FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: AMT 1762

COURSE TITLE: Aviation Maintenance Technology Airframe II

PREREQUISITE(S): None

COREQUISITE(S): None

STUDENT ADVISING NOTES: Completion of General I through IV

CREDIT HOURS: 6

CONTACT HOURS/WEEK: 16

CONTACT HOUR BREAKDOWN:
- Lecture/Discussion: 8
- Laboratory: 8
- Other lecture/lab combination:

FACULTY WORKLOAD POINTS: 8

STANDARDIZED CLASS SIZE ALLOCATION: 25 (FAA Limited)

COURSE DESCRIPTION: This course is designed to introduce skills and the necessary knowledge and understanding of aircraft finishes and fabric covering, assembly and repair of sheet metal structures, and introduction to aircraft welding techniques.

SUGGESTED TEXT(S):

TITLE	NUMBER
Jeppesen A&P Technician Airframe Textbook	ISBN # 0-88487-205-1
Jeppesen A&P Technician Airframe Workbook	ISBN # 0-88487-295-5
Jeppesen A&P Technician Airframe Test Guide	ISBN # 0-88487-297-1
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. AIRCRAFT FINISHES AND FABRIC COVERING 50

A. Introduction to Fabric Covering

Objectives:
1. Describe safety practices and procedures related to aircraft finishing and fabric covering.
2. Define terms related to fabric covering.
3. List and describe FAA rules and regulations relating to aircraft fabric covering.

B. Natural Fabrics

Objectives:
1. List and discuss types of natural fabrics.
2. Identify characteristics of natural fabrics.
3. Discuss grades of natural fabrics.
4. Explain methods of shrinkage of natural fabrics. (Level 1) (App. C.I, b.4)

C. Synthetic Fabrics

Objectives:
1. List types of manmade fabrics.
2. Give advantages of manmade over natural fibers. (Level 1) (App. C.I, b.4)
3. Discuss usage and applications of fiberglass cloth. (Level 1) (App. C.I, b.4)

D. Fabric Airworthiness Testing

Objectives:
1. Discuss test procedures involved for FAA certification of fabric. (Level 1) (App. C.I, b.5)
2. Demonstrate a fabric test on sample panel. (Level 1) (App. C.I, b. 5)

E. Preparation, Procedures and Limitations of Fabric Covering

Objectives:
1. Explain inspection techniques before covering.
2. Observe a fabric covering process using the blanket or envelope method. (Level 1) (App C.I, b. 4)
3. Identify types of seams and their placement. (Level 1) (App. C.I, b.4)

F. Dope and Finish Applications

Objectives:
1. List and define terms used in finish or dope applications.
2. Discuss anti tear strips.
3. Describe usages of reinforcing tape.
4. Discuss usages of rib lacing cord.
5. List applications for wire clips and screws.

COURSE TOPICS (continued) CONTACT HOURS PER TOPIC

Note: § Denotes required project

G. Doped Repairs

Objectives:

1. Discuss procedures for a doped on patch repair. (Level 1) (App. C.I, b. 5)
2. Discuss procedures for an L-shaped repair. (Level 1) (App. C.I, b. 5)
3. **§ Apply fabric and perform a doped on patch repair. (Level 2) (App. C.I, b.5) (AF1-001)**

H. Finishes

Objectives:

1. Discuss various methods used to rejuvenate old finishes.
2. **§ Identify and select primers and finishes used on aircraft. (Level 2)(App C.I, c. 7) (AF1-002)**
3. Describe types of topcoats.
4. Discuss the application of non-fabric finishes and paints. (Level 1) (App. C.I, c.6)
5. Describe spray equipment applications.
6. Discuss spray gun design and operation.
7. **§ Disassemble, clean, inspect and overhaul a paint gun. (Level 2) (App C.I, c. 7,8) (AF1-003)**
8. Discuss paint stripping.
9. **§ Finish and inspect a surface. (Level 3) (App C.I, c, 7,8,9) (AF1-004)**

I. Legal Registration

Objectives:

1. Discuss legal aspects of registration lettering as required by FAR part 45.
2. Describe the design and installation of registration letters and numbers. (Level 1) (App. C.I, c.6)
3. **§ Lay-out, mask-off and apply a registration letter or number.(Level 3)(App. C.I, c. 6,7,8,9) (AF1-005)**

J. Unit Test

II. SHEET METAL STRUCTURES, ASSEMBLY AND REPAIR 120

A. Safety

Objectives:

1. Discuss safety precautions for working with sheet metal
2. Discuss protective equipment used

B. Airframe Materials (Metals)

Objectives:

1. Discuss types of materials used.
2. Discuss alloying elements for aluminum.
3. Discuss alloying elements of steel
4. Discuss advantages and disadvantages of aluminum.

