**I. COURSE TITLE:** Aircraft Propellers and Cooling Systems

 **COURSE NUMBER:** 2363 **CATALOG PREFIX:** AVIT

**II. PREREQUISITE(S):**

**III. CREDIT HOURS:** 5 **LECTURE HOURS:** 3

 **LABORATORY HOURS:** 2 (2 contact) **OBSERVATION HOURS:**

**IV. COURSE DESCRIPTION:**

This course will introduce the student to aircraft propellers, engine lubrication, and cooling systems. Students will identify and select the proper lubricates used in aircraft engines. Students will inspect, check, service, and troubleshoot engine lubrications and cooling systems. Students will remove, inspect, service, and install aircraft fixed-pitch, constant-speed, feathering propellers, and propeller governing systems. Student will repair aluminum alloy propeller blades in accordance with appropriate manufacture data.

**V. ADOPTED TEXT(S):**

Jeppesen Maintenance

 A&P Technician

Powerplant Textbook

**VI. COURSE OBJECTIVES:**

Students will be able to:

• Identify and select lubricants (2)

• Repair engine lubrication system components (2)

• Inspect, check, service, troubleshoot, and repair engine lubrication

 systems (3)

• Inspect, check, service, and repair propeller synchronizing and ice

 control systems (1)

• Identify and select propeller lubricants (2)

• Balance propellers (1)

• Repair propeller control system components (2)

• Inspect, check, service, and repair fixed-pitch, constant-speed, and

 feathering propellers, and propeller governing systems (3)

• Install, troubleshoot, and remove propellers (3)

• Repair aluminum alloy propeller blades (3)

 Objective levels:

Level 1 requires:

Knowledge of general principles, but no practical application.

No development of manipulative skill.

Instruction by lecture, demonstration, and discussion.

Level 2 requires:

Knowledge of general principles, and limited practical application.

Development of sufficient manipulative skill to perform basic operations. Instruction by lecture, demonstration, discussion, and limited practical application.

Level 3 requires:

Knowledge of general principles, and performance of a high degree of practical application.

Development of sufficient manipulative skills to simulate return to service.

Instruction by lecture, demonstration, discussion, and a high degree of practical application.

**VII. COURSE METHODOLOGY:**

May include but not limited to Lecture and problem solving, independent and group projects, in-class and home assignments, quizzes, and tests. Problem solving will use both graphical and mathematical methods.

Attendance is required.

**VIII. GRADING**

A= 90-100

 B= 80-89

 C= 70-79

 D= 60-69

 F= 0-59

Grades of 69 and below will not meet the requirements of the FAA for Mechanic

Certificate .

See catalog for description of other possible grades.

**IX. COURSE OUTLINE:**

Weeks:

1. Reciprocating engine cooling, air cooling, helicopter cooling systems, liquid-cooling, temperature indicating systems, inspection and maintenance.

2. Turbine engines cooling, nacelle and compressor, combustion section, turbine section, engine insulation blankets.

3. Propeller designs, propeller theory, forces acting on a propeller.

4. Propeller pitch, propeller classifications, propeller construction.

Test 1

5. Fixed-pitch classifications, propeller construction, propeller designation.

6. Adjustable pitch propellers, ground-adjustable propellers, controllable-pitch propellers, constant-speed propellers, McCauley constant-speed propellers.

7. Hamilton-standard constant-speed propellers, Hartzell constant-speed propellers, feathering propellers.

8. Hamilton-standard hydromantic propeller.

Test 2

9. Turboprop propeller, propeller speed reduction, reversible-pitch propellers, turboprop fuel control, Hartzell, reversing propeller systems.

10. Pratt & Whitney PT6 propeller system.

11. Auxiliary propeller systems, synchronization systems.

12. Propeller ice control systems.

Test 3

13. Maintenance regulations, authorized maintenance personnel, propeller inspection, propeller maintenance on aircraft and off aircraft, balancing.

14. Checking blade angle, blade angle adjustments, blade tracking, propeller troubleshooting.

15. Propeller installation, flanged shaft, tapered shaft, splined shaft, propeller safety, propeller operational check.

16. Final test.

**X. OTHER REQUIRED TEXTS, SOFTWARE, AND MATERIALS:**

FAA AC-65-12A

Airframe and Powerplant Mechanics

Powerplant Handbook

 FAA-AC-43.13-1B/2B

Acceptable methods, Techniques, and practices of aircraft inspection and Repair

**XI. EVALUATION:**

Test count – 40% of Final Grade

 Quizzes count – 10% of Final Grade

 Lab Grade counts – 50% of Final Grade

**XII. SPECIFIC MANAGEMENT REQUIREMENTS:**

Class and lab attendance is mandatory. Students are required to be in class and lab to satisfy the time requirement of the FAA. Quizzes cannot be made up. No test can be taken late without prior approval of the instructor.

**XIII. OTHER INFORMATION:**

**FERPA:** Students need to understand that your work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**DISABILITIES:** Students with disabilities may contact the Disabilities Service Office, Central Campus, at 800-628-7722 or 937-393-3431.