. CORROSION CONTROL AND SURFACE TREATMENT

1. Surface Cleaning and Paint Removal
2. Corrosion of various Metals
 - a. Mechanical Removal of Iron Rust
 - b. Chemical Surface treatment of Steel
 - c. Removal of Corrosion from Highly Stressed Steel Parts
3. Corrosion of Aluminum and Aluminum Alloys
4. Magnesium Alloys
5. Corrosion of Titanium and Titanium Alloys
6. Dissimilar Metal Contacts

F. PROCESSES AND MATERIALS USED IN CORROSION CONTROL

1. Metal Finishing
2. Surface Preparation
3. Electroplating
4. Metal Spraying

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5. Chemical Treatments
 - a. Parco Lubrizing
 - b. Anodizing
 - c. Alodining
 - d. Chemical Surface Treatment and Inhibitions
 - e. Chromic Acid Inhibitor
 - f. Sodium Dichromate Solution
 - g. Chemical Surface Treatments
 - h. Protective Paint Finishes

G. AIRCRAFT CLEANING

1. Exterior Cleaning
 - a. Wet Wash
 - b. Dry Wash
 - c. Polishing
2. Interior Cleaning
 - a. Passenger Area
 - b. Flight Station
 - c. Lavatories/Gallery
3. Cleaning Agents
 - a. Non-flammable Cleaning Agents
 - b. Flammable Agents
4. Power Plant Cleaning
 - a. Fire Prevention Precautions
 - b. Cleaning Rubber Products
 - c. Deterioration by Chemical Action
 - d. Protection From Harmful Chemicals

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- e. Proper Method of Cleaning of Rubber Products
- f. Storage of Rubber Products

H. CLEANING AGENTS

- 1. Solvent Cleaners
 - a. Dry Cleaning Solvents
 - b. Aliphatic and Aromatic Naphtha
 - c. Methyl-Ethyl Ketone (MEK)
 - d. Kerosene
 - e. Cleaning Compound for Oxygen System
- 2. Emulsion Cleaners
 - a. Water Emulsion Cleaners
 - b. Solvent Emulsion Cleaners
- 3. Soaps and Detergent Cleaners
 - a. Cleaning Compound, Aircraft Surfaces
 - b. Nonionic detergent Cleaners
- 4. Mechanical Cleaning Materials
 - a. Mild Abrasive Materials
 - b. Abrasive Papers
- 5. Chemical Cleaners
 - a. Phosphoric Citric Acid
 - b. Baking Soda

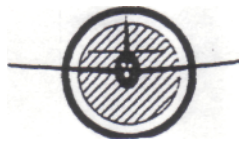


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PERFORMANCE GOALS

G. CLEANING AND CORROSION CONTROL	LEVEL
G-22: IDENTIFY AND SELECT CLEANING MATERIALS	(3)
A. Given samples of cleaning materials (steel, wool, scotch brite, steel wire brush, sandpaper, etc.) and cleaners (caustic and non-caustic) and observe the effects of varying soak times, use the cleaning materials to demonstrate the effects of the different cleaners.	
G-23: INSPECT, IDENTIFY, REMOVE AND TREAT AIRCRAFT CORROSION AND PERFORM AIRCRAFT CLEANING	(3)
A. Using an aircraft, different cleaners, and cleaning equipment, select and employ the correct materials and procedures for exterior cleaning an aircraft.	
B. Given steel and aluminum and/or an aircraft, corrosion inhibiting materials, and suitable equipment for removing corrosion, remove corrosion and apply corrosion inhibiting finish.	



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PRACTICAL PROJECT

F. CLEANING AND CORROSION CONTROL

22-A: Identify and Select Cleaning Materials

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 1 Hr.

PURPOSE:

To acquaint the student with the required knowledge and skills to identify and select cleaning materials and/or solvents.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. Water hose
2. Bucket

SUPPLIES AND MATERIALS REQUIRED:

1. Steel wool, scotch brite pads, sandpapers, etc.
2. Aircraft cleaners (caustic and non-caustic).
3. Piece of aluminum alloy.

PROCEDURE:

Given aluminum alloy samples and aircraft cleaners; the student will observe and demonstrate the effect of varying soak time. The student will use the cleaning materials to demonstrate the effects of different cleaners on an aircraft surface.

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PRACTICAL PROJECT

G. CLEANING AND CORROSION CONTROL

23-A Inspect, Identify, Remove and Treat Aircraft Corrosion and Perform Aircraft Cleaning

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 4 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and skills to identify and select aircraft cleaners and cleaning equipment.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC-43.13-1B, “as amended”)

EQUIPMENT AND TOOLS REQUIRED:

1. An aircraft.
2. Water hose.
3. Bucket and an aircraft washing brush kit.
4. Vacuum cleaner.

SUPPLIES AND MATERIALS REQUIRED:

1. Different aircraft cleaners and/or solvents.
2. Acrylic and plastic cleaners.

PROCEDURE:

Given an aircraft; different cleaners, cleaning equipment and acrylic and plastic cleaners; the student will select and employ the correct materials and procedures to clean the exterior and/or interior of an aircraft.

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PRACTICAL PROJECT

G. CLEANING AND CORROSION CONTROL

23-B Inspect, identify, remove and treat aircraft corrosion and perform aircraft cleaning

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 5 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and skills to remove and treat corrosion in steel and aluminum materials.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Inspection and Repair (AC-43.13-1B, “as amended”)

EQUIPMENT AND TOOLS REQUIRED:

1. An aircraft.
2. Corroded aircraft parts or components.
3. Pneumatic grinder or drill motor.

SUPPLIES AND MATERIALS REQUIRED:

1. Wire and Fiber brushes.
2. Sandpaper.
3. Alodine, Zinc Chromate Primer, Par-al-ketone or Equivalent (LPS 3).

PROCEDURE:

Given steel and aluminum material and or an aircraft; cleaning equipment, materials, corrosion inhibiting materials, etc.; the student will remove and clean corrosion. After cleaning and preparing the affected surface or area the student will apply corrosion inhibiting finish.

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H. MATHEMATICS

TOTAL HOURS: 30	THEORY: 15	SHOP/LAB: 15
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A. WHOLE NUMBERS

1. Addition
2. Subtraction
3. Multiplication
4. Division

B. POSITIVE NEGATIVE NUMBERS

1. Definition
2. Uses

C. COMMON FRACTION

1. Addition, Subtraction, Multiplication, Division, and cancellation of Fractions
2. Transforming Fractions
 - a. Mixed Numbers to Improper Fractions
 - b. Changing Equivalent Fractions
 - c. Reducing Improper Fractions
 - d. Reducing Proper Fractions
3. Determine of Least Common Denominator (LCD)
 - a. Procedure

D. DECIMALS

1. Reading of Decimals

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2. Rounding Decimals
3. Addition, Subtraction, Multiplication, and Division of Decimals

E. FRACTION/DECIMAL CONVERSION

1. Changing Fractions to Decimals
2. Changing Decimals to Fractions
3. Changing Decimals to Ruler Fractions
4. Changing Inches to Feet in Decimal or Fractional Form

F. PERCENTAGE

1. Decimals to a Percent
 - a. Procedure
 - b. Symbol
2. Fraction to a Percent
 - a. Procedure
3. Percent to a Decimal or Fraction
4. Finding Percentage through the Use of Sample Problems

G. TRANSFORMING FORMULAS

1. Computing Area
 - a. Rectangle
 - b. Square
 - c. Triangle
 - d. Wing Area
 - e. Circle and Cylinder
2. Computing Volume of Solids
 - a. Rectangle Solids
 - b. Cylinder

H. RATIOS AND PROPORTIONS

1. Aspect Ratio
 - a. Definition
 - b. Formula

I. POWERS AND ROOTS

1. Powers
 - a. Definition
 - b. Uses
2. Powers of Ten
 - a. Decimal Point Relocation
 - b. Reduction of Base Number
3. Square Root Determination
 - a. Procedure
 - b. Symbol

J. COMPUTING LINEAR AND AREA MEASUREMENTS

1. Linear Measurements
 - a. Equivalents
 - b. Perimeter Computation
 - c. Circumference Computation
 - 1) Radius
 - 2) Diameter
 - 3) Formula
2. Area Measurements
 - a. Square Units
 - b. Converting Common Area Units

