

## FLORIDA STATE COLLEGE AT JACKSONVILLE

## NON-COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: AMT 0824

COURSE TITLE: Aviation Maintenance Technology Powerplant IV

PREREQUISITE(S): None

COREQUISITE(S): None

STUDENT ADVISING NOTES: Completion of *General I* through *IV*

TOTAL CONTACT HOURS: 240  
(For Office Use Only:  
Vocational Credits 8.0)

FACULTY WORKLOAD POINTS: 8.0

STANDARDIZED CLASS SIZE  
ALLOCATION: 25

## COURSE DESCRIPTION:

This course is designed to introduce skills and the necessary knowledge and understanding of aircraft turbine engine overhaul; turbine engine removal, installation and operation; turbine engine inspection, troubleshooting and maintenance.

## SUGGESTED TEXT(S):

Jeppesen A&P Technician Powerplant Textbook ISBN # 0-88487-207-6  
Jeppesen A&P Technician Powerplant Workbook ISBN # 0-88487-243-2  
Jeppesen A&P Technician Powerplant Test Guide ISBN # 0-88487-310-2  
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  
CLOA added 2009 (20092)

| COURSE TOPICS   | CONTACT HOURS<br><u>PER TOPIC</u> |
|---|-----------------------------------|
| <b>Note: § Denotes required project</b>   |                                   |
| I. TURBINE ENGINE REMOVAL, OVERHAUL, INSTALLATION, AND OPERATION  | 145                               |
| A. Turbine Engine Removal   |                                   |
| Objectives:   |                                   |
| 1. Select terms and definitions associated with turbine engine removal.   |                                   |
| 2. Discuss safety practices associated with turbine engine removal.   |                                   |
| 3. Discuss specific aircraft procedures related to engine removal.  |                                   |
| 4. <b>§ Remove engine from aircraft using technical manual for the aircraft. (Level 3) (App. D.I, b. 7) (PP2-017)</b>   |                                   |
| B. Introduction to Turbine Engine Overhaul  |                                   |
| <b>Objectives:</b>  |                                   |
| 1. Define terms related to turbine engine overhaul.   |                                   |
| 2. Discuss turbine engine construction and nomenclature.  |                                   |
| 3. List types of turbine maintenance and maintenance programs.  |                                   |
| 4. Identify appropriate fluids used in the various turbine engines.   |                                   |
| 5. Discuss safety precautions related to servicing turbine fluids.  |                                   |
| 6. List and describe cleaning procedures for turbine engine components.   |                                   |
| 7. Discuss the purpose and operation of an oil cooler.  |                                   |
| 8. Discuss inspection, servicing, and troubleshooting turbine engine pneumatic starting systems. (Level 1) (App. D.II, e.19b)   |                                   |
| C. Disassembly of Sections  |                                   |
| <b>Objectives:</b>  |                                   |
| 1. Explain the procedure used to disassemble the accessory section.   |                                   |
| 2. Discuss disassembly of the compressor section.   |                                   |
| 3. <b>§ Use manufacturer's overhaul manual to disassemble the compressor section. (Level 2) (App. D.I, b.5) (PP2-018)</b>   |                                   |
| 4. Describe disassembly procedure for combustor section.  |                                   |
| 5. <b>§ Use manufacturer's overhaul manual to disassemble the combustion section. (Level 2) (App. D.I, b. 5) (PP2-019)</b>  |                                   |
| 6. Discuss disassembly of the turbine section.  |                                   |
| 7. <b>§ Use manufacturer's overhaul manual to disassemble turbine section. (Level 2) (App. D.I, b. 5) (PP2-020)</b>   |                                   |
| 8. Explain the procedure used to disassemble an exhaust section.  |                                   |
| 9. <b>§ Use manufacturer's overhaul manual to disassemble an exhaust section. (Level 2) (App. D.I, b. 5) (PP2-021)</b>  |                                   |
| D. Inspection and Repair  |                                   |
| <b>Objectives:</b>  |                                   |
| 1. Discuss the inspection of bearings and seals.  |                                   |
| 2. <b>§ Visually inspect bearings and seals. (Level 3) (App. D.I, b. 5,6) (PP2-022)</b>   |                                   |
| 3. <b>§ Clean and inspect all section components for wear or defects, and enter defective parts on a materials list. (Level 3) (App. D.I, b. 5,6) (PP2-023)</b>                   |                                   |
| 4. <b>§ Perform necessary repairs to all section components in accordance with manufacturer's overhaul manuals. (Level 3) (App. D.I, b. 5,6) (App. D.II, j. 31,32a) (PP2-024)</b> |                                   |

