

FLORIDA STATE COLLEGE AT JACKSONVILLE
COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: AMT 1772

COURSE TITLE: Aviation Maintenance Technology Powerplant 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 <u>lecture/lab combination</u> :	

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 reciprocating engine overhaul; reciprocating engine removal, installation and operation; and reciprocating 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

SUGGESTED TEXT(S): (Continued)

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 <u>PER TOPIC</u>
Note: § Denotes required project	
I. Reciprocating Engine Removal, Overhaul, Installation, and Operation	145
A. Preliminaries for Engine Removal	
Objectives:	
<ol style="list-style-type: none"> 1. Define terms related to reciprocating engine removal. 2. Discuss conditions that necessitate an engine removal. 3. State the difference between a built-up (QECA) engine and a bare engine. 4. Discuss the major reasons to have QECA engines and/or bare engines. 5. Describe operations related to reciprocating engine removal. 6. Discuss safety procedures related to the removal and installation of engines in aircraft. 7. § Remove a reciprocating engine. (Level 3) (App. D.I, a. 4) (PP1-018) 	
B. Introduction to Reciprocating Engine Overhaul	
Objectives:	
<ol style="list-style-type: none"> 1. Define terms related to reciprocating engine overhaul. 2. Discuss conditions that can necessitate an engine overhaul. 3. Explain how recommended overhaul time is determined. 4. Differentiate between a complete overhaul and a top overhaul. 5. State the difference between an overhauled engine and a rebuilt engine. 6. Discuss how major repairs differ from a major overhaul. 	
C. Overhaul Preliminaries	
Objectives:	
<ol style="list-style-type: none"> 1. Arrange, in order, the basic steps of the engine overhaul process. 2. Discuss usage of engine overhaul tools and equipment. 3. Explain the importance of following procedures listed in manufacturer's overhaul manuals. 4. Discuss what is meant by a certificated repair station. 5. Discuss shop safety procedures utilized when preparing for an overhaul. 	
D. Pre-overhaul Procedures	
Objectives:	
<ol style="list-style-type: none"> 1. § Receive and inspect general condition of engine and accessories. (Level 2) (App.D.I,a.2) (PP1-019) 2. § Record status, make, model, and serial numbers of engine and components. (Level 2) (App. D.I, a. 2) (PP1-020) 3. Explain the importance of organizing engine records. 4. § Use manufacturers' manuals, service instructions and bulletins to identify and mark all parts. (Level 2) (App. D.I, a. 2) (PP1-021) 	

CONTACT HOURS
PER TOPIC

COURSE TOPICS (continued)

Note: § Denotes required project

5. § Perform a preliminary visual inspection and tag defective parts.(Level 2) (App. D.I, a. 2) (PP1-022)
6. § List defective parts for ordering purposes. (Level 2) (App. D.I, a. 2) (PP1-023)

E. Cleaning Procedures

Objectives:

1. List and describe cleaning procedures.
2. Discuss safe and proper use of parts washing machine.
3. Demonstrate safe and proper use of parts washing machine.
4. Discuss why dissimilar metals should not be placed in the solution tank at the same time.
5. Select proper types of blasting materials for various engine parts.
6. Discuss safe and proper use of grit blast machine.
7. Demonstrate safe and proper use of grit blast machine
8. § Disassemble and clean a reciprocating engine. (Level 2) (App. D.I, a. 2, 3) (PP1-024)

F. Structural Inspection

Objectives:

1. Explain the need for a structural inspection and discuss safe use of NDT equipment.
2. Discuss basic nondestructive methods of structural inspections.
3. § Perform nondestructive methods of structural inspection as required by instructor. (Level 2) (App. D.I, a. 3) (PP1-025)

G. Dimensional Inspections

Objectives:

1. Discuss dimensional inspections and wear characteristics of engine components.
2. § Use precision measuring instruments to check tolerances. (Level 2) (App. D.I, a. 2) (PP1-026)
3. § Perform dimensional inspection to check for wear. (Level 2) (App. D.I, a. 2) (PP1-027)

H. Repair and Replacement

Objectives:

1. Describe how to recondition cylinder assemblies.
2. Discuss reassembly of pistons and rings.
3. Discuss safe and proper use of valve spring compressor.
4. Demonstrate safe and proper use of valve spring compressor.
5. Explain safe and proper procedures for grinding valves and valve seats.
6. Discuss the use of valve and valve-seat-grinding equipment.
7. Discuss safe and proper usage of a cylinder heat stand.
8. § Inspect, service, repair and reassemble a cylinder. (Level 3)(App. D.I, a. 2,3) (PP1-028)
9. Discuss reassembly of crankshaft and connecting rods.
10. Explain procedures to be used in reassembling a powercase.

