

AMNT280e Powerplant Theory and Applications (Reciprocating Engines)

Level: 2

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY SEMESTER

E-Learning: BLENDED - Learning is done MAINLY online using interactive study materials in Canvas. Students receive guidance and support from online instructors via discussion forums and emails. This is supplemented with SOME face-to-face sessions. If the course has an exam component, this will be administered on-campus.

Synopsis:

The goal of this course is to provide an in depth study of the reciprocating engine. Topics include theory, construction, fuel metering, lubrication, exhaust, engine installation and overhaul, and operational maintenance procedures. (FAR Part 65.)

Topics:

- Reciprocating Engine Types, Theory, and Energy Transformation
- Reciprocating Engine Design and Construction
- Engine Removal and Replacement
- Engine Maintenance and Operation
- Induction and Exhaust Systems
- Engine Fuel and Fuel Metering
- Engine Ignition and Starting Systems
- Engine Lubrication and Cooling Systems
- Electrical Systems

Learning Outcome:

- Explain the basic theory of the two stroke and four stroke reciprocating engines. Define the factors affecting engine performance, including temperature, pressure, and density and altitude. Using charts and mathematical formulas solve indicated horsepower, fuel consumption, and thermal efficiency
- Explain the principles of operation, design features, and construction of the various types of reciprocating engines. Describe the classification methods, and firing orders of reciprocating engines.
- Explain reasons for engine removal, method of removal and installation, storage and corrosion prevention.
- Explain correct reciprocating engine maintenance procedures. Emphasis will be on the inspection intervals established by the FAA, and operation techniques. The correct use of manifold pressure and propeller controls.
- Define the correct procedures for reciprocating engine overhaul to include methods of visual, NDI, and dimensional inspection, repair and servicing of parts, engine performance testing, maintenance, and removal and installation.
- Analyze and interpret engine instruments used to monitor reciprocating engine performance.
- Define battery ignition, low and high-tension magneto ignition systems, auxiliary starting systems, and the theory, operation, and construction of the aircraft magneto. Explain the purpose of the ignition harness and spark plugs and their proper care and maintenance.
- Explain the operation of DC and AC generator controls.
- Explain the physics of energy transformation and factors affecting power output to include engine performance graphs. Compare the different grades of fuel. Describe the operation and maintenance of aircraft float carburetors, pressure carburetors, Bendix RSA, and Continental fuel injection system
- Explain reciprocating engine induction and cooling systems.
- Describe the properties of engine lubricants, and explain the operation and maintenance of wet sump and dry sump lubrication systems.

Assessment Strategies:

Continuous Assessment Component	Weightage (%)
TUTOR-MARKED ASSIGNMENT	100
Sub-Total	100

Examinable Component	Weightage (%)
Sub-Total	

Weightage Total **100**