5. § Perform dye penetrant inspection. (Level 3) (App. D. I, b. 5,6) (PP2-025)
6. § Check and inspect lube oil filter element. (Level 3) (App. D.I, d. 15,16) (PP2-026)

#### E. Reassembly

##### Objectives:

1. § Use manufacturer's overhaul manuals to reassemble combustor, turbine, and exhaust sections. (Level 2) (App. D.I, b,5) (PP2-027)
2. § Use manufacturer's overhaul manuals to reassemble compressor, and accessory sections. (Level 2) (App. D.I, b. 5) (PP2-028)
3. § Perform final assembly of engine -- including exterior lines, components, and attaching hardware. (Level 2) (App. D.I, b. 5) (PP2-029)

#### F. Engine Preparation for Installation

##### Objectives:

1. Discuss procedures used to prepare engine for installation.
2. § Install and rig engine. (Level 3) (App. D.I, b. 7) (PP2-030)

#### G. Engine Operation

##### Objectives:

1. Discuss terms and practices associated with turbine engine operation.
2. Discuss safety terms and practices associated with turbine engine operation
3. § Perform turbine engine run-up and systems check. (Level 3)(App. D.I, b. 6,7)(App. D.II, e. 19a) (PP2-031)

#### H. Unit Test

## II. TURBINE ENGINE INSPECTION, TROUBLESHOOTING, AND MAINTENANCE 40

### A. Introduction to Turbine Engine Inspection

##### Objectives:

1. Discuss terms and definitions related to turbine engine inspection.
2. Discuss engine conformity and Airworthiness Directive compliance inspections.
3. § Perform conformity and Airworthiness Directive compliance inspections.(Level 3) (App. D. I., c 8) (PP2-032)
4. § Write log book entry to indicate A.D. compliance. (Level 3)(App. D. I. c 8) (PP2-033)
5. Discuss inspection and troubleshooting unducted fan systems and components. (Level 1) (App. D.II, l. 40)

### B. Introduction to Turbine Engine Maintenance

##### Objectives:

1. Discuss terms and practices related to turbine engine maintenance.
2. Describe terms, methods, practices and types of maintenance programs.
3. § Test an ignition lead. (Level 3) (App. D.II, e. 18) (PP2-034)
4. § Remove, clean, inspect and install igniter plug. (Level 3) (App. D.II, e.18) (PP2-035)
5. § Adjust output pressure of engine fuel pump. (Level 3) (App. D.I, b.6; D.II, f 20; g. 25) (PP2-036)
6. § Adjust output pressure of oil relief valve. (Level 3) (App. D.I, b. 6; D.II, d. 16) (PP2-037)
7. Discuss inspection, checks, servicing, and troubleshooting turbine driven auxiliary power units. (Level 1) (App. D.II, m. 41)

### C. Terms and Procedures Used in Troubleshooting

##### Objectives:

1. § Troubleshoot turbine engine system malfunctions. (Level 3) (App. D.I, b.7) (PP2-038)

2. **§ Check for electrical malfunctions using a multimeter (Level 3) (App. D.II, c.13) (PP2-039)**
3. List possible source or cause of metallic particles in the lubricating oil.
4. Discuss causes of fuel pressure fluctuation.
5. Describe sources of fuel system contamination.

