

FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: AMT 1753

COURSE TITLE: Aviation Maintenance Technology General III

PREREQUISITE(S): None

COREQUISITE(S): None

CREDIT HOURS: 3

CONTACT HOURS/WEEK: 8

CONTACT HOUR BREAKDOWN:

Lecture/Discussion:	4
Laboratory:	4
Other <u>lecture/lab combination</u> :	

FACULTY WORKLOAD POINTS: 4

STANDARDIZED CLASS SIZE ALLOCATION: 25 (FAA Limited)

COURSE DESCRIPTION: This course is designed to introduce basic electricity and DC electrical circuits; aircraft battery service and inspection; AC electrical circuits and solid-state circuits.

SUGGESTED TEXT(S):	<u>TITLE</u>	<u>NUMBER</u>
Jeppesen A&P	Technician General Textbook	ISBN#0-88487-203-3
Jeppesen A&P	Technician General Workbook	ISBN #0-88487-212-2
Jeppesen A&P	Technician General Test Guide	ISBN #0-89100-449-1
FAA AC 43.13-1B/2A	Acceptable Methods, Techniques & Practices	ISBN #0-89100-306-1
FAR Handbook for Aviation Maintenance Technicians		ISBN #0-88487-314-5
Aviation Mechanic Handbook, by Dale Crane		#ASA-M-HB1

IMPLEMENTATION DATE: Summer Term, 2006 (20063)

REVIEW OR MODIFICATION DATE: Fall Term, 2008 (20091) - Outline Review 2007

COURSE TOPICS

CONTACT HOURS
PER TOPIC**Note: § Denotes required project**

I. BASIC ELECTRICITY AND DC CIRCUITS

35

A. Safety and Terms

Objectives:

1. List and discuss safety precautions related to electrical circuits.
2. Define terms related to basic DC electricity.

B. Electron Theory

Objectives:

1. Identify and label parts of an atom.
2. Describe electron flow.
3. Identify hazards and methods used to compensate for static electricity.
4. List the five basic units of electrical measurement.

C. Electrical Laws and Analysis

Objectives:

1. **§ Use Ohm's Law to determine the relationship between voltage, current, and resistance. (Level 3) (App. B. a.4) (GEN-056)**
2. Discuss the principle of Kirchhoff's voltage law.
3. Discuss the principle of Kirchhoff's current law.
4. List and describe the six sources of electrical energy.
5. Discuss the four physical characteristics that affect conductor resistance.
6. Identify types of resistors.
7. Determine resistor values using color codes.

D. Basic Electrical Circuits and Schematics

Objectives:

1. List and discuss the three basic elements of a simple circuit.
2. **§ Identify basic DC electrical symbols and components. (Level 3) (App. B. a.5) (GEN-057)**
3. Discuss the characteristics of series circuits.
4. **§ Analyze a series circuit diagram and calculate problems using Ohm's and Kirchhoff's laws. (Level 3) (App. B. a. 3,4) (GEN-058)**
5. Discuss the characteristics of parallel circuits.
6. **§ Analyze a parallel circuit diagram and calculate problems using Ohm's and Kirchhoff's laws. (Level 3) (App. B. a. 3,4) (GEN-059)**
7. Identify and discuss simple and complex Series-parallel circuits.
8. **§ Analyze a complex series-parallel circuit and calculate problems using Ohm's and Kirchhoff's laws (Level 3) (App. B. a.3,4)(GEN-060)**
9. Discuss characteristics of bridge circuits.
10. Identify and discuss latching relays.
11. **§ Construct DC circuits from schematic diagrams. (Level 3) (App. B. a. 5) (GEN-061)**

COURSE TOPICS (continued)

Note: § Denotes required project

E. Magnetism

Objectives:

1. Define magnetism and describe lines of force.
2. Identify types of magnets.
3. Discuss properties of electromagnets.

F. Electrical Meters

Objectives:

1. Discuss magnetism as it relates to meter movements.
2. Identify types of meter movements.
3. Describe the construction and operation of a multi-meter.
4. **§ Use a multi-meter to perform series, parallel, and complex circuit analysis. (Level 3) (App. B. a.3,4) (GEN-062)**
5. Discuss troubleshooting of basic circuits
6. **§ Troubleshoot a DC circuit using schematic diagrams and a multi-meter. (Level 3)(App. B. a. 3,5) (GEN-063)**

G. Unit Test

II. AIRCRAFT BATTERY SERVICE AND INSPECTION

20

A. Safety and Terms

Objectives:

1. List and follow safety precautions for working with aircraft batteries.
2. Define terms related to aircraft batteries.

B. Battery Classifications

Objectives:

1. Discuss battery types and classifications.
2. Explain the construction and electrical characteristics of a primary cell.

