



# EXECUTIVE FLIGHT TRAINING



**EXECUTIVE FLIGHT TRAINING'S CE-510 TYPE RATING SYLLABUS**

# **Introduction: To be eligible to enroll in our CE-510 type rating program. You must meet the following requirements:**

## **FAA REQUIREMENTS:**

Each student applicant must:

Hold a valid US Private student, or higher, certificate with Airplane – Multi-Engine Class and Instrument Airplane ratings.

Hold a valid Third Class, or higher US Medical Certificate.

## **EXECUTIVE FLIGHT TRAINING'S REQUIREMENTS:**

We pride ourselves on providing superior Citation instruction in a timely manner. Essentially, a type rating is a very thorough Citation checkout. It's an experienced instructor showing a student the tips and techniques of flying a Citation 510 series aircraft. To do that in an accelerated manner, we need you to bring some skills to the table. Such as:

1. IFR skills.
2. Currency. Using a jet to get back into aviation after a long absence is a recipe for failure. You must have flown within 3 months including having a current IPC & Flight Review.
3. Experience. High altitude, some turbine time, even another type rating makes the process much easier.
4. Total Flight Time: 1000 hours. 100 Turbine. 250 Multi-Engine.

# SUMMARY OF TRAINING

**SUMMARY:** This is a brief summary of how we train you to earn a Type Rating in a CE-510 series aircraft safely and efficiently. Our program consists of ground, CBT, simulator and airplane instruction. The completion standards are the ACS standards for the ATP. Even if you have a Private Student's license, you must fly to ATP standards. All of the training times are typically what we experience. At the discretion of the instructor, and based on the skill set of the student, actual training and flight time may be different. Each Ground Instruction or CBT module has a subject matter exam which requires a minimum of 80% to pass.

**COURSE OBJECTIVE:** To train and certify a CE-510 student to proficiency in the operation of the Cessna Citation 510 airplane. On completion of the ground and flight instruction, the student will be prepared for a practical test administered in accordance with 14 CFR Part 61 and the Airline Transport Student and Type Rating for Airplanes Airman Certification Standards. The instructor will act as a qualified Second-in-Command.

# GROUND INSTRUCTION

The Ground Instruction and CBT consists of 20 program hours of academic instruction covering the following aeronautical knowledge areas:

1. Safe and efficient operation of the aircraft
2. Weight and balance computations
3. Use of performance charts
4. Significance and effects of exceeding aircraft performance limitations
5. Principles and functions of aircraft systems
6. Maneuvers, procedures, and emergency operations appropriate to the aircraft
7. Night and high-altitude Operations.

# FLIGHT INSTRUCTION

The In-flight airplane Instruction and Citation 510 AATD training consists of 9 hours of program instruction time. The flight instruction required for the Practical Test includes the following areas:

- 1) Preflight preparation
- 2) Preflight procedures
- 3) Takeoff and departure phase
- 4) In-flight maneuvers
- 5) Instrument procedures
- 6) Landings and approaches to landing
- 7) Normal and abnormal procedures
- 8) Emergency procedures
- 9) Post flight procedures

***At the discretion of the instructor, and based on the skill and experience of the student, actual training and flight time may be adjusted.***

# TYPE RATING EXAM

**Testing Requirements:** Students seeking their initial type rating must satisfactorily complete the practical test in a Cessna 510 series airplane, administered by a pilot examiner (DPE) or FAA inspector who is authorized to conduct CE-510 type-rating examinations. The test will be conducted in accordance with 14 CFR Part 61 and the ATP ACS.



# CE-510 GROUND INSTRUCTION

**GENERAL OPERATIONAL SUBJECTS** Objective: The student will clearly understand the specific CE-510 operational requirements. Completion Standards: The student will demonstrate, by written or verbal testing, Airline Transport Pilot level knowledge of the subject matter.

## **Lesson #1** – Introduction (1 hour)

- A. Objective: The student will understand the training syllabus, training materials, and required level of preparation for each training session.
- B. Content: 1) Introduction and course overview.
- C. Completion Standards: The student must be able to demonstrate, by verbal testing and discussion, an understanding of the lesson content.

## **Lesson #2** – Regulations (0.5 hour)

- A. Objective: The student will understand the regulations regarding initial CE-510 type rating training and certification, recurrent training, differences training requirements; and CE-510 type rating privileges and limitations.
- B. Content: 1) 14 CFR Part 61 2) 14 CFR Part 91 3) FAA Order 8900.1 4) FAA Order 8900.2 5) FAA Minimum Equipment List
- C. Completion Standards: The student must be able to demonstrate, by verbal testing and discussion, an understanding of the lesson content.