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c. Solving Area Problems

- 1) Circles
- 2) Rectangles
- 3) Triangles
- 4) Trapezoids
- 5) Wing Areas

K. VOLUME OF OBJECTS

1. Volume Measurements Units
2. Volume of Geometric Objects

L. GRAPHS AND CHARTS

1. Nomogram

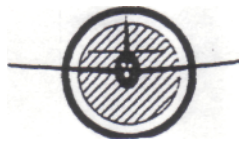


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PERFORMANCE GOALS

H. MATHEMATICS	<u>LEVEL</u>
G-24: EXTRACT ROOTS AND RAISE NUMBERS TO A GIVEN POWER	(3)
A. Using appropriate mathematics and formula information sheet, mathematics problems will be solved.	
G-25: DETERMINE AREAS AND VOLUMES OF VARIOUS GEOMETRICAL SHAPES	(3)
A. Using formulas and information sheets containing drawings of dimensional geometrical shapes, areas and/or volumes will be determined.	
G-26: SOLVE RATIO, PROPORTION, AND PERCENTAGE PROBLEMS	(3)
A. Using a sketch or drawing of a cylinder and piston assembly with stated volumes, with the piston at top dead center and bottom dead center, determine the compression ratio.	
B. Using an information sheet displaying dimensional diagrams or drawings of wing aspect ratio, fineness ratio of streamlined shapes, ratios and percentages will be determined.	
G-27: PERFORM ALGEBRAIC OPERATIONS INVOLVING ADDITION, SUBTRACTION, MULTIPLICATION, AND DIVISION OF POSITIVE AND NEGATIVE NUMBERS.	(3)
A. Using information sheets of algebraic operations problems will be solved, using addition, subtraction, multiplication, and division of positive and negative numbers.	



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PRACTICAL PROJECT

H. MATHEMATICS

24-A: Extract Roots and Raise Numbers to a Given Power

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 1 Hr.

PURPOSE:

To confirm student knowledge and disposition in using formula information sheet and solving mathematical problems.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

SUPPLIES AND MATERIALS REQUIRED:

1. Pocket calculator
2. #2 pencil and paper

PROCEDURE:

Using the appropriate mathematics and formula information sheet; the student will solve correctly mathematics problems included in the project guide.

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PRACTICAL PROJECT

H. MATHEMATICS

25-A: Determine Areas and Volumes of various Geometrical Shapes

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6 Hrs.

PURPOSE:

To confirm student knowledge and disposition in using formulas, information sheets, drawings with dimensional geometrical shapes and determining areas and volumes problems.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

SUPPLIES AND MATERIALS REQUIRED:

1. Pocket calculator
2. #2 pencil and paper

PROCEDURE:

Using formulas and information sheet containing drawings of dimensional geometrical shapes: the student will determine areas and/or volumes.

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PRACTICAL PROJECT

H. MATHEMATICS

26-A: Solve Ratio, Proportion and Percentage Problems

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 6 Hrs.

PURPOSE:

To acquaint the student with the knowledge and understanding to determine ratios and percentage.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

SUPPLIES AND MATERIALS REQUIRED:

1. Pocket calculator
2. #2 pencil and paper

PROCEDURE:

Given a dimensional drawing or diagram of a wing; the student will determine aspect ratio, fineness ratio and percentage.

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PRACTICAL PROJECT

G. MATHEMATICS

27-A: Perform algebraic operations involving addition, subtraction, multiplication and division of positive and negative numbers.

TEACHING LEVEL 3

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and understanding of algebraic applications or operations involving positive and negative numbers.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

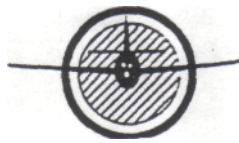
SUPPLIES AND MATERIALS REQUIRED:

1. Pocket calculator
2. #2 pencil and paper

PROCEDURE:

Given addition, subtraction, multiplication and division problems of positive and negative numbers; the student will solve correctly these problems and establish algebraic operations or applications using the same.

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I. MAINTENANCE FORMS AND RECORDS

TOTAL HOURS: 20	THEORY: 12	SHOP/LAB: 8
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A. INTERPRET 14 CFR Part 43

1. Recording of Major Repairs and Major Alterations
2. Use of Inspection forms and Checklist

B. INTERPRET 14 CFR Part 91

1. Maintenance, Preventive Maintenance, and Alterations
 - a. Applicability
 - b. Maintenance Required
 - c. Inspections
 - d. Maintenance Records

C. WRITE A DESCRIPTION OF MAJOR /MINORS REPAIRS AND ROUTINE MAINTENANCE

1. Definitions of “Repairs” as related to Aircraft Maintenance
2. Classification of Repair
3. Entry Requirements
4. Preparation and disposition of FAA Form 337

D. MAKE MAINTENANCE RECORD ENTRIES

1. Requirements for a Permanent Maintenance Record
2. Definition of “Time in Service” with Respect to Maintenance Records
3. Requirements for Returning an Aircraft to Service After 100 Hour Inspection.

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4. Record Requirements to Indicate Compliance with Airworthiness Directives

**E. EVALUATE AIRCRAFT RECORDS FOR COMPLIANCE WITH FEDERAL
AVIATION REGULATIONS**

1. Minimum Required Records
2. Responsibility for Maintaining Required Records
3. Procedure to Follow if Aircraft Records are Lost

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PERFORMANCE GOALS

- | I. | MAINTENANCE FORMS AND RECORDS | LEVEL |
|--------------|--|--------------|
| G-28: | WRITE DESCRIPTIONS OF WORK PERFORMED, INCLUDING DISCREPANCIES AND CORRECTIVE ACTIONS USING TYPICAL AIRCRAFT MAINTENANCE RECORDS | (3) |
| | A. Using an aircraft or aircraft system mockup, conduct an Inspection and prepare a discrepancy list and the corrective action on work performed. | |
| G-29: | COMPLETE REQUIRED MAINTENANCE FORMS, RECORDS, AND INSPECTION REPORTS | (3) |
| | A. Using the A&P Technician General Textbook, fill out a sample malfunction or defect report on a part as specified by the instructor. | |
| | B. Using 14 CFR Part 147 Handbook, make an entry describing a specific major repair, a minor repair (as specified by the instructor), and a 100 Hour inspection in a sample aircraft maintenance record. | |
| | C. Using A&P Technician General Textbook, complete a sample FAA Form 337 and make a return to service entry in a sample aircraft log book for a specific major repair. (as specified by the instructor) | |



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PRACTICAL PROJECT

G. MAINTENANCE FORM AND RECORDS

28-A: Write Description of Work Performed Including Aircraft Discrepancies and Corrective Actions Using Typical Aircraft Maintenance Records.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME; 2 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and understanding of aircraft inspection forms and discrepancy list use during aircraft inspection.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft inspection and repair (AC 43.13-1B, “as amended”)

EQUIPMENT AND TOOLS REQUIRED:

None

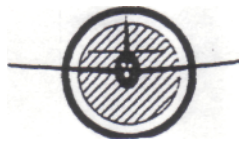
SUPPLIES AND MATERIALS REQUIRED:

1. Samples of Aircraft inspection forms.
2. Samples of Aircraft discrepancy list forms.

PROCEDURE:

Given an aircraft and/or aircraft mockup, inspection forms, discrepancy list forms samples, the student will conduct an inspection of the aircraft or system. The appropriate inspection form and discrepancy list must be used. Description of the work performed will be recorded and return to service Log entry will be presented to the instructor.

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PRACTICAL PROJECT

G. MAINTENANCE FORM AND RECORDS

29-A: Complete Required Maintenance Forms, Records, and Inspection Reports

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the student with the required knowledge to fill an FAA Form 8010-4 Malfunction or Defect Report.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

SUPPLIES AND MATERIALS REQUIRED:

1. Samples of form 8010-4, Malfunction or Defect Report.

PROCEDURE:

Given sample form of malfunction or defect report and using the reference mentioned above; the student will fill out correctly this form and present it to the instructor.

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PRACTICAL PROJECT

G. MAINTENANCE FORM AND RECORDS

29-B: Complete Required Maintenance Forms, Records, and Inspection Report

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the student with the required knowledge to make log book entries for work and/or inspection performed on an aircraft.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

SUPPLIES AND MATERIALS REQUIRED:

1. Samples of maintenance log book pages.

PROCEDURE:

Given maintenance log book pages samples; the student will make typical log book entries after performing specific major & minor repair and a 100 hrs. Inspection on an imaginary aircraft, simulating a return to service situation.