CONTACT HOURS
COURSE TOPICS (continued) PER TOPIC

Note: § Denotes required project

5. Discuss advantages and disadvantages of magnesium.
6. Interpret sheet stock nomenclature.
7. Interpret sheet stock composition.
8. Discuss aluminum strength characteristics, advantages and disadvantages.
9. Discuss heat treatable and non-heat treatable aluminum.
10. Identify the code designations for heat treatable alloys.

C. Sheet Metal Structural Loading

Objectives:

1. Identify primary and secondary structural parts.
2. Identify non-structural parts.
3. Identify loads and stresses acting on aircraft structures.
4. Explain how to determine condition of stressed skin structure that is known to have been critically loaded.

D. Riveting Tools and Techniques

Objectives:

1. Define terms related to sheet metal structures, fasteners, materials and repair equipment.
2. Identify parts and sizes of rivet guns.
3. Demonstrate care and maintenance of rivet gun.
4. Discuss care and maintenance of drill motor.
5. Discuss proper drilling techniques and precautions.
6. Demonstrate usage of pneumatic rivet guns and drill motors.

E. Rivets

Objectives:

1. Dimension solid shank rivets.
2. Discuss proper drill bit sizes for specific hole size.
3. Discuss hole preparation.
4. Discuss countersinking and dimpling procedures.
5. Discuss problems encountered in riveting and drilling.
6. Discuss removal of rivets
7. Identify head style and part numbers of rivets.
8. Explain rivet coding system.
9. Discuss rivet composition and materials.
10. Explain icebox rivets and describe temperature and time.
11. Discuss stresses that rivets are designed to resist.
12. Determine shear strength, bearing strength, bearing failure and shear failure.
13. **§ Determine proper rivet length and diameters. (Level 3) (App. C.I, d. 15) (AF1-015)**
14. **§ Determine cleco sizes and colors to be used with rivet sizes and diameters. (Level 2) (App. C.I, d.10) (AF1-016)**
15. Explain precautions concerning rivet fit.

CONTACT HOURS
COURSE TOPICS (continued) PER TOPIC

Note: § Denotes required project

F. Rivet Layout

Objectives:

1. Explain edge distance
2. Explain spacing and transverse pitch.
3. Explain general repair procedure for elongated rivet holes.
4. Discuss corrosion prevention methods for rivets.
5. **§ Prepare and layout sheet metal, install and remove conventional protruding head and flush type solid rivets. (Level 3) (App. C.I, d.15) (AF1-017)**

G. Sheet metal fabrication and equipment

Objectives:

1. Discuss the specific safety precautions for sheet metal fabrication equipment
2. Identify special tools and equipment used in sheet metal fabrication
3. Discuss proper use of shop equipment used in sheet metal fabrication.
4. Demonstrate proper use of shop equipment used in forming sheet metal.
5. Discuss hand forming of sheet metal.
6. **§ Fabricate a former and add lightning holes. (Level 3) (App. C.I, d.16) (AF1-018)**

H. Layout and Bending of Flat Sheet Stock

Objectives:

1. Discuss layout tools and their uses
2. Define bend radius.
3. Discuss checking radius sizes.
4. Discuss factors determining radius sizes.
5. Define parts of a bend.
6. Introduce formulas for finding bend allowance.
7. Explain set back and its use.
8. Explain sight line.
9. Explain layout for bends other than 90 degrees.
10. Discuss formation of a joggle.
11. Explain layout of metal across verses along the grain.
12. Explain purpose and location of bend relief holes.
13. **§ Form, lay out, and bend sheet metal. (Level 3) (App. C.I, d.16) (AF1-019)**
14. **§ Construct a sheet metal structure using proper layout, bending, forming and riveting techniques. (Level 3) (App. C.I, d. 15,16) (AF1-020)**
15. **§ Fabricate a joggle. (Level 3) (App. C.I, d.16) (AF1-021)**

I. Sheet Metal Repairs

Objectives:

1. Discuss damage classifications
2. Identify the basic requirement for all structural repairs.
3. Discuss the process for determining the proper repair