# CE-510 GROUND INSTRUCTION

## **Lesson #3** – CE-510 Aircraft Publications and General Information (1 hour)

- A. Objective: The student will understand the aircraft's certification basis and general characteristics.
- B. Content: 1) CE-510 Airplane Flight Manual (AFM) and Operations Manual general layout, content and use 2) Aircraft General information 3) Operating Limitations
- C. Completion Standards: The student must be able to demonstrate, by verbal testing and discussion, an understanding of the lesson content.

## **Lesson #4** – Fuel (1 hour)

- A. Objective: The student will become familiar with the fuel system including AFM and Operations Manual normal and abnormal operating procedures.
- B. Content: 1) Fuel system – Tank location(s) and venting systems; capacity; drains; pumps; distribution; fuel controls; indicators; cross-feeding; fuel grade, color, and additives; fueling and defueling procedures; emergency substitutions. 2) AFM and Operations Manual normal procedures, limitations, and operational considerations.
- C. Completion Standards: The student must be able to demonstrate knowledge and understanding of the aircraft's fuel system.



# CE-510 GROUND INSTRUCTION

## **Lesson #5** – Engines (1 hour)

- A. Objective: The student will become familiar with the components and operation of the FJ44 series engines, including AFM and Operations Manual normal, abnormal and emergency operating procedures.
- B. Content: 1) Engine – Type Pratt & Whitney 615F; controls and indicators; fuel control; mounting points; turbine wheels; compressors; engine synchronizer. 2) Thrust reverser normal, abnormal and emergency operation. 3) Ignition system. 4) Oil system – Capacity; grade; quantities; indicators. 5) AFM and Operations Manual normal procedures, limitations, and operational considerations.
- C. C. Completion Standards: The student must be able to demonstrate understanding of the aircraft's engines.

## **Lesson #6** – Fire Detection and Protection System (1 hour)

- A. Objective: The student will become familiar with the components and operation of the fire detection system, including AFM and Operations Manual normal, abnormal and emergency operating procedures.
- B. Content: 1) Fire detection. 2) Fire suppression. 3) Smoke and Fume Elimination. 4) AFM and Operations Manual normal procedures, limitations, and operational considerations.
- C. Completion Standards: The student must be able to demonstrate knowledge and understanding of the aircraft's fire detection and protection system.

# CE-510 GROUND INSTRUCTION

## **Lesson #7** – Electrical System (1 hour)

A. Objective: The student will become familiar with the electrical systems and their operation.

B. Content: 1) AC/DC power; battery; feed bus; emergency bus; alternators; generators; circuit breakers and current limiters; controls; indicators; external ground power. 2) Normal AFM and Operations Manual operation and limitations of electrical power system units.

C. Completion Standards: The student must be able to demonstrate understanding of the electrical power system operation and limitations.

## **Lesson #8** – Hydraulic System (0.5 hour)

A. Objective: The student will become familiar with the hydraulic system and its operation and limitations.

B. Content: 1) Principles of hydraulics. 2) System construction features – capacity; pumps; pressure; reservoir; fluid grade; regulators and accumulators. 3) Use of hydraulic systems and subsystems. 4) Normal AFM and Operations Manual operation and limitation of hydraulic system.

C. Completion Standards: The student must be able to demonstrate understanding of the hydraulic system.

# CE-510 GROUND INSTRUCTION

## **Lesson #9** – Landing Gear and Brakes (0.5 hour)

A. Objective: The student will become familiar with the landing gear and brake system, its operation and limitations.

B. Content: 1) Landing gear system – indicators; tires; nose wheel steering; and shock struts, and normal and abnormal operations. 2) Brakes – components; operation.

C. Completion Standards: The student must be able to demonstrate knowledge, understanding and the operation of landing gear, brake systems and their limitations.

## **Lesson #10** – Flight Controls (0.5 hour)

A. Objective: The student will become familiar with and be able to operate the flight control systems.

B. Content: 1) Primary flight controls (yaw, pitch, and roll devices). 2) Secondary flight controls (flaps, trim, speed brakes). 3) AOA, stall, and speed warning devices. 4) AFM and Operations Manual normal and abnormal operating procedures and limitations.

C. Completion Standards: The student will be able to operate, demonstrate knowledge, and understand the flight control systems and their limitations.