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PRACTICAL PROJECT

G. MAINTENANCE FORM AND RECORDS

29-C: Complete Required Maintenance Forms, Records, and Inspection Report

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the student with the required knowledge to fill out correctly a FAA Form 337 (Major Repair or Major Alteration Form) and the required log book entry for the work performed.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

SUPPLIES AND MATERIALS REQUIRED:

1. Samples of FAA Form 337 (Major Repair or Major Alteration Form)
2. Samples of maintenance log book pages.

PROCEDURE:

Given a FAA Form 337 (Major Repair or Major Alteration Form) and maintenance log book pages samples; the student will fill out correctly a FAA Form 337 and make typical log book entries after performing specific major & minor repair and a 100 hrs. inspection on an imaginary aircraft, simulating a return to service situation.

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J. BASIC PHYSICS

TOTAL HOURS: 39	THEORY: 21	SHOP/LAB: 18
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A. RELATIONSHIP BETWEEN PRESSURE, AREA AND FORCE IN LIQUIDS

1. Computation of Pressure, Force and Area
2. Non-compressibility of Liquids

B. RELATIONSHIP BETWEEN PRESSURE, TEMPERATURE, AND VOLUME OF AN AIR MASS

1. The Law of Gases
2. The Atmosphere
3. Application of General Gas Law to Pressure Volume and Temperature Changes
4. Applications to Aircraft Engines
5. Applications to Cabin Air Conditioning

C. RELATIONSHIP BETWEEN TEMPERATURE AND HEAT

1. Define Heat and Temperature
2. Methods of Heat Transference
3. Relationship of work to B.T.U. and Calorie

D. FACTORS AFFECTING AIR PRESSURE ON AN AIRFOIL

1. Airflow Pattern Over an Airfoil
2. Effect of Air Density
3. Bernoulli's Principle
4. Relationship of Air Density to Temperature and Humidity

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5. Effect of Temperature and Humidity Changes on Aircraft Performance

E. PHYSICAL FACTORS AFFECTING ENGINE POWER OUTPUT

1. Define Work
2. Define Power
3. Density of the Air
4. Effects of Air density on Engine Power

F. THE INCLINED PLANE, THE LEVER, THE PULLEY, AND THE WHEEL

1. Simple Machines
2. Mechanical Advantage of Levers, Pulleys, Wheels, and Inclined Planes

G. THE ORIGIN OF SOUND

1. Creation of Sound
2. Sound Propagation
3. Protection Against Excess of Sound
4. Sound Speeds

H. CENTRIFUGAL/CENTRIPETAL FORCE

1. Newton's Laws of Motion
 - a. Newton's First Law
 - b. Newton's Second Law
 - c. Newton's Third Law
2. Angular Velocity
3. Linear Velocity

I. BASIC AERODYNAMICS

1. Pressure
 - a. Pressure
 - 1) Pounds Per Square Inch
 - 2) Inches of Mercury

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- 3) Millibar
- b. Temperature
- c. Density
- 2. Laws of Physics Pertaining to Aerodynamics
 - a. The Law of Conservation of Energy
 - b. Newton's Laws of Motion
 - 1) Newton's First Law
 - 2) Newton's Second Law
 - 3) Newton's Third Law
 - 4) Bernoulli's Principle
- 3. The Airfoil
- 4. Aerodynamic Lift
 - a. Surface Area
 - b. Lift Coefficient
 - c. Dynamic Pressure
 - d. Boundary Layer and Stall
 - e. Lift Formula
- 5. Drag
 - a. Induced Drag
 - b. Parasite Drag
 - c. Total Drag
 - d. Lift/Drag Ratio
 - e. Center of Pressure Travel
- 6. The Axes of an Airplane
 - a. Longitudinal Axis
 - b. Lateral Axis

- c. Vertical Axis
- 7. Airplane Stability
 - a. Types of Stability
 - 1) Static Stability
 - 2) Dynamic Stability
 - b. Conditions of Stability
 - 1) Positive Stability
 - a) Positive Static Stability
 - b) Positive Dynamic Stability
 - 2) Negative Stability
 - a) Negative Stability
 - b) Negative Dynamic Stability
 - 3) Neutral Dynamic Stability
 - c. Stability About the Axis
 - 1) Longitudinal Stability
 - 2) Lateral Stability
 - 3) Directional Stability (Vertical)
 - 4) Dutch Roll and Spiral Instability
 - 5) Expedients to Gain Stability and Control
 - d. Primary Flight Controls
 - 1) Longitudinal Control
 - 2) Lateral Control
 - 3) Directional Control
 - e. Control System
 - 1) Longitudinal Control
 - 2) Lateral Control

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- 3) Auxiliary or Trim Tabs
- 4) Balance Tabs
- 5) Anti-servo Tabs
- 6) Servo Tabs
- f. Spring Controls
 - 1) Trim Tabs
 - 2) Adjustable Stabilizer
- 8. Auxiliary Lift Devices
 - a. Flaps
 - 1) Plain Flaps
 - 2) Split Flaps
 - 3) Slotted Flaps
 - 4) Fowler Flaps
 - b. Leading Edge Devices
 - 1) Slots
 - 2) Slats
 - 3) Leading Edge Flaps
 - 4) Stall Strips
 - c. Special Wing Tips
- 9. Control Systems for Large Aircraft
 - a. Types of Control Systems
 - 1) Lateral Control
 - 2) Directional Control

J. HIGH-SPEED AERODYNAMICS

- 1. Compressibility Effects
- 2. Importance of Speed of Sound

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3. Realms of Flight
 - a. Subsonic
 - b. Transonic
 - c. Supersonic
4. Supersonic Flow Patterns
 - a. Oblique Shock Waves
 - b. Normal Shock Waves
 - c. Expansion Waves
5. Airfoil Sections for High-speed Flight
6. Critical Mach Number
7. Supersonic Engine Inlets

K. FUNDAMENTALS OF ROTARY WING AIRCRAFT

1. History of Rotary Wing Flight
2. Configurations of Rotary Wing Aircraft
 - a. Autogiro
 - b. Dual Rotor Helicopter
 - c. Single Rotor Helicopter
3. Types of Rotor Systems
 - a. Semi-rigid Rotor
 - b. Fully Articulated Rotor
 - c. Rigid Rotor
4. Forces Acting on the Rotor
 - a. Gravity
 - b. Centrifugal Force
 - c. Lift
 - d. Gyroscopic Forces

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- 1) Rigidity
 - 2) Precession
 - 3) Coriolis Effect
5. Helicopter Flight Control
- a. No Wind Hovering Flight
 - 1) Torque Compensation
 - 2) Density Altitude
 - 3) Ground Effect
 - b. Vertical Ascent and Descent
 - c. Forward Flight
 - 1) Dissymmetry of Lift
 - 2) Retreating Blade Stall
 - 3) Translational Lift
 - 4) Autorotation
 - 5) Power Setting
 - d. Rotorcraft Controls
 - 1) Direct Rotor Head System
 - 2) Swash Plate Control System
 - a) Collective Pitch Control
 - b) Cyclic Pitch Control



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PERFORMANCE GOALS

J. BASIC PHYSICS

LEVEL

G-30: USE AND UNDERSTAND THE PRINCIPLES OF SIMPLE MACHINES: SOUND, FLUID, AND HEAT DYNAMICS; BASIC AERODYNAMICS; AIRCRAFT STRUCTURES AND THEORY OF FLIGHT. (2)

- A. Using Sketches of simple machines, illustrating the inclined plane, lever and the pulley, label the four sketches and indicate the effects of resistance, friction, efficiency, and mechanical advantage by arrows and descriptive notes.
- B. Answer questions concerning the relationship between pressure, volume, and temperature of an air mass.
- C. Using two diagrams without labels or direction arrows; indicate the relationship between pressure and the rate of flow of liquid through an orifice.
- D. Using sketches illustrating three methods of heat transfer, without titles or labels. Explain the relationship between temperature and heat. Identify two examples of where each is applied in an aircraft.
 - 1) Temperature effect on the speed of sound
 - 2) Origin of sound and resonance
 - 3) Reflection of sound waves
 - 4) Methods of control and reduction of excessive sound
 - 5) Methods of protection against excessive sound
- E. Using sketches illustrating three methods of heat transfer, without titles or labels. Explain the relationship between temperature and heat. Identify two examples of where each is applied in an aircraft.
- F. Identify and label the three axes of an aircraft and describe the displacement or motion about each of the axes.