C. Lead Acid Batteries

Objectives:

1. Explain the construction and electrical characteristics of a lead acid battery.
2. Discuss methods used to determine state of charge and cell condition
3. Describe battery compartment maintenance.
4. **§ Remove and install a battery. (Level 3) (App. B. a. 6) (GEN-064)**
5. Compare charging methods.
6. Discuss the relationship between battery state of charge and freezing temperature of electrolyte.

D. Inspect and Service a Lead Acid Battery

CONTACT HOURS
PER TOPIC

COURSE TOPICS (continued)

Note: § Denotes required project**Objectives:**

1. Review shop safety practices.
2. Discuss types of chargers.
3. **§ Inspect and service a lead acid battery. (Level 3) (App. B. a. 6) (GEN-065)**

E. Nickel-Cadmium Battery

Objectives:

1. Explain the construction and electrical characteristics of a nickel-cadmium battery.
2. Discuss methods used to determine state of charge and cell condition.
3. Describe battery compartment maintenance
4. Discuss proper battery installation.
5. Compare charging methods.
6. List advantages and disadvantages of Ni-CAD versus lead-acid batteries.

F. Inspect and Service a Nickel-Cadmium Battery

Objectives:

1. Review shop safety practices.
2. Discuss types of chargers.
3. Discuss service cycle and deep cycle requirements.
4. **§ Inspect and service a nickel-cadmium battery. (Level 3) (App. B. a. 6) (GEN-066)**

G. Unit Test

III. AC ELECTRICAL CIRCUITS

35

A. Safety and Terms

Objectives:

1. List and practice safety precautions related to electrical circuits.
2. Define terms related to AC electricity.
3. Discuss the different types of AC circuits
4. **§ Identify basic AC electrical symbols. (Level 3) (App. B. a. 5) (GEN-067)**

B. Values

Objectives:

1. Discuss the relationship between AC values.
2. Label AC values.

C. Oscilloscopes

Objectives:

1. Discuss the principles and operation of an oscilloscope.

CONTACT HOURS
PER TOPIC

COURSE TOPICS (continued)

Note: § Denotes required project

2. Describe the construction of an oscilloscope.
3. Demonstrate use of an oscilloscope.

D. Resistive AC Circuits

Objectives:

1. **§ Calculate values in an AC resistive circuit. (Level 3) (App. B, a, 4, 5) (GEN-068)**
2. **§ Determine power in an AC resistive circuit. (Level 3) (App. B. a. 2, 3, 4, 5) (GEN-069)**

E. Transformers

Objectives:

1. Discuss mutual inductance.
2. Determine relationships between turns, ratio, voltage ratio, and current ratio.
3. Calculate primary and secondary values.
4. Discuss the three types of power loss.

F. Inductive AC Circuits

Objectives:

1. **§ Differentiate between inductance, reactance, and inductive reactance in an inductive AC circuit. (Level 2) (App. B. a. 1) (GEN-070)**
2. **§ Calculate values in an AC inductive circuit. (Level 2) (App. B. a. 1, 2) (GEN-071)**
3. **§ Analyze an AC inductive circuit. (Level 3) (App. B. a. 1, 5) (GEN-072)**
4. Define phase relationships between voltage and current in an AC inductive circuit.

G. Capacitive AC Circuits

Objectives:

1. **§ Compare capacitance and capacitive reactance in a capacitive circuit. (Level 2) (App. B, a, 1) (GEN-073)**
2. **§ Calculate values in an AC capacitive circuit. (Level 2) (App. B. a. 1, 2, 5) (GEN-074)**
3. **§ Analyze an AC capacitive circuit. (Level 2) (App. B. a. 1, 5) (GEN-075)**
4. Define the phase relationship between voltage and current in an AC capacitive circuit.

H. Resistive Inductive (RL) Circuits

Objectives:

1. Discuss the interrelationship of resistance and inductive reactance.
2. Define impedance.
3. **§ Calculate all values in an RL circuit. (Level 3) (App. B. a. 1, 2, 5) (GEN-076)**
4. **§ Analyze an RL circuit. (Level 3) (App. B. a. 1, 3, 5) (GEN-077)**

I. Resistive Capacitive (RC) Circuits

Objectives:

CONTACT HOURS
PER TOPIC

COURSE TOPICS (continued)

Note: § Denotes required project

1. Discuss the interrelationship of resistance and capacitive reactance.
2. **§ Calculate all values in an RC circuit. (Level 3) (App. B. a. 1,2,5) (GEN-078)**
3. **§ Analyze an RC circuit (Level 2) (App. B. a. 1,3,5) (GEN-079)**

J. Resistive, Inductive, Capacitive (RLC) Circuits

Objectives:

1. Discuss the interrelationship of resistance, inductive and capacitive reactance.
2. **§ Calculate all values in an RLC circuit. (Level 3) (App. B. a. 1,5) (GEN-080)**
3. **§ Analyze an RLC circuit. (Level 2) (App. B. a. 1) (GEN-081)**