D. Unit Test

**III. ENTREPRENEURSHIP OPPORTUNITIES FOR POWERPLANT  
MAINTENANCE TECHNICIAN**

**25**

A. Small Business in Our Society

1. Opportunities
2. Entrepreneurs
3. Rate of Failure
4. Reason for Failures

B. Forms Of and Personal Requirements of Business Organizations

1. Sole Proprietorship
2. Partnership
3. Corporation
  - a. Regular
  - b. Subchapter-S
4. Advantages and Disadvantages of Each

C. Franchises

1. Definition
2. Types
3. Trends

D. Startup Vs. Buying A Business

1. Advantages of Startup
2. Advantages of Buying Existing Business

E. Developing a Business Plan

1. Need for Planning
2. Steps
3. The Plan Itself

**IV. POWERPLANT IV REMEDIATION, REVIEW, AND TESTING**

**30**

PROGRAM TITLE: AIRCRAFT POWERPLANT MECHANICS  
COURSE TITLE: Aviation Maintenance Technology Powerplant III  
CIP NUMBER: 0647060700

LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S): TITLES(S):

- 19.0 PERFORM BASIC TURBINE ENGINE SKILLS--The student will be able to:
- 19.01 Overhaul a turbine engine. [FAA FAR Part 147, Level 2]
  - 19.02 Inspect, check, service, and repair turbine engines and turbine engine installations. [FAA FAR Part 147, Level 3]
  - 19.03 Install, troubleshoot, and remove turbine engines. [FAA FAR Part 147, Level 3]
  - 19.04 Inspect and troubleshoot unducted fan systems and components. [FAA FAR Part 147, Level 1]
  - 19.05 Inspect, check, service, and troubleshoot turbine-driven auxiliary power units. [FAA FAR Part 147, Level 1]
- 20.0 PERFORM ENGINE INSPECTION--The student will be able to:
- 20.01 Perform powerplant conformity and airworthiness inspections. [FAA FAR Part 147, Level 3]
- 34.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP RELATED TO OPPORTUNITIES IN AVIATION POWERPLANT MAINTENANCE OCCUPATIONS--The student will be able to:
- 34.01 Define entrepreneurship.
  - 34.02 Describe the importance of entrepreneurship to the aviation maintenance industry.
  - 34.03 List the advantages and disadvantages of aviation maintenance business ownership.
  - 34.04 Identify the risks involved in ownership of an aviation maintenance business.
  - 34.05 Identify the necessary personal characteristics of a successful aviation maintenance business owner.
  - 34.06 Identify the business skills needed to operate an aviation maintenance business efficiently and effectively.



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

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|--|--|
| <i>Section 1</i>   |  |
| COURSE PREFIX AND NUMBER: AMT0824                          | SEMESTER CREDIT HOURS (CC):<br>CONTACT HOURS (NCC): <u>240</u> |
| COURSE TITLE: Aviation Maintenance Technology Powerplant 4 |  |

*Section 2*

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

|   |   |  |
|---|---|--|
| <input type="checkbox"/> AA Elective  | <input type="checkbox"/> AS Required Professional Course  | <input type="checkbox"/> College Prep          |
| <input type="checkbox"/> AS Professional Elective   | <input type="checkbox"/> AAS Required Professional Course | <input type="checkbox"/> Technical Certificate |
| <input type="checkbox"/> Other _____  | <input checked="" type="checkbox"/> PSAV                  | <input type="checkbox"/> Apprenticeship        |
| <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"/> Communications   | <input type="checkbox"/> Social & Behavioral Sciences | <input type="checkbox"/> Mathematics |
| <input type="checkbox"/> Natural Sciences | <input type="checkbox"/> Humanities                   |                                      |

*Section 4*

INTELLECTUAL COMPETENCIES:

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

| <i>Section 5</i>  |  |
|---|--|
| LEARNING OUTCOMES   | METHOD OF ASSESSMENT                                 |
| • Use manufacturer's manuals to overhaul turbine engine.                                | Practical test based on FAA Practical Test Standards |
| • Remove and reinstall turbine engine   | Practical test based on FAA Practical Test Standards |
| • Perform engine conformity inspection  | Practical test based on FAA Practical Test Standards |
| • Troubleshoot turbine engine systems   | Written test created from FAA Test Bank of Questions |
| • Demonstrate and understanding of entrepreneurship as it relates to the AMT profession | Written test   |
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*Section 6*

Name of Person Completing This Form: David W. Dagenais Date: 09-09-2008