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PRACTICAL PROJECT

J. BASIC PHYSICS

30-A: Use and Understand the Principles of Simple Machines; Sound, Fluid, and Heat Dynamics, Basic Aerodynamics, Aircraft Structure, and Theory of Flight.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the student with the required knowledge of simple machines and their importance in aviation mechanical applications

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

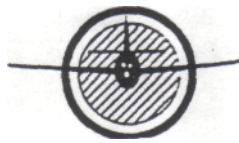
SUPPLIES AND MATERIALS REQUIRED:

1. Sketches of simple machines

PROCEDURE:

Given the sketches of simple machines you will identify and label each one. You will also indicate the effect of friction and resistance on the simple machines as well as the mechanical advantages and efficiency.

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PRACTICAL PROJECT

J. BASIC PHYSICS

30-B: Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics, aircraft structures; and theory of flight.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and understanding on the relationship between pressure, volume and temperature of an air mass.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS

None

SUPPLIES AND MATERIALS REQUIRED:

List of questions concerning the relationship between pressure, volume and temperature of an air mass.

PROCEDURE:

The student shall answer the questions on the list that is provided with the correct answer.

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PRACTICAL PROJECT

J. BASIC PHYSICS

30-C Use and Understand the Principles of Simple Machines; Sound, Fluid, and Heat Dynamics; Aircraft Structures; and Theory of Flight.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 4 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and understanding in the relationship between pressure, area and force applied in a hydraulic system and relationship between pressure and the rate of flow through an orifice.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

SUPPLIES AND MATERIALS REQUIRED:

1. Unlabeled diagrams to show relationship between pressure, area and force on hydraulic systems.
2. Unlabeled diagram to show relationship between pressure and rate of flow through and orifice.

PROCEDURE:

The student will be required to indicate the relationship between pressure, area and force on one diagram; and the relationship between pressure and rate of flow through an orifice on the second diagram.

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PRACTICAL PROJECT

J. BASIC PHYSICS

30-D: Use and Understand the Principles of Simple Machines; Sound Fluid and Heat Dynamics; Basic Aerodynamics; Aircraft Structures and Theory of Flight.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 4 Hrs

PURPOSE:

To acquaint the student with the required knowledge and understanding of sound origin, propagation and control.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

SUPPLIES AND MATERIALS REQUIRED:

1. Sketches of the origin, propagation and control of sound

PROCEDURE:

Given sketches of the origin, propagation and control of sound energy and using the information out of the above references; the student will write a brief explanation of:

- a. Origin of sound and resonance.
- b. Reflection of sound waves.
- c. Methods of control and reduction of excessive sound.
- d. Methods of protection against excessive sound.

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PRACTICAL PROJECT

J. BASIC PHYSICS

30-E: Use and Understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics, aircraft structures; and theory of flight

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 3 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and understanding of heat energy.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) "as amended"
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None.

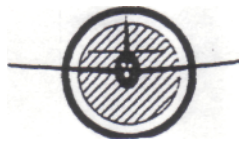
SUPPLIES AND MATERIALS REQUIRED:

1. Sketches illustrating three methods of heat transfer.
2. Examples of each as they apply to aircraft.

PROCEDURE:

Given sketches illustrating three (3) methods of heat transfer without titles or labels; the student will identify label, and explain the relationship between temperature and heat, listing two (2) examples of each as it applies to an aircraft.

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PRACTICAL PROJECT

J. BASIC PHYSICS

30-F: Use and Understand the Principles of Simple Machines; Sound, Fluid, and Heat Dynamics; Basic Aerodynamics, Aircraft Structures; and Theory of Flight.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 3 Hrs.

PURPOSE:

To acquaint the student with the required knowledge and understanding of the theory of flight and basic principles of aerodynamics on airplane and helicopters.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) "as amended"
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

None

SUPPLIES AND MATERIALS REQUIRED:

1. Number 2 pencil and paper

PROCEDURE:

Given the information of the theory of flight and basic aerodynamics presented on the reference mentioned above; the student will identify the three axes of an aircraft and explain the resulting motion or displacement of each how each one affect and/or is affected during flight.

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K. MAINTENANCE PUBLICATIONS

TOTAL HOURS:	33	THEORY:	18	SHOP/LAB:	15
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A. LOCATE REFERENCE DATA

1. FAA Specifications and Type Certificate Data Sheets
 - a. Purpose of Type Certificate Data Sheets
 - b. Information Contained in Type Certificate Data Sheets
 - c. Data Available for Aircraft that are Built in Limited Production
 - d. Conditions that must exist before an Aircraft is Transferred to the Listing

B. USE INFORMATION FROM THE AIRCRAFT SPECIFICATIONS TYPE CERTIFICATE DATA SHEETS

1. Identifying Aircraft Specifications
 - a. Use of Prefix and Suffix to Basic Model Number
 - b. Value of a Serial Number When Identifying Information in the Aircraft Specification
2. Weighing Information
 - a. Datum Locations
 - b. Leveling Means
 - c. Effect of Aircraft Category on Seating Capacity
3. C.G. Ranges
 - a. Significance of an Empty Weight C.G. Range
 - b. Why C.G. Ranges May be Different When the Aircraft May be Certified in Different categories.

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4. Items of Equipment
 - a. Required Equipment
 - b. Optional Equipment
 - c. Determining Make and Model Engine and Propeller Approved for Use on Specific Airplane
- C. USE INFORMATION FROM THE MANUFACTURERS MANUALS TO VERIFY CONTROL SURFACE TRAVEL**
 1. Control travel Reference Information
 2. Methods of Expressing Limits of Travel
- D. IDENTIFY AND RELATE REGULATIONS GOVERNING AIRWORTHINESS CERTIFICATES**
 1. Applicability of Federal Air Regulations to Aircraft Airworthiness Certificates
 - a. Why Aircraft Serial Numbers Appear on the Airworthiness certificates
 - b. Why Airworthiness Certificates are a Part of Permanent Maintenance Record
 - c. How an Airworthiness Certificates is Kept Current
- E. SELECT AND USE TECHNICAL STANDARD ORDERS**
 1. Definition and Purpose of TSO
 2. Relationship of a TSO and 14 CFR Part
 3. Legal Status of a TSO
 4. Comparison of a TSO Part with a Non-TSO Part
- F. USE MANUFACTURER'S MANUALS AND OTHER PUBLICATIONS**
 1. Service and Maintenance Manuals
 2. Overhaul Manuals
 3. Structural Repair Manuals
 4. Illustrated Parts Catalog

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5. Tables of Service Limits and Torque Values

6. Service Bulletins, Letters, and Instructions

G. SELECT AND USE SUPPLEMENTARY TYPE CERTIFICATES AND AIRWORTHINESS DIRECTIVES

1. Airworthiness Directives

a. Categories of Airworthiness Directives

b. Responsibilities for Issuing Airworthiness Directives

c. Applicability of Airworthiness Directives

2. Supplementary Type certificates

a. Purpose of an STC

b. Who May Apply for a STC?

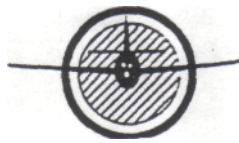
c. Manner in Which an AD May Apply to an Airplane Modified to Comply with an STC

H. READ, UNDERSTAND, AND RELATE TECHNICAL INFORMATION

1. Sources of Technical Reports

2. How Service Bulletins and Service Letters Originate

3. Time of Required Compliance



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PERFORMANCE GOALS

K. MAINTENANCE PUBLICATIONS	LEVEL
G-31: DEMONSTRATE ABILITY TO READ, COMPREHEND AND APPLY INFORMATION CONTAINED IN FAA AND MANUFACTURER'S AIRCRAFT MAINTENANCE SPECIFICATIONS, DATA SHEETS, MANUALS, PUBLICATIONS AND RELATED FEDERAL AVIATION REGULATIONS, AIRWORTHINESS DIRECTIVES AND ADVISORY MATERIAL.	(3)
A. Given a reference summary file of airworthiness directives, write a complete list of all AD's applicable to a specified make and model aircraft.	
B. Using the FAA specification and type certificate data sheets for a specified aircraft, locate and list, useful load and center of gravity range, location of the pilots and passenger seats, one propeller and engine combination and propeller diameter, and required placards.	
C. Using a sample copy of an airworthiness certificate and the FAA-H-8083-30A, interpret the information displayed on the sample, and explain the purpose, duration, and requirements for keeping the certificate in effect.	
G-32: READ TECHNICAL DATA	(3)
A. Using the manufacturer's maintenance manual for specified aircraft; determine the control surface travel limits, reference planes used in measuring control surface movement.	
B. Using manufacturer's service manual, inspection aids, etc., interpret and apply this information as a method of solving two maintenance problems described by the instructor.	