CONTACT HOURS
PER TOPIC

COURSE TOPICS (continued)

Note: § Denotes required project

11. § Reassemble a powercase. (Level 2) (App. D.I, a. 2,3) (PP1-029)
12. Discuss final assembly and inspection of a complete engine.
13. § Perform reciprocating engine final assembly after overhaul. (Level 3) (App. D.I, a,2,3) (PP1-030)
14. § Perform an Induction system leak test. (Level 3) (App. D.II, h. 28) (PP1-031)
15. § Perform an exhaust systems leak test, troubleshoot and repair as needed. (Level 3) (App. D.II, j.31,32a) (PP1-032)

I. Reciprocating Engine Installation and Operation

Objectives:

1. Discuss de-preservation of an engine.
2. Describe inspection and de-preservation of accessories.
3. Explain the procedure for reciprocating engine installation.
4. § Install a reciprocating engine. (Level 3) (App. D.I, a. 3,4) (PP1-033)
5. Discuss inspection and replacement of powerplant external units and systems
6. § Install external accessories and/or systems. (Level 3) (App. D.I, a. 4) (PP1-034)
7. § Set idle speed and mixture control. (Level 3) (App. D.II, f. 23) (PP1-035)
8. § Inspect, service, and adjust a fuel-metering system. (Level 3) (App. D.II, f. 23) (PP1-036)
9. Discuss preparation of engine for ground and flight testing.
10. § Perform engine run-up and systems check. (Level 3) (App. D.I, a. 3,4) (PP1-036)
11. § Discuss and perform checks and adjustments of engine control systems. (Level 3) (App. D.I, a. 3,4; D.II, f. 23) (PP1-038)
12. § Perform oil-pressure adjustment and troubleshoot engine. (Level 3) (App. D.I, a. 3,4; D.II, d. 16) (PP1-039)
13. § Inspect, check, troubleshoot, and repair engine ice and rain control systems. (Level 2) (App. D.II, h. 26) (PP1-049)

J. Unit Test

II. RECIPROCATING ENGINE INSPECTION,
TROUBLESHOOTING AND MAINTENANCE

40

A. Engine Airworthiness Inspection

Objectives:

1. Discuss terms and definitions related to an engine inspection.
2. Explain the purpose of an engine inspection and the procedures used.
3. Discuss requirements for a preflight inspection.
4. § Perform pre-flight inspection of a reciprocating engine. (Level 3) (App. D.I, a. 3) (PP1-048)
5. Discuss opening and cleaning for 100-hour/annual inspections.
6. Explain servicing of oil screens and filters.
7. Discuss inspection of oil system lines.
8. State the purpose of a compression test and describe the two basic types of compression testers.
9. Discuss magneto inspection.

CONTACT HOURS
PER TOPIC

COURSE TOPICS (continued)

Note: § Denotes required project

10. Discuss inspection and cleaning of spark plugs.
11. Explain ignition harness inspection, testing and proper installation.
12. Discuss inspection and maintenance of the induction system air filters and ducting.
13. Discuss an inspection of the engine fuel system and fuel-metering system.
14. Explain the inspection and maintenance of engine controls.
15. Discuss the importance of proper inspection and maintenance of exhaust systems.
16. Describe engine mount types and inspection procedures.
17. Explain the importance of fire-wall seals.
18. Discuss the inspection of superchargers and turbochargers.
19. Discuss the inspection of engine instruments.
20. Explain an engine configuration inspection.
21. § Perform a configuration inspection on a reciprocating engine. (Level 3) (App. D.I, a. 3; c. 8) (PP1-049)
22. Explain Airworthiness Directive research.
23. § Perform AD research on engine and equipment, and record findings on AD compliance form. (Level 3) (App. D.I, a. 3; c. 8) (PP1-050)
24. § Complete 100-hour/annual inspection and make log book entries. (Level 3) (App. D.I, a. 3; c. 8) (PP1-051)

B. Troubleshooting

Objectives:

1. Define troubleshooting.
2. List and discuss the six steps in the troubleshooting procedure.
3. § Perform troubleshooting on engine, as assigned. (Level 3) (App. D.I, a. 4) (PP1-052)

C. Engine Electrical Inspection and Maintenance

Objectives:

1. Discuss the differences between a generator circuit and an alternator circuit.
2. § Connect a voltmeter into a circuit. (Level 3) (App. D. II, c. 13) (PP1-053)
3. § Connect an ammeter into a circuit. (Level 3) (App. D. II, c. 13) (PP1-054)
4. § Check for opens and shorts using an ohmmeter. (Level 3) (App. D. II, c. 13) (PP1-055)

D. Maintenance

Objectives:

1. Define maintenance.
2. Discuss types of maintenance.
3. Discuss the importance of using only approved data and exact specifications when performing maintenance.
4. Explain the need for proper log book entries.
5. § Write engine logbook entries to indicate compliance with an AD, and completion of 100-hour/annual inspection. (Level 3) (App. D.I, c. 8) (PP1-056)
6. Discuss FAA Form 337.