COURSE TOPICS (continued) CONTACT HOURS PER TOPIC

Note: § Denotes required project

4. Explain the difference between a major and a minor repair.
5. Discuss repair by patching and repair by insertion
6. Discuss types of skin patches.
7. Discuss crack repairs by stop drilling.
8. Discuss stringer repairs.
9. **§ Inspect and repair a damaged skin using a flush and lap type repair. (Level 3) (App. C.I, d.14,15) (AF1-022)**

J. Unconventional Fasteners

Objectives:

1. Identify blind rivets.
2. Identify rivnuts.
3. Discuss huck bolts
4. Discuss Hi-Lok fasteners.
5. Discuss Jo-bolts.
6. Discuss lock-bolts
7. **§ Inspect and repair a damaged stringer using conventional and unconventional fasteners. (Level 3) (App. C.I, d.14,15) (AF1-023)**
8. **§ Fabricate a sheet metal box and install rivnuts. (Level 3) (App. C.I, d. 10,15,16)(AF1-024)**

K. Unit Test

III. INTRODUCTION TO AIRCRAFT WELDING 25

A. Fundamentals and Introduction

Objectives:

1. Describe safety practices and procedures for handling high pressure welding gasses.
2. Define terms related to welding.
3. List types of welding used on aircraft.

B. Material Selection

Objectives:

1. List factors that determine the selection of steel to use for welding.
2. List factors that determine the selection of aluminum. (Level 1) (App. C.I, e. 21)
3. List factors that determine the selection of stainless. (Level 1) (App. C.I, e. 21)

C. Oxyacetylene Welding

Objectives:

1. Identify various parts of the welding rig and give the purpose of each.
2. Discuss the design and care of torch tips.
3. Describe the design and construction of the cylinders.

CONTACT HOURS
COURSE TOPICS (continued) PER TOPIC

Note: § Denotes required project

4. Give the function or purpose of regulators, hoses and fittings, rods, and flame adjustments.
5. Discuss safety procedures for oxy acetylene welding.
6. **§ Set up, turn on, adjust torch to neutral flame, gas weld steel and shutdown oxyacetylene welding equipment. (Level 2) (App. C.I, e. 20) (AF1-033)**
7. **§ Set up, turn on, adjust torch to neutral flame, silver-solder/braze steel and shutdown oxyacetylene welding equipment. (Level 2) (App. C.I, e. 20) (AF1-034)**

D. Arc Welding

Objectives:

1. Discuss the procedure for shielded metal arc welding.(SMAW)
2. Discuss characteristics and usage of gas tungsten arc welding (GTAW).
3. Discuss characteristics of gas metal arc welding (GMAW).
4. Discuss safety procedures for arc welding processes.
5. **§ Set up, turn on, adjust machine, arc weld low carbon steel, stainless steel and aluminum using the appropriate welding techniques. (Level 2) (App. C.I, e. 20,21) (AF1-035)**

E. Special Joining Techniques

Objectives:

1. Discuss procedures used for brazing.
2. Describe characteristics and usage of hard soldering including stainless steel. (Level 1) (App C,I,E,18)
3. Describe characteristics and usage of soft soldering. (Level 1) (App. C.I, e.18)
4. Discuss peculiarities of welding magnesium. (Level 1) (App. C.I, e.17)
5. Discuss peculiarities of welding titanium. (Level 1) (App. C.I, e. 17)
6. Discuss peculiarities of welding aluminum. (Level 1) (App. C.I, e. 21)
7. Discuss peculiarities of welding stainless steel. (Level 1) (App. C.I, e. 21)

F. Welding Inspection

Objectives:

1. Discuss factors that determine fusion weld quality.
2. **§ Inspect the condition of completed welds. (Level 2) (App. C.I, e. 20) (AF1-036)**
3. **§ Explain procedure and perform visual inspection of tubular welds.(Level 2)(App.C.I,e.19) (AF1-037)**

G. Repair and Fabrication

Objectives:

1. Discuss procedures used to produce a bead on flat plate without rod.
2. Discuss procedures used to produce a bead on flat plate with rod.
3. Discuss procedures used to weld a butt joint on flat plate. Discuss procedures used to weld a lap joint.
4. Discuss procedures used to weld a tee joint.
5. Identify tubular repairs: fish mouth, scarf, rosettes, and dented bay. (Level 1) (App. C.I, e.19)