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PRACTICAL PROJECT

K. MAINTENANCE PUBLICATIONS

31-A Demonstrate Ability to Read, Comprehend and Apply Information Contain in FAA and Airworthiness Directives.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3 Hrs.

PURPOSE:

To acquaint the student with the required knowledge to read and interpret airworthiness directives reference summary.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Reference Summary of Airworthiness Directives

EQUIPMENT AND TOOLS REQUIRED:

1. Computer with Internet access

SUPPLIES AND MATERIALS REQUIRED:

1. FAA web site for online AD research

PROCEDURE:

Given internet access; the student will write a complete list of all applicable AD'S for a specific aircraft, engine and/or propeller make and model (as specified by the instructor).

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K. MAINTENANCE PUBLICATIONS

31-B Demonstrate Ability to Read, Comprehend and Apply Information Contain in FAA specifications and Type Certificate Data Sheets.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3 Hrs.

PURPOSE:

To acquaint the student with the required knowledge to read and interpret FAA -specifications and Type Certificate Data Sheets.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. Aircraft Specifications and Type Certificate Data Sheets

EQUIPMENT AND TOOLS REQUIRED:

1. Computer with Internet access

SUPPLIES AND MATERIALS REQUIRED:

1. FAA web site for online Type Certificate Data Sheet

PROCEDURE:

Given internet access to FAA Aircraft Specifications and Type Certificate Data Sheets for Specific Aircraft; the student will list the aircraft useful load, center of gravity range, location of the pilots, location of passenger seats, one propeller/engine combination, propeller diameter and required placards.

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K. MAINTENANCE PUBLICATIONS

31-C Demonstrate Ability to Read, Comprehend and Apply Information Contain in Airworthiness Certificate, duration and requirements,

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3 Hrs.

PURPOSE:

To acquaint the student with the required knowledge to read and interpret information displayed on an aircraft airworthiness certificate.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A, “as amended”)
2. A&P Technician General Textbook
3. Aircraft Certificate Regulation Handbook (14 CFR Part 147)

EQUIPMENT AND TOOLS REQUIRED:

1. None

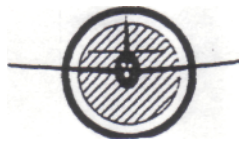
SUPPLIES AND MATERIALS REQUIRED:

1. Sample of aircraft airworthiness certificate.

PROCEDURE:

Given aircraft airworthiness certificate sample; the student will interpret the information displayed and will explain the purpose, duration and requirements for keeping the certificate in effect.

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K. MAINTENANCE PUBLICATIONS

32-A Read Technical Data

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 3 Hrs.

PURPOSE:

To acquaint the student with the required knowledge to read and interpret information of a manufacturer's maintenance manual.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) "as amended"
2. A&P Technician General Textbook
3. Applicable Aircraft Maintenance Manual

EQUIPMENT AND TOOLS REQUIRED:

1. None

SUPPLIES AND MATERIALS REQUIRED:

1. Applicable aircraft maintenance manual.

PROCEDURE:

Given a specific aircraft and the manufacturer's maintenance manual; the student will read and interpret information necessary to determine the control surfaces travel limits and the reference planes used in measuring the specific control surfaces movement.

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K. MAINTENANCE PUBLICATIONS

32-B Read Technical Data

TEACHING LEVEL: 3

AVERAGE COMPLETION TIME: 3 Hrs.

PURPOSE:

To acquaint the student with the required knowledge to read and interpret aircraft manufacturer's service manual.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) "as amended"
2. A&P Technician General Textbook
3. Applicable Maintenance Service Manual

EQUIPMENT AND TOOLS REQUIRED:

1. None

SUPPLIES AND MATERIALS REQUIRED:

1. Aircraft Maintenance Service Manual.

PROCEDURE:

Given an aircraft manufacturer's maintenance service manual and inspection aids information; the student will read and interpret information necessary to solve two (2) maintenance problems described to the student by the instructor. The student will explain to the instructor a simulated return to service.

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L. MECHANIC PRIVILEGES AND LIMITATIONS

TOTAL HOURS: 10	THEORY: 6	SHOP/LAB: 4
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A. INTERPRET 14 CFR Part 65

Eligibility Requirements for a Mechanic Certificate

1. Ratings
2. Knowledge Requirements
3. Experience Requirements
4. Skill Requirements
5. General Privileges and Limitations
6. Recent Experience Requirements
7. Airframe Rating: Additions Privileges
8. Display of Certificate
9. Duration of Certificate
10. Change of Address

B. INTERPRET 14 CFR Part 43

1. Applicability
2. Persons Authorized to Perform Maintenance, Repair, etc.
3. Return to Service
4. Persons Authorized to Approve Return to Service
5. Content, Form, and Disposition of Maintenance rebuilding and Alterations Records.

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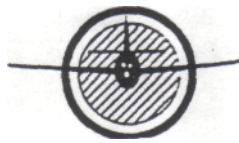
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6. Content Form, and Disposition of Annual, 100 Hour, and Progressive Inspection Records
7. Performance Rules (General)
8. Additional Performance Rules for Inspections
9. Appendix “A”

C. INTERPRET 14 CFR Part 1

1. Definitions
 - a. Maintenance
 - b. Major Alterations
 - c. Major Repair
 - d. Minor Alterations
 - e. Minor Repair
 - f. Preventive Maintenance



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PERFORMANCE GOALS

L.	MECHANIC PRIVILEGES AND LIMITATIONS	LEVEL
G-33:	EXERCISE MECHANIC PRIVILEGES WITHIN THE LIMITATIONS PRESCRIBED BY PART 65 OF THIS CHAPTER	(3)
A.	Using Part 65 of the 14 CFR Part 147 read interpret the regulation; answer questions concerning 14 CFR Part 65.	



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PRACTICAL PROJECT

L. MECHANIC PRIVILEGES AND LIMITATIONS

33-A Exercise Mechanic Privileges within the Limitations prescribed by Part 65 of this chapter

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 4 Hrs.

PURPOSE:

To acquaint the student with the required knowledge to answer questions from 14 CFR Part 65 related to mechanics privileges and limitations.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook

EQUIPMENT AND TOOLS REQUIRED:

1. None

SUPPLIES AND MATERIALS REQUIRED:

1. List of questions related to 14 CFR Part 65.

PROCEDURE:

Given list of questions related to A&P mechanic privileges and limitations from 14 CFR Part 65; the student must answer correctly with at least 70% grade approval.

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M. SAFETY COMMUNICATIONS PROGRAM

TOTAL HOURS: 24

THEORY: 18

SHOP/LAB: 6

A. PUBLIC LAW 91-596 – OCCUPATIONAL SAFETY AND HEALTH ACT

1. Congressional Finding and Purpose
2. Applicability of this Act
3. Duties and Responsibility
4. Introduction to OSHA
5. Introduction to OSHA Standards

B. SAFETY RULES IN VOCATIONAL SCHOOL SHOPS

1. Shop and Equipment Lay-out
2. Shop Lighting
3. Shop Ventilation
4. Personal Protection Equipment
5. Electrical Safety
6. Safety Around Power Machines
7. Safety with Welding Equipment
8. Actions to be Taken in Case of an Accident

C. EFFECTS OF WORK ACCIDENTS IN PUERTO RICO

1. Deaths due to Accidents
2. Cost to the Government and Private Enterprise

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D. INTRODUCTION TO GROUND SAFETY

1. Electrical Safety
 - a. Danger of Electricity in Human Body
 - b. Water as an Electrical Conductor
 - c. Shop 110/120 Volts Electricity
 - d. Wall Outlets and Extension Cords
2. Radiation Hazards.
 - a. Radiation Materials in Aircraft
 - b. Precautions when Working With Radioactive Materials
3. Hazard Communication Program
 - a. OSHA Standard 29, CFR 1910.1200
 - b. Shop Formal Written Program
 - c. Hazardous Material Inventory
 - d. Material safety Data Sheet (SDS)
 - e. Containers Labeling
4. Safety Around Machine Tools
 - a. Qualification to Work With Machine Tools
 - b. Machine Safety Covers
 - c. Dull Cutting Tools
 - d. Working With Drill Press
 - e. Eye Protection
 - f. Appropriate Clothing When Working in the Shop
5. Welding
 - a. Welding Area