COURSE TOPICS (continued)	CONTACT HOURS <u>PER TOPIC</u>
Note: § Denotes required project	
7. § Complete FAA form 337, as required, for overhauled reciprocating engine with gear reduction and/or supercharger. (Level 3) (App. D.I, c. 8) (PP1-057)	
E. Unit Test	
III. EMPLOYABILITY SKILLS FOR POWERPLANT MAINTENANCE TECHNICIAN	25
A. Conducting Job Search	
1. Media and agency information sources.	
2. Exploring websites, career development centers, publications, and resource documents.	
3. Personal documents required when applying.	
B. Job Application	
1. Application forms.	
2. Resume writing.	
3. Punctuation and spelling.	
C. Interview Skills	
1. Types of interviews	
2. Etiquette required.	
3. Presentation skills.	
D. On the Job Behaviors	
1. Response to criticism.	
2. Work habits.	
3. Interpersonal relationships.	
E. Job Changes	
1. Promotions.	
2. Inter-department.	
3. New companies.	
F. Right-to-Know Law	
1. Florida statutes.	
2. Exceptions.	
IV. POWERPLANT II REMEDIATION, REVIEW, AND TESTING	30

PROGRAM TITLE: Aviation Maintenance Management

COURSE TITLE: Aviation Maintenance Technology Powerplant II

CIP NUMBER: 1649.010401

LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S): TITLES(S):

18.0 PERFORM BASIC RECIPROCATING ENGINE SKILLS--The student will be able to:

18.01 Inspect and repair a radial engine. [FAA FAR Part 147, Level 1]

18.02 Overhaul a reciprocating engine. [FAA FAR Part 147, Level 2]

18.03 Inspect, check, service, and repair reciprocating engines and reciprocating. [FAA FAR Part 147, Level 3]

18.04 Install, troubleshoot, and remove reciprocating engines. [FAA FAR Part 147, Level 3]

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]

32.0 DEMONSTRATE KNOWLEDGE OF FEDERAL AVIATION ADMINISTRATION POWERPLANT LICENSING REQUIREMENTS--The student will be able to:

32.01 Explain the requirements for obtaining FAA authorization to take the FAA Powerplant examinations.

33.0 DEMONSTRATE EMPLOYABILITY SKILLS FOR AN AVIATION MAINTENANCE TECHNICIAN (AMT) WITH AN FAA POWERPLANT RATING--The student will be able to:

33.01 Conduct a job search for an AMT position.

33.02 Secure information about the requirements for an AMT in a particular firm.

33.03 Identify documents that may be required when applying for an AMT position.

33.04 Complete a job-application form correctly.

33.05 Demonstrate competency in job-interview techniques.

33.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other employees.

33.07 Identify or adopt acceptable AMT work habits.

33.08 Demonstrate knowledge of how to make job changes appropriately.

33.09 Demonstrate acceptable employee health habits.

33.10 Demonstrate knowledge of the "Right-to-Know" law.



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: <u>AMT 1772</u>	SEMESTER CREDIT HOURS: <u>6</u>
COURSE TITLE: <u>Aviation Maintenance Technology Powerplant 2</u>	

Section 2

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

<input type="checkbox"/> AA Elective	X	AS Required Professional Course	<input type="checkbox"/> College Prep
<input type="checkbox"/> AS Professional Elective	X	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:

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

<i>Section 5</i>	
LEARNING OUTCOMES	METHOD OF ASSESSMENT
• Remove, overhaul and install a reciprocating engine	Practical test based on FAA Practical Test Standards
• Perform non-destructive methods of engine inspection	Practical test based on FAA Practical Test Standards
• Complete a 100-hour engine inspection	Practical test based on FAA Practical Test Standards
• Write engine logbook entries to include Airworthiness Directives	Practical test based on FAA Practical Test Standards
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Section 6

Name of Person Completing This Form: Richard Rozanski