K. Unit Test

IV. SOLID STATE CIRCUITS

25

A. Safety and Terms

Objectives:

1. List and practice safety precautions related to solid-state.
2. List and practice safety precautions to be used when soldering.
3. Define terms related to solid-state.
4. **§ Identify solid-state symbols. (Level 3) (App. B. a. 5) (GEN-082)**

B. Vacuum Tubes

Objectives:

1. Discuss vacuum tube construction.
2. Identify types of vacuum tubes.

C. Semi-Conductors

Objectives:

1. Discuss semi-conductor construction.
2. Identify types of semi-conductors and their operation.

D. Digital Logic

Objectives:

1. Discuss digital logic symbols and definitions.
2. **§ Identify digital logic circuits. (Level 3) (App. B. a. 5) (GEN-083)**
3. Discuss digital logic circuits.

E. Magneto Timing Light

Objectives:

1. Inventory magneto timing light component parts.

COURSE TOPICS (continued)

Note: § Denotes required project

CONTACT HOURS
PER TOPIC

2. Perform operational check.
3. **§ Construct circuits using solid-state components. (Level 3) (App. B. a. 5) (GEN-084)**

F. Indicating and Arming Circuits

Objectives:

1. Explain latching circuits.
2. Discuss proximity switches.
3. Explain the use of SCR.
4. Discuss Flip-Flop circuits.

G. Static Protection

Objectives:

1. Demonstrate precautions required to prevent static damage.

H. Unit Test

V. GENERAL III REMEDIATION, REVIEW, AND TESTING

5

General Block III Final Exam

PROGRAM TITLE: Aviation Maintenance Management

COURSE TITLE: Aviation Maintenance Technology General III

CIP NUMBER: 1649.010401

LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S): TITLES(S):

- 01.0 PERFORM BASIC ELECTRICITY SKILLS--The student will be able to:
- 01.01 Calculate and measure capacitance and inductance. [FAA FAR Part 147, Level 2]
 - 01.02 Calculate and measure electrical power. [FAA FAR Part 147, Level 2]
 - 01.03 Measure voltage, current, resistance, and continuity. [FAA FAR Part 147, Level 3]
 - 01.04 Determine the relationship of voltage, current, and resistance in electrical circuits. [FAA FAR Part 147, Level 3]
 - 01.05 Read and interpret aircraft electrical-circuit diagrams, including solid-state devices and logic functions. [FAA FAR Part 147, [Level 3]
 - 01.06 Inspect and service batteries. [FAA FAR Part 147, Level 3]
 - 01.07 Utilize proper electrical safety procedures.



NOTE: Use either the Tab key or mouse click to move from field to field. The box will expand to accommodate your entry.

<i>Section 1</i> COURSE PREFIX AND NUMBER: AMT 1753	SEMESTER CREDIT HOURS: 3
COURSE TITLE: Aviation Maintenance Technology General 3	

Section 2
 TYPE OF COURSE: (Click on the box to check all that apply)

<input type="checkbox"/> AA Elective	<input checked="" type="checkbox"/> AS Required Professional Course	<input type="checkbox"/> College Prep
<input type="checkbox"/> AS Professional Elective	<input checked="" type="checkbox"/> AAS Required Professional Course	<input type="checkbox"/> Technical Certificate
<input type="checkbox"/> Other _____		
<input type="checkbox"/> General Education: (For General Education courses, you must also complete Section 3 and Section 7)		

Section 3 (If applicable)
 INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES:

<input type="checkbox"/> Communication	<input type="checkbox"/> Social & Behavioral Sciences	<input type="checkbox"/> Mathematics
<input type="checkbox"/> Natural Sciences	<input type="checkbox"/> Humanities	

Section 4
 INTELLECTUAL COMPETENCIES:

<input checked="" type="checkbox"/> Reading	<input type="checkbox"/> Speaking	<input type="checkbox"/> Critical Analysis	<input checked="" type="checkbox"/> Quantitative Skills	<input type="checkbox"/> Scientific Method of Inquiry
<input type="checkbox"/> Writing	<input checked="" type="checkbox"/> Listening	<input type="checkbox"/> Information Literacy	<input type="checkbox"/> Ethical Judgment	<input checked="" type="checkbox"/> Working Collaboratively

<i>Section 5</i> LEARNING OUTCOMES	METHOD OF ASSESSMENT
• Understand the relationship between voltage, current and resistance	Written test created from FAA Test Bank of Questions
• Service Lead-Acid and Nickel-Cadmium batteries	Practical test based on FAA Practical Test Standards
• Demonstrate use of oscilloscope in AC circuits	Practical test based on FAA Practical Test Standards
• Construct circuits using solid-state components	Practical test based on FAA Practical Test Standards
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Section 6
 Name of Person Completing This Form: **Richard Rozanski**