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- b. Welding Tables
- c. Ventilation
- d. Fire Protection
- e. Personal Protection
- 6. Fire Safety
 - a. Nature of Fire, Heat-Oxygen-Matter
 - b. Classification of Fire
 - c. Type of Fire Extinguishers
 - d. Checking fire Extinguishers
 - e. Proper use of Fire Extinguishers
- 7. Safety Around Compressed Gases
 - a. Danger When Handle High Pressure Cylinders
 - b. Precautions When Working with Oxygen
 - c. Working With Pneumatic Tools
 - d. Checking Fire Extinguishers
 - e. Proper use of Fire Extinguishers
- 8. Machine Lock-out Station Board
 - a. Lock-out Station Board
 - b. Responsibility
 - c. Procedures



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PERFORMANCE GOALS

M.	SAFETY COMMUNICATIONS PROGRAM	<u>LEVEL</u>
G-34:	UNDERSTAND, MATERIAL SAFETY DATA SHEET PROGRAM	(2)
A.	The student will search and study the content of an appropriate SDS in file and answer a number of questions given by the instructor.	
G-35:	MACHINE LOCK-OUT PROCEDURE	(2)
A.	Given the necessary equipment and text material the student will demonstrate in the shop machines the proper procedures to comply with a machine lock-out and to return it to service.	
G-36:	INSPECTION AND USE OF FIRE EXTINGUISHERS	(3)
A.	The student will inspect all the fire extinguishers in each station and report any discrepancy noted. He will explain and demonstrate the proper use of the fire extinguisher.	



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M. SAFETY COMMUNICATION PROGRAM

34-A Material Safety Data Sheet (SDS)

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 2Hrs.

PURPOSE:

To acquaint the student with the required knowledge to work with and understand the SDS program.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. OSHA Standards
4. Safety Program Pamphlet.
5. SDS

EQUIPMENT AND TOOLS REQUIRED:

1. SDS File Binder

SUPPLIES AND MATERIALS REQUIRED:

1. List of questions related to SDS.

PROCEDURE:

Using the SDS file binder available the student will search for the information requested and answer a number of questions given by the instructor.

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M. Safety Communication Program

Practical Project 34-A (continued :)

Using the reference material on previous page answer the following questions:

1. A material Safety Data Sheet consists of nine or more sections, which are:

- I. _____
- II. _____
- III. _____
- V. _____
- VI. _____
- VII. _____
- VII. _____
- VIII. _____
- IX. _____
- X. _____

2. The four (4) colors of a typical hazard label are:

- A. _____
- B. _____
- C. _____
- D. _____

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Practical Project 34-A (continued :)

3. What type of personal protection is required when the letter K appears in the hazard label's white area?

Answer: _____

4. The read area of the hazard label indicates:

Answer: _____



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M. SAFETY COMMUNICATION PROGRAM

35-A Machine lock-out procedure.

TEACHING LEVEL: (2)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To acquaint the student with the required knowledge in the proper procedure to lock-out powers machines.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) “as amended”
2. A&P Technician General Textbook
3. OSHA Standards
4. Safety Program Pamphlet.

EQUIPMENT AND TOOLS REQUIRED:

1. Machine tools.

SUPPLIES AND MATERIALS REQUIRED:

1. Lock-out station board.

PROCEDURE:

The student will be furnished with lock-out station board and components.
He/she will demonstrate the procedure to properly perform a lock-out of a power machine; he/she shall also return it to service.

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M. SAFETY COMMUNICATION PROGRAM

36-A Inspection and use of fire extinguishers.

TEACHING LEVEL: (3)

AVERAGE COMPLETION TIME: 2 Hrs.

PURPOSE:

To introduce the student into sound training in the proper inspection, maintenance and use of fire extinguishers, also learn the location of each fire extinguisher station in the shop.

REFERENCES:

1. Aviation Maintenance Technician Handbook (FAA-H-8083-30A) "as amended"
2. A&P Technician General Textbook
3. OSHA Standards
4. Safety Program Pamphlet.

EQUIPMENT AND TOOLS REQUIRED:

1. Fire extinguishers

SUPPLIES AND MATERIALS REQUIRED:

1. A drawing showing all fire extinguishers stations by number in use in the shop.

PROCEDURE:

The student will be furnished with drawing showing all fire extinguishers in use. He/she will inspect each and every one and report in writing any discrepancy noted. Explain and demonstrate the proper use of a fire extinguisher.

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Practical Project 36A (continued :)

Fire Extinguishers Status

CONDITION CODE

A – 12 Months Inspection Due

B - 30 Days Inspection Due

C – Low Pressure Indication

D – Safety Pin Missing

E - Trigger Seal Broken

STATION NO.	LOCATION	TYPE	CODE	REMARKS
1		Dry-Chem		
2		Dry-Chem		
3		Dry-Chem		
4		Dry-Chem		
5		Dry-Chem		
6		Dry-Chem		
7		Dry-Chem		
8		Dry-Chem		
9		Dry-Chem		
10		Dry-Chem		
11		Dry-Chem		
12		Dry-Chem		
13		Dry-Chem		
14		Dry-Chem		
15		Dry-Chem		
16		Dry-Chem		
17		Dry-Chem		
18		Dry-Chem		
19		Dry-Chem		
20		Dry-Chem		
21		Dry-Chem		
22		Dry-Chem		
23		Dry-Chem		
24		Dry-Chem		

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GLOSSARY OF TERMS AND DEFINITIONS (continued :)

<i>1</i>	GLOSSARY OF TERMS AND DEFINITIONS
<i>2</i>	TEXTBOOKS REQUIRED BY THE STUDENTS
<i>3</i>	CURRICULUM REQUIREMENTS
<i>4</i>	GENERAL CURRICULUM SUBJECTS
<i>5</i>	STUDENT WORKBOOK – PRACTICAL PROJECT RECORD

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GLOSSARY OF TERMS AND DEFINITIONS (continued :)

GLOSSARY OF TERMS AND DEFINITIONS

<u>AC</u>	:	Aircraft of Alternating Current
<u>AC Chock</u>	:	Block of material wedged under the tires of an aircraft to act as a safety for the brakes and to prevent inadvertent rolling of the aircraft.
<u>AC 43.13-1B</u>	:	An Advisory Circular in a book form issued by the FAA which cover Acceptable methods, techniques, and practices for aircraft inspection and repair. The procedures that are described in this advisory circular are considered acceptable maintenance and repairs by the Administrator.
<u>AC 43.13-2B</u>	:	An Advisory Circular in a book form issued by the FAA which cover Acceptable methods, techniques, and practices for aircraft inspection and practices. The procedures that are described in this advisory circular are considered acceptable maintenance and alterations by the Administrator.
<u>FAA-H-8083-30A</u>	:	Student handbook reference for the General Section of this A&P Course.
<u>AC Circuit</u>	:	Alternating current circuits. In these circuits the flow direction of electrons periodically reverse and their amplitude continually change.
<u>Airworthiness</u>	:	Means when an aircraft is found to conform to the type certificate therefore, to be in condition for safe operation, and has been shown to meet the requirement of the applicable comprehensive and detailed airworthiness code as provide by Annex 8 to the Convention on International Civil Aviation.
<u>Airworthiness Certificate</u>	:	A certificate issued by the FAA to all Aircraft which have met the minimum standards required for certification.
<u>Aircraft, Engine Or Propeller Specifications</u>	:	Normally, referred to the approved production specification. This is information about parts, equipment, or accessories approved for that particular make and model under their production certificate
<u>Aircraft Flight</u>	:	Approved information which must be carried in any aircraft. This

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GLOSSARY OF TERMS AND DEFINITIONS (continued :)