# CE-510 GROUND INSTRUCTION

## **Lesson #11** – Environmental Systems (1 hour)

- A. Objective: The student will become familiar with the environmental systems and their operation.
- B. Content: 1) Air conditioning – heating; cooling; ventilation. 2) Pressurization – components; controls; indicators; regulating devices; system operation; emergency pressurization. 3) AFM and Operations Manual normal operating procedures and limitations.
- C. Completion Standards: The student must be able to demonstrate understanding of the environmental and pneumatic systems.

## **Lesson #12** – Ice and Rain Protection (0.5 hour)

- A. Objective: The pilot will become familiar with and be able to operate the airplane's ice protection systems.
- B. Content: 1) Ice detection. 2) Anti-ice and deice systems – pitot-static, wing and stabilizer leading edge, engine, and windshield. 3) AFM and Operations Manual normal operating procedures and limitations.
- C. Completion Standards: The pilot will be able to demonstrate knowledge and understanding of the airplane's ice protection systems and their limitations.

# CE-510 GROUND INSTRUCTION

## Lesson #13 – Avionic and Auto-flight Safe and Efficient Operation (0.5 hour)

- A. Objective: The pilot will be able to operate the airplane's flight instrument and auto-flight system.
- B. Content: 1) Panel arrangement. 2) Pitot-static system and instruments – Operation of the system, including drains, and alternate static sources; airspeed indicator bug settings, including markings; altimeter; vertical speed indicator. 3) Service Air and instruments – Operation of the system, including gauges and malfunction indications; attitude indicator; heading indicator; turn and slip indicator. 4) Electrically operated instruments – Turn and bank coordinator; attitude indicator; radio altimeter. 5) Magnetic compass – Errors in and use of magnetic compass system. 6) Air data computer (as applicable). 7) Stall avoidance and warning systems. 8) Flight director (FD). 9) Weather detection systems – Stormscope, radar (as applicable). 10) Traffic collision and avoidance system (TCAS, as applicable). 11) Flight management system (FMS, as applicable). 12) Autopilot– Interface with aircraft flight director and navigation systems, including automatic approach tracking.
- C. Completion Standards: The pilot must be able to demonstrate knowledge and understanding of the avionic and auto-flight systems.

# CE-510 GROUND INSTRUCTION

## **Lesson #14** – Communication and Navigation Equipment (0.5 hour)

- A. Objective: The pilot will become familiar with and be able to operate the airplane's communications equipment.
- B. Content: 1) VHF/HF radios; audio panels; interphone and passenger address systems; voice recorder. 2) Aircraft transponders, radio altimeters, electronic flight instrumentation system (EFIS), or computer-generated displays of aircraft position and navigation information. 3) Navigation receivers – VOR, NDB, RNAV, GPS, DME, and marker beacon.
- C. Completion Standards: The pilot must be able to demonstrate knowledge and understanding of the airplane's communication and navigation systems and equipment.

## **Lesson #15** – Weight and Balance (0.5 hour)

- A. Objective: The pilot will become familiar with the weight and balance limitations of the aircraft and be able to ensure the aircraft is properly loaded.
- B. Content: 1) Determining the current aircraft empty weight, center of gravity, and Zero Fuel Weight. 2) Computation of the weight and center of gravity for specified load conditions to include adding, removing, or shifting weight. 3) Determining if the center of gravity will be within limits for takeoff, flight, and landing. 4) Understanding the effect of fuel burn on the center of gravity.
- C. Completion Standards: The pilot will be able to demonstrate proficiency using the applicable charts to solve loading problems.

# CE-510 GROUND INSTRUCTION

## **Lesson #16** – Adverse Weather Practices (0.5 hour)

- A. Objective: The pilot will understand the Manufacturer's recommended practices for operating in adverse weather conditions.
- B. Content: 1) Operation in heavy precipitation. 2) Operation in snow, slush, and ice. 3) Operation in turbulence. 4) Low level wind-shear encounter. a) Takeoff and departure b) Approach and landing 5) Thunderstorm avoidance. 6) Cold weather precautions. 7) Low visibility Operations. 8) High, Hot & Heavy Operations.
- C. Completion Standards: The pilot will be able to demonstrate, by verbal testing and discussion, the Manufacturer's recommended adverse weather practices.

