

Course Number and Title: AVI 230-Powerplant Maintenance-Section I

Campus Location:

Georgetown

Effective Date:

2022-52

Prerequisite:

AVI 110, (MAT 152 or higher), (ELC 102 or concurrent) or possess a FAA Airframe License

Co-Requisites:

none

Course Credits and Hours:

15.00 credits

9.00 lecture hours/week

17.00 lab hours/week

Course Description:

This course introduces the fundamentals of powerplant maintenance. The units of study include reciprocating engine theory, reciprocating engine overhaul, reciprocating engine systems, reciprocating engine ignition and starting systems, reciprocating engine induction systems I, reciprocating engine induction systems II, reciprocating engine inspection, and troubleshooting.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:

None

Schedule Type:

Classroom Course

Disclaimer:

Attendance is governed by 14 Code of Federal Regulations (CFR) Part 147 and the policies of Delaware Tech as outlined in the college catalog. Federal Aviation Administration (FAA) regulations require that all students must receive a minimum number of hours of instruction, in both classroom and lab, and that all missed time must be made up before the student is allowed to take the FAA written, oral, and practical exams. Any conflict between school policies and FAA regulations in this matter, the FAA regulations shall take precedence. Missed classes and/or make-up work should be coordinated with the instructor either before or immediately after any absence.

Core Course Performance Objectives (CCPOs):