<u>Manual</u>	:	pertains to the speed, engine operating limits and any other information that is vital to the pilot.
<u>Aircraft Type Certificate Data Sheet</u>	:	The official specifications of a aircraft, engine, or propeller. These are used by the FAA. For an aircraft, engine or propeller to be airworthy, it must conform to these specifications.
<u>Aircraft Weight & Balance Report</u>	:	Aircraft records that provide the information required on the weight of the empty aircraft and the location of its center of gravity (CG).
<u>Aircraft Empty Weight C.G.</u>	:	Is the center of gravity of an aircraft in its empty weight condition.
<u>AN or NAS</u>	:	Aviation quality hardware. AN–Air Force and Navy. NAS – National Aircraft standards.
<u>AN Fittings</u>	:	A series of fittings for flared tubing, using 37-degree flare angle and having a small shoulder between the ends of the treaded areas.
<u>AV-Gas</u>	:	Aviation Fuel
<u>Center of Gravity (C.G.)</u>	:	Is the point about which the weight of an aircraft or objects is concentrated.
<u>C.G. Range</u>	:	Allowable variation of travel with the center or gravity limits.
<u>Check</u>	:	To verify proper operation.
<u>D'Arsonval meter Movement</u>	:	Basic direct current meter movements. It is a current measuring device which is used in ammeter, voltmeter, and ohmmeter
<u>DC Circuits</u>	:	Electrical circuits where the flow of electrons is in one direction throughout the circuits
<u>FAA</u>	:	Federal Aviation Administration
<u>14 CFR Part 147</u>	:	Federal Aviation Regulation
<u>14 CFR Part 1</u>	:	Federal Aviation Regulation that gives us the legal definition and abbreviation that pertains to all aviation operations.
<u>14 CFR Part 43</u>	:	Federal Aviation Regulation that gives us the legal requirements for maintenance, preventive maintenance, rebuilding, repair, and alteration of certificated aircraft

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GLOSSARY OF TERMS AND DEFINITIONS (continued :)

<u>14 CFR Part 65</u>	:	Federal Aviation Regulation that states the personnel requirements portion of the 14 CFR Part 65. It deals with the certification of mechanics, repairmen, air traffic control tower operators, aircraft dispatchers and parachute riggers.
<u>14 CFR Part 91</u>	:	Federal Aviation Regulation that contains the general operating and flight rules. This part includes the requirements for maintenance inspections and record keeping.
<u>FAA Form 337</u>	:	Federal Aviation Form required to record major repairs and major alterations performed on any aircraft airframe, powerplant, propeller of appliance.
<u>Hand Taxi Signals</u>	:	Hand signals used by ground personnel to visually communicate with the pilot while in the ground and aid him during ground movement or taxing of an aircraft.
<u>Hydrometer</u>	:	A device used to measure specific gravity of a liquid.
<u>Inspect</u>	:	To examine by sight and touch.
<u>ITP-G Textbook</u>	:	Student Textbook reference for the General Section of his A&P course.
<u>Jet Fuel</u>	:	(Jet-P4/ Jet A / Jet B, etc) is a Kerosene base fuel, specially designed for aviation turbines use.
<u>Lead Acid Battery</u>	:	A commonly used battery that consist of a secondary cell having lead as it negative plate, and lead peroxide as it positive plate; Sulfuric Acid and water as the electrolyte.
<u>MS Flareless Fittings</u>	:	A form of fluid line fitting used on some hydraulic lines. Instead of using a formed flare on the end of the tube, a compression sleeve is forced into the tube and when tightened onto a recess in the attachment fitting to form a fluid-tight sealing surface.
<u>Ni-Cad Battery</u>	:	Nickel Cadmium battery. A battery made up of alkaline secondary cells. The positive plates are made of nickel hydroxide, and potassium hydroxide is used as the electrolyte.
<u>Ohm's Law</u>	:	The law that establish the relationship between current, voltage, and resistance in an electrical circuit. The current in a circuit is directly proportional to the resistance of the circuit.

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GLOSSARY OF TERMS AND DEFINITIONS (continued :)

<u>Overhaul</u>	:	To disassemble, inspect, repair as necessary, reassemble and check.
<u>Repair</u>	:	To correct a defective condition. Repair of an airframe or powerplant system including component replacement and adjustment, but not component repair.
<u>Service</u>	:	To perform functions that assures continued operation.
<u>Specific Gravity</u>	:	The ratio of weight of a given volume of material to the same volume of water.
<u>Standard</u>	:	The degree of excellence required for a particular purpose.
<u>STC</u>	:	Stands for Supplemental Type Certificate.
<u>Test</u>	:	To submit unit, component, etc. to conditions which will show its quality, strength, operational condition, etc.
<u>Time in Service</u>	:	Is the time from an aircraft leaves the surface of the earth, until it touches it at the next point of landing.
<u>Troubleshoot</u>	:	To analyze and identify malfunctions.
<u>TSO</u>	:	Stands for Technical Standard Order. It is issued by the Administrator and it is a minimum performance standard for a specific article used on civil aircraft.



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GENERAL COURSE CURRICULUM MANUAL

TEXTBOOKS REQUIRED BY THE STUDENTS

1. Aviation Maintenance Technician Handbook - General
FAA-H-8083-30A, as revised
2. A&P Technician General Textbook
Jeppesen
3. General Technician Test Guide with oral and practical Study Guide - Jeppesen
4. The Aviation Dictionary - Jeppesen
5. Acceptable Methods, Techniques, and Practices Aircraft Inspection and Repair
AC 43.13-1B/2B, as revised
6. 14 CFR Part 147 AMT – Federal Aviation Regulations for Aviation Maintenance Technicians “as amended”

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**GENERAL COURSE CURRICULUM MANUAL
CURRICULUM REQUIREMENTS**

This is the description of the level of proficiency at which items under each subject in the curriculum shall be taught.

TEACHING LEVELS:

- (1) Level 1 requires:
 - (i) Knowledge of general principles, but not practical application.
 - (ii) No development of manipulative skill
 - (iii) Instruction by lecture, demonstration and discussion.
- (2) Level 2 requires:
 - (i) Knowledge of general principles, and limited practical application.
 - (ii) Development of sufficient manipulative skill to perform basic operations
 - (iii) Instruction by lecture, demonstration, discussion and limited practical application.
- (3) Level 3 requires:
 - (i) Knowledge of general principles, and performance of high degree of practical application.
 - (ii) Development of sufficient manipulative skill to simulate return to service.
 - (iii) Instruction by lecture, demonstration, discussion, and a high degree of practical application.



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GENERAL COURSE CURRICULUM MANUAL
GENERAL CURRICULUM SUBJECTS

This list is the subjects required in the 430 hours in the General Curriculum.

The number in parentheses before each item listed under each subject heading indicates the level of proficiency at which that item shall be taught.

A. BASIC ELECTRICITY

- (2) 1. Calculate and measure capacitance and inductance.
- (2) 2. Calculate and measure electrical power.
- (3) 3. Measure voltage, current, resistance, and continuity.
- (3) 4. Determine the relationship of voltage, current, and resistance in electrical circuits.
- (3) 5. Read and interpret aircraft electrical circuit diagrams, including Solid State devices and logic functions.
- (3) 6. Inspect and service batteries.

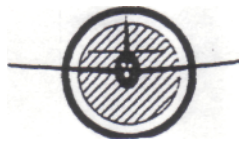
B. AIRCRAFT DRAWINGS

- (2) 7. Use aircraft drawings, symbols, and systems schematics
- (3) 8. Draw sketches of repairs and alterations
- (3) 9. Use blueprint information
- (3) 10. Use graphs and charts

C. WEIGHT AND BALANCE

- (2) 11. Weight Aircraft
- (3) 12. Perform complete weight-and-balance check and record data

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D. FLUID LINES AND FITTINGS

- (3) 13. Fabricate and install rigid and flexible fluid lines and fittings

E. MATERIALS AND PROCESSES

- (1) 14. Identify and select appropriate nondestructive testing methods.
- (2) 15. Perform dye Penetrant, eddy current, ultrasonic, and magnetic particle inspections
- (1) 16. Perform basic heat-treating processes
- (3) 17. Identify and select aircraft hardware and materials
- (3) 18. Inspect and check welds
- (3) 19. Perform precision measurements

F. GROUND OPERATION AND SERVICING

- (2) 20. Start, ground operate, move, service, and secure aircraft and identify typical ground operation hazards.
- (2) 21. Identify and select fuels

G. CLEANING AND CORROSION CONTROL

- (3) 22. Identify and select cleaning materials
- (3) 23. Inspect, identify, remove and treat aircraft corrosion and perform aircraft training.

H. MATHEMATICS

- (3) 24. Extract roots and raise numbers to given power
- (3) 25. Determine areas and volumes of various geometrical shapes

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- (3) 26. Solve ratio, proportion, and percentage problems.
- (3) 27. Perform algebraic operations involving addition, subtraction, multiplication and division of positive and negative numbers.