# CE-510 GROUND INSTRUCTION

**Lesson #17** – Performance Charts, Significance and Effects of Exceeding Aircraft Limitations (1 hour)

- A. Objective: The pilot will become familiar with the performance characteristics, limitations, and MEL for the aircraft.
- B. Content: 1) Review of aerodynamic fundamentals. 2) Airflow – Airfoils; aerodynamic effect of speed brakes, flaps, and other configurations. 3) Low/high-speed aerodynamics and stability. 4) Recommended airspeeds during specific phases of flight. 5) Stall/spin characteristics and limitations. 6) Performance charts, tables, tabulated data, and other related AFM and Operations Manual information – Accelerate-stop/accelerate-go distance; takeoff performance, with all engines and with one engine inoperative; climb performance, with all engines and with one engine inoperative; cruise performance; fuel consumption, range, and endurance; descent performance; and other performance data. 7) Normal, abnormal, and emergency performance characteristics. 8) Meteorological and weight-limiting performance factors (temperature, pressure, contaminated runways, precipitation, climb/runway limits) 9) Special operational conditions (e.g., unpaved runways and high-altitude airports). 10) Other information found in the approved AFM and Operations Manual on the aircraft's aerodynamics, performance, and limitations.
- C. Completion Standards: The pilot must be able to demonstrate use of the aircraft's performance charts to determine aircraft performance and limitations during all flight regimes.



# CE-510 GROUND INSTRUCTION

## **Lesson #18** –Night and High Altitude Operations (1 Hour)

- A. Objective: The pilot will become familiar with the procedures for night and high altitude Operations.
- B. Content: 1) Night Operations 2) High Altitude Operations
- C. Completion Standards: The pilot must be able to demonstrate knowledge of night and high altitude Operations.

## **Lesson #19** – Profiles (1 Hour)

- A. Objective: The pilot will become familiar with the techniques to correctly perform the flight maneuver profiles.
- B. Content: 1) Steep Turns, Stalls – takeoff, cruise, and departure, Unusual Attitudes 2) Engine shutdown and restart
  - b) Visual Approach and Landing 3) Instrument Approach and Landing 4) Circling Approach
- C. Completion Standards: The pilot must be able to demonstrate knowledge of the airplane maneuvers and instrument approach procedures.

## **Lesson #20** – Human Factors and Risk Management (2.0 hours)

- A. Objective: The pilot will become familiar with Human Factors (HF) issues and Risk Management techniques.
- B. Content: 1) Human physiology. a) Rest, naps, and sleep. b) Effects of drugs and alcohol. c) Smoking. d) Other stresses; e.g., divorce, finance. e) Eating habits. f) Stress management. 2) Hazardous attitudes. 3) Aeronautical decision making. a) Risk assessment. b) Risk management. c) How to develop decision making skills. 4) First flight of the day.
- C. Completion Standards: The pilot must be able to demonstrate knowledge of HF and risk management.

# CE-510 GROUND INSTRUCTION

## **Lesson #21** – Single Pilot Resource and Cockpit Resource Management (1.5 hours)

- A. Objective: The pilot will become familiar with Single Pilot and Cockpit Resource Management (CRM) techniques and be able to facilitate the smooth flow of information and application of skills between flight and ground crew members and ATC, and shall be capable of utilizing all available resources and installed equipment resulting in a safe, organized flight.
- B. Content: 1) Getting along with others. 2) Communications skills. 3) How to develop decision-making skills. 4) Standard Operating Procedures (SOPs). a) Use of checklists. b) “Do List” vs. “Done List”. c) Pilot flying and monitoring roles. 5) Critical situations. 6) Deviations from Standard Operating Procedures.
- C. Completion Standards: This lesson is complete when the pilot is able to demonstrate satisfactory knowledge on a written or oral examination on the lesson subject matter.

## **Lesson #22** – Review (3 hours)

- A. Objective: The pilot will become familiar with the systems and components covered.
- B. Content (as applicable): 1) Review any problem areas in preparation for the written or verbal examination.
- C. Completion Standards: The pilot must be able to demonstrate understanding of all material covered.

**Lesson #23** – Examination The pilot must be able to pass the written or oral examination on material covered during the ground instruction segment.

# FLIGHT INSTRUCTION

Amount of flight time should be adjusted according to the pilot's ability, time in type, and equipment. Portions of this may be accomplished in Cockpit Procedures Trainers (CPT), and Flight Training Devices (FTD), as available.