H. Unit Test

COURSE TOPICS (continued) **Note: § Denotes required project**	CONTACT HOURS PER TOPIC
IV. AIRFRAME II REMEDIATION, REVIEW, AND TESTING	45
Airframe Block II Final Exam	

PROGRAM TITLE: Aviation Maintenance Management

COURSE TITLE: Aviation Maintenance Technology Airframe II

CIP NUMBER: 1649.010401

LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S): TITLES(S):

19.0 PERFORM AIRCRAFT COVERING--The student will be able to:
- 19.01 Select and apply fabric and fiberglass covering materials. [FAA FAR Part 147, Level 1]
- 19.02 Inspect, test, and repair fabric and fiberglass. [FAA FAR Part 147, Level 1]

20.0 APPLY AIRCRAFT FINISHES--The student will be able to:
- 20.01 Apply trim, letters, and touch-up paint. [FAA FAR Part 147, Level 1]
- 20.02 Identify and select aircraft finishing materials. [FAA FAR Part 147, Level 2]
- 20.03 Apply finishing materials. [FAA FAR Part 147, Level 2]
- 20.04 Inspect finishes and identify defects. [FAA FAR Part 147, Level 2]

21.0 REPAIR SHEET-METAL STRUCTURES--The student will be able to:
- 21.01 Select, install, and remove special fasteners for metallic, bonded, and composite structures. [FAA FAR Part 147, Level 2]
- 21.02 Inspect bonded structures. [FAA FAR Part 147, Level 2]
- 21.03 Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures. [FAA FAR Part 147, Level 2]
- 21.04 Inspect, check, service, and repair windows, doors, and interior furnishings. [FAA FAR Part 147, Level 2]
- 21.05 Inspect and repair sheet-metal structures. [FAA FAR Part 147, Level 3]
- 21.06 Install conventional rivets. [FAA FAR Part 147, Level 3]
- 21.07 Form, lay out, and bend sheet metal. [FAA FAR Part 147, Level 3]
- 21.08 Identify and utilize appropriate metalworking tools and equipment.

22.0 PERFORM WELDING--The student will be able to:
- 22.01 Weld magnesium and titanium. [FAA FAR Part 147, Level 1]
- 22.02 Solder stainless steel. [FAA FAR Part 147, Level 1]
- 22.03 Fabricate tubular structures. [FAA FAR Part 147, Level 1]
- 22.04 Solder, braze, gas-weld, and arc-weld steel. [FAA FAR Part 147, Level 2]
- 22.05 Weld aluminum and stainless steel. [FAA FAR Part 147, Level 1]
- 22.06 Identify and utilize appropriate welding tools and equipment.

Florida State College
At Jacksonville

Course Learning Outcomes & Assessment For All College Credit Courses

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

Section 1	
COURSE PREFIX AND NUMBER: **AMT 1762**	SEMESTER CREDIT HOURS: **6**
COURSE TITLE: **Aviation Maintenance Technology Airframe 2**	

Section 2

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

- ☐ **AA Elective**
- X **AS Required Professional Course**
- ☐ **College Prep**
- ☐ **AS Professional Elective**
- X **AAS Required Professional Course**
- ☐ **Technical Certificate**
- ☐ **Other** _____
- ☐ **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:

- ☐ **Communication**
- ☐ **Social & Behavioral Sciences**
- ☐ **Mathematics**
- ☐ **Natural Sciences**
- ☐ **Humanities**

Section 4

INTELLECTUAL COMPETENCIES:

- X **Reading**
- ☐ **Speaking**
- ☐ **Critical Analysis**
- ☐ **Quantitative Skills**
- ☐ **Scientific Method of Inquiry**
- X **Writing**
- X **Listening**
- ☐ **Information Literacy**
- ☐ **Ethical Judgment**
- X **Working Collaboratively**

Section 5

	LEARNING OUTCOMES	METHOD OF ASSESSMENT
•	Apply and repair aircraft fabric	Practical test based on FAA Practical Test Standards
•	Mix and apply aircraft paint finish	Practical test based on FAA Practical Test Standards
•	Select and install aircraft sheet metal fasteners	Practical test based on FAA Practical Test Standards
•	Fabricate and repair sheet metal structures	Practical test based on FAA Practical Test Standards
•	Arc weld steel materials	Practical test based on FAA Practical Test Standards
•	Braze materials using oxygen-acetylene welding equipment	Practical test based on FAA Practical Test Standards
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Section 6

Name of Person Completing This Form: Richard Rozanski