I. MAINTENANCE FORMS AND RECORDS

- (3) 28. Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records.
- (3) 29. Complete required maintenance forms, records, and inspections reports.

J. BASIC PHYSICS

- (2) 30. Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics, aircraft structures; and theory of flight.

K. MAINTENANCE PUBLICATIONS

- (3) 31. Demonstrate ability to read, comprehend, and apply information contained in FAA and manufactures aircraft maintenance specifications, data sheets, Manuals, publications, and related Federal Aviation Regulations, Airworthiness Directives, and Advisory material.
- (3) 32. Read technical data

L. MECHANIC PRIVILEGES AND LIMITATIONS

- (3) 33. Exercise mechanic privileges within the limitations prescribed by Part 65 of this chapter.

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M. SAFETY COMMUNICATIONS PROGRAM

- (2) **34:** The student will search and study the content of an appropriate SDS in file and answer a number of questions given by the instructor.
- (2) **35:** Given the necessary equipment and text material the student will demonstrate in the shop machines the proper procedures to comply with a machine lock-out and to return it to service.
- (3) **36:** The student will inspect all the fire extinguishers in each station and report any discrepancy noted. He will explain and demonstrate the proper use of the fire extinguisher.



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**STUDENT WORKBOOK
GENERAL CURRICULUM**

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GENERAL COURSE CURRICULUM MANUAL

PRACTICAL PROJECT RECORD

Student Name: _____

Student Num: _____

Instructor: _____

Group: _____

GENERAL COURSE

A. BASIC ELECTRICITY – Practical Projects: 8

Number	Practical Project Title	Level	Hours	Evaluation Grade
1 – A	Calculate and Measure Capacitance and Inductance, AC	2		
2 – A	Calculate and Measure Electrical Power, DC	2		
2 – B	Calculate and Measure Electrical Power, AC	2		
3 – A	Measure Voltage, Current, Resistance and Continuity	3		
4 – A	Determine the Relationship of Voltage, Current and Resistance in Electrical Circuits, DC	3		
4 – B	Determine the Relationship of Voltage, Current and Resistance in Electrical Circuits, AC	3		
5-A	Read and Interpret Aircraft Electrical Circuits Diagrams Including Solid State Devices and Logic Functions	3		
6 - A	Inspect and Service Batteries	3		
	TOTALS			

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B. AIRCRAFT DRAWINGS – Practical Projects: 5

Number	Practical Project Title	Level	Hours	Evaluation Grade
7 – A	Use Aircraft Drawings, Symbols and Systems Schematics	2		
7 – B	Use Aircraft Drawings, Symbols and Systems Schematics	2		
8 – A	Draw Sketches of Repairs and Alterations	3		
9 – A	Use Blueprint Information	3		
10 – A	Use Graphs and Charts	3		
	TOTALS			

C. WEIGHT AND BALANCE – Practical Projects: 4

Number	Practical Project Title	Level	Hours	Evaluation Grade
11 – A	Weigh Aircraft	2		
12 – A	Perform Complete Weight and Balance Check and Record Data	3		
12 – B	Perform Complete Weight and Balance Check and Record Data	3		
	TOTALS			

D. FLUID LINES AND FITTINGS – Practical Projects: 2

Number	Practical Project Title	Level	Hours	Evaluation Grade
13 – A	Fabricate and Install Rigid Fluid Lines and Fittings	3		
13 – B	Fabricate and Install Flexible Fluid Lines	3		
	TOTALS			

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E. MATERIALS AND PROCESSES – Practical Projects: 11

Number	Practical Project Title	Level	Hours	Evaluation Grade
14 – A	Identify and Select Appropriate Non-destructive Testing Methods	1		
15 – A	Perform Dye Penetrant and Magnetic Particle Inspections	2		
15 – B	Perform Eddy Current Inspections	2		
15 – C	Perform Ultrasonic Inspections	2		
16 – A	Perform Basic Heat-Treating Processes	1		
17 – A	Identify and Select Aircraft Hardware	3		
17 – B	Identify and Select Aircraft Materials	3		
17 – C	Identify and Select Aircraft Hardware and Materials	3		
18 – A	Inspect and Check Welds	3		
19 – A	Perform Precision Measurements	3		
	TOTALS			

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E. GROUND OPERATION AND SERVICING - Practical Projects: 5

Number	Practical Project Title	Level	Hours	Evaluation Grade
20 – A	Start, Ground Operate, Move, service, and Secure Aircraft and Identify Typical Ground Operation Hazards	2		
20 – B	Start, Ground Operate, Move, service, and Secure Aircraft and Identify Typical Ground Operation Hazards	2		
20 – C	Start, Ground Operate, Move, service, and Secure Aircraft and Identify Typical Ground Operation Hazards	2		
21 – A	Identify and Select Fuels	2		
	TOTALS			

F. Cleaning and Corrosion Control - Practical Projects: 3

Number	Practical Project Title	Level	Hours	Evaluation Grade
22 – A	Identify and Select Cleaning Materials	3		
23 – A	Inspect, Identify, Remove, and Treat Aircraft Corrosion and Perform Aircraft Cleaning	3		
23 - B	Inspect, Identify, Remove, and Treat Aircraft Corrosion and Perform Aircraft Cleaning	3		
	TOTALS			

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GENERAL CURRICULUM SUBJECTS (continued :)

G. MATHEMATICS – Practical Projects: 4

Number	Practical Project Title	Level	Hours	Evaluation Grade
24 – A	Extract Roots and Raise Numbers to Given Power	3		
25 – A	Determine Areas and Volumes of Various Geometrical Shapes	3		
26 – A	Solve Ratio, Proportion and Percentage Problems	3		
27 – A	Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers	3		
	TOTALS			

H. MAINTENANCE FORMS AND RECORDS – Practical Projects: 4

Number	Practical Project Title	Level	Hours	Evaluation Grade
28 – A	Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records	3		
29 – A	Complete required maintenance forms, records, and inspections reports	3		
29 – B	Complete required maintenance forms, records, and inspections reports	3		
29 – C	Complete required maintenance forms, records, and inspections reports	3		
	TOTALS			

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I. BASIC PHYSICS – Practical Projects: 6

Number	Practical Project Title	Level	Hours	Evaluation Grade
30 – A	Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics, aircraft structures; and theory of flight	2		
30 – B	Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics, aircraft structures; and theory of flight	2		
30 – C	Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics, aircraft structures; and theory of flight	2		
30 – D	Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics, aircraft structures; and theory of flight	2		
30 – E	Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics, aircraft structures; and theory of flight	2		
30 – F	Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics, aircraft structures; and theory of flight	2		
	TOTALS			

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J. MAINTENANCE PUBLICATIONS – Practical Projects: 5

Number	Practical Project Title	Level	Hours	Evaluation Grade
31 – A	Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturer's aircraft maintenance specifications, data sheet, manuals, publications and related Federal Aviation Regulations, Airworthiness Directives, and advisory materials.	3		
31 – B	Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturer's aircraft maintenance specifications, data sheet, manuals, publications and related Federal Aviation Regulations, Airworthiness Directives, and advisory materials.	3		
31 – C	Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturer's aircraft maintenance specifications, data sheet, manuals, publications and related Federal Aviation Regulations, Airworthiness Directives, and advisory materials.	3		
32 – A	Read Technical Data	3		
32 – B	Read Technical Data	3		
	TOTALS			

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K. MECHANICS PRIVILEGES AND LIMITATIONS – Practical Projects 1

Number	Practical Project Title	Level	Hours	Evaluation Grade
33 – A	Exercise mechanics privileges within the limitations prescribed by Part 65 of this chapter	3		
	TOTALS			

L. SAFETY COMMUNICATIONS PROGRAM – Practical Projects 3

Number	Practical Project Title	Level	Hours	Evaluation Grade
34 – A	The student will search and study the content of an appropriate SDS in file and answer a number of questions given by the instructor	2		
35-A	Given the necessary equipment and text material the student will demonstrate in the shop machines the proper procedures to comply with a machine lock-out and return it to service.	2		
36 – A	The student will inspect all the fire extinguishers in each station and report any discrepancy noted. He will explain and demonstrate the proper use of the fire extinguisher.	3		
	TOTALS			

TOTAL PRACTICAL PROJECTS: 58

TOTAL HOURS: _____

GENERAL AVERAGE: _____

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