1. Reciprocating Engine Theory: Demonstrate basic principles of how a reciprocating aircraft engine works. Identify components associated with a reciprocating aircraft engine. (CCC 1, 2, 5; PPC PGC 1, 2, 4; AVI PGC 1, 2, 4)
2. Reciprocating Engine Overhaul: Demonstrate basic principles of reciprocating aircraft engine overhaul and the proper use of tooling and equipment. Demonstrate basic principles of inspection of aircraft engine components. (CCC 1, 2, 3, 4, 5, 6; PPC PGC 1, 2, 3, 4; AVI PGC 1, 2, 3, 4)
3. Reciprocating Engine Systems: Identify the various reciprocating engine operating systems. Demonstrate the basic methods of checking and servicing these systems. (CCC 1, 2, 4, 5, 6; PPC PGC 1, 2, 4; AVI PGC 1, 2, 4)
4. Reciprocating Engine Ignition and Starting Systems: Identify various ignition and engine starting systems. Demonstrate basic principles of repairing and servicing reciprocating engine ignition and starting systems. (CCC 1, 2, 3, 4, 5, 6; PPC PGC 1, 2, 4; AVI PGC 1, 2, 4)
5. Reciprocating Engine Induction System I: Demonstrate basic principles of inspection, repair, and maintenance of reciprocating engine induction systems. Identify components of a basic float type carburetor system, and demonstrate procedures in carburetor float adjustment. (CCC 1, 2, 3, 4, 5, 6; PPC PGC 1, 2, 4; AVI PGC 1, 2, 4)
6. Reciprocating Engine Induction System II: Identify various fuel injection system components, and demonstrate the basic principles of inspection, repair, and maintenance of a fuel injection system. (CCC 1, 2, 3, 4, 5, 6; PPC PGC 1, 2, 4; AVI PGC 1, 2, 4)
7. Reciprocating Engine Inspection and Troubleshooting: Demonstrate the proper procedures for removal and installation of a reciprocating aircraft engine. Demonstrate the proper procedures for a 100-hour inspection as well as proper run-up procedures of a reciprocating aircraft engine. (CCC 1, 2, 3, 4, 5, 6; PPC PGC 1, 2, 4; AVI PGC 1, 2, 4)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Reciprocating Engine Theory: Demonstrate basic principles of how a reciprocating aircraft engine works. Identify components associated with a reciprocating aircraft engine.
 1. Demonstrate basic skills in identifying types of engines, components, and systems.
 2. Obtain and follow the appropriate technical data for a given engine servicing and run-up.
 3. Start engine equipped with either a float type carburetor or fuel injection.
 4. Identify various types of aviation fuels and their octane ratings.
2. Reciprocating Engine Overhaul: Demonstrate basic principles of reciprocating aircraft engine overhaul and the proper use of tooling and equipment. Demonstrate basic principles of inspection of aircraft engine components.
 1. Demonstrate basic skills in locating appropriate technical data for disassembly and assembly of aircraft engine.
 2. Disassemble, inspect, repair, and reassemble an aircraft reciprocating engine.
 3. Correctly complete all required documentation, including engine logbook.
3. Reciprocating Engine Systems: Identify the various reciprocating engine operating systems. Demonstrate the basic methods of checking and servicing these systems.
 1. Identify various types of reciprocating engine components.
 2. Demonstrate how aircraft reciprocating engine instrumentation operates and how to inspect, repair, and maintain engine instruments.
 3. Demonstrate how aircraft reciprocating engine lubrication systems operate and inspect, repair, and maintain an engine lubricating system.
 4. Demonstrate how aircraft reciprocating engine exhaust systems operate and inspect, repair, and maintain an engine exhaust system.
4. Reciprocating Engine Ignition and Starting Systems: Identify various ignition and engine starting systems. Demonstrate basic principles of repairing and servicing reciprocating engine ignition and starting systems.
 1. Identify various types of reciprocating engine ignition systems.
 2. Demonstrate how aircraft reciprocating engine ignition systems operate and inspect, repair, and maintain these systems.
 3. Identify types of reciprocating engine motors and starting systems.
 4. Demonstrate how aircraft reciprocating engine motor and starting systems operate and inspect, repair, and maintain an engine exhaust system.
 5. Identify reciprocating engine electrical system components and inspect, repair, and maintain these systems.
5. Reciprocating Engine Induction System I: Demonstrate basic principles of inspection, repair, and maintenance of reciprocating engine induction systems. Identify components of a basic float type carburetor system, and demonstrate procedures in carburetor float adjustment.
 1. Identify various types of fuel metering systems.
 2. Demonstrate how aircraft reciprocating engine fuel metering systems operate and how to inspect, repair, and maintain an engine float type carburetor system.
6. Reciprocating Engine Induction System II: Identify various fuel injection system components, and demonstrate the basic principles of inspection, repair, and maintenance of a fuel injection system.
 1. Identify various types of fuel injection systems.
 2. Demonstrate how aircraft reciprocating engine fuel injection systems operate and inspect, repair, and maintain an engine fuel injection type system.
 3. Identify various types of aircraft reciprocating engine supercharging systems.
 4. Demonstrate how aircraft reciprocating engine supercharging systems operate and inspect, repair, and maintain a supercharging system.
 5. Identify various types of aircraft reciprocating engine components and inspect, repair, and maintain fuel storage, fuel delivery, and pressure systems.
7. Reciprocating Engine Inspection and Troubleshooting: Demonstrate the proper procedures for removal and installation of a reciprocating aircraft engine. Demonstrate the proper procedures for a 100-hour inspection as well as the proper run-up procedures of a reciprocating aircraft engine.
 1. Identify the appropriate technical data and procedures for removal and installation of a reciprocating engine on an aircraft.
 2. Demonstrate the removal and installation of an aircraft reciprocating engine from an assigned aircraft.
 3. Perform a 100-hour inspection on an aircraft reciprocating engine following all approved technical data, and complete all appropriate documentation as required.
 4. Demonstrate appropriate troubleshooting practices on an aircraft reciprocating engine.

Evaluation Criteria/Policies:

The grade will be determined using the Delaware Tech grading system:

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|----|---|-----|---|---|
| 90 | - | 100 | = | A |
| 80 | - | 89 | = | B |
| 70 | - | 79 | = | C |
| 0 | - | 69 | = | F |

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

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1. Demonstrate professionalism and adherence to safety and environmental procedures and regulations in the workplace.
2. Adhere to and apply appropriate FAA regulation and industry publications.
3. Explain and apply the principles of aircraft inspection, repair, and maintenance.
4. Explain and apply the principles of powerplant.

AVICERPPC

1. Demonstrate professionalism and adherence to safety and environmental procedures and regulation in the workplace.
2. Adhere to and apply appropriate FAA regulation and industry publications.
3. Explain and apply the principles of aircraft inspection, repair, and maintenance.
4. Explain and apply the principle of powerplant.

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.