**OBJECTIVE:** The pilot shall apply the knowledge and skill acquired during ground training to flying the airplane.

**COMPLETION STANDARDS:** The pilot shall demonstrate proficiency in handling and operating the airplane by passing the flight portion of the practical test to levels consistent

# FLIGHT INSTRUCTION

## **Lesson #24** – Introduction to the Airplane; Instructional Preflight (2 hours)

- A. Objective: The pilot shall become familiar with the airplane, and will be able to apply the knowledge gained from ground training to the inspection of the airplane.
- B. Content: 1) Preflight discussion. 2) Introduction. (a) Airplane documentation – Registration; airworthiness certificate; maintenance logs; MEL/CDL. (b) Preflight inspection – Complete visual inspection of interior and exterior, using appropriate checklist. 3) Ground Operations. (a) Prestart checklist. (b) Control system checks. (c) Normal starting procedures. (d) Radio and electronic equipment checks. (e) Systems Operations familiarization and additional checks described in the approved AFM and Operations Manual, checklists, or other approved material appropriate to the airplane type and type of flight.
- C. Completion Standards: At the completion of this lesson, the pilot shall demonstrate basic airmanship qualities and understanding of flight characteristics of the aircraft.

# FLIGHT INSTRUCTION

## **Lesson #25** – Basic Maneuvers and Instrument Procedures (2 hours)

- A. Objective: The pilot shall become familiar the local training environment, and will be able to apply the knowledge gained from ground training to the operation of the airplane.
- B. Content: 1) Systems Operations familiarization and additional checks described in the approved AFM and Operations Manual, checklists, or other approved material appropriate to the airplane type and type of flight. 2) Taxiing. 3) Pre-takeoff checks, crew briefing as appropriate to the airplane type. 4) Normal or crosswind takeoffs. 5) Airspeed/V-speed control. 6) Straight and level cruise flight. 7) Climbs. 8) Descents. 9) Level, climbing, and descending turns. 10) Steep turns. 11) Approach to stalls. (a) Takeoff configuration. (b) Cruise configuration. (c) Landing configuration. 12) Approach to landing and landings. 13) Normal and crosswind landings. 14) Engine shutdown procedures. 15) Post-flight critique and preview of the next lesson.
- C. Completion Standards: At the completion of this lesson, the pilot shall demonstrate basic airmanship qualities and understanding of flight characteristics of the aircraft.

# FLIGHT INSTRUCTION

## **Lesson #26** – Advanced Maneuvers and Back-up Instrument Procedures (2 hours)

- A. Objective: The pilot shall practice advanced maneuvers and instrument approaches using back-up or fail-down display systems.
- B. Content: 1) Rejected and simulated single engine takeoffs. 2) V-speed control. 3) Steep turns. 4) Approach to stalls. (a) Takeoff configuration. (b) Cruise configuration. (c) Landing configuration. 5) In-flight Precautionary Engine Shutdown and Restart. 6) Approach to landing and landings with a simulated engine failure. 7) Rejected landing and missed approach with a simulated engine failure. 8) Approach to landing and landings with a simulated flap failure. 9) Circling approaches and landings. 10) Post-flight critique and preview of the next lesson.
- C. Completion Standards: At the completion of this lesson, the pilot shall demonstrate basic airmanship qualities and understanding of flight characteristics of the aircraft.

# FLIGHT INSTRUCTION

## **Lesson #27** – Proficiency Training (3 hours)

- A. Objective: The pilot shall develop proficiency in single-pilot takeoffs, landings, VFR patterns, and instrument work.
- B. Content. 1) Preflight discussion, single-pilot considerations. 2) Flight. (a) Review of previous lesson. (b) Practice takeoffs and landings to become proficient with power settings, airspeeds, and attitudes for flying a VFR pattern. (c) Takeoff with simulated IMC at or before reaching an altitude of 100 feet above the airport elevation. (d) ILS to missed approach. (e) ILS approach and landing. (f) Non-precision approach to the circling minimum descent altitude (MDA), followed by a change in heading and the necessary visual maneuvering to maintain a flight path that permits a normal landing on a runway at least 90° from the final approach course of the simulated instrument portion of the approach. 3) Comply with the practical test requirements and standards appropriate to the grade and class of pilot certificate the pilot holds, and demonstrate proficiency in circling approaches; and satisfactorily perform all maneuvers and procedures throughout the entire practical test as a single pilot.
- C. Completion Standards: At the completion of this lesson, the pilot must be able to perform the maneuvers contained in this lesson to PTS standards and takeoff and land without assistance from the instructor.

# FLIGHT INSTRUCTION

## **PRACTICAL TEST**

- A. Objective: The practical test shall be conducted in a CE-510 series aircraft or FAA Approved Flight Simulator. The applicant shall be able to demonstrate knowledge of, and operational proficiency in the CE-510 series aircraft and its systems during the practical test.
- B. B. Content: 1) Oral examination. 2) Flight test. 3) Evaluation and critique.
- C. C. Completion Standards: The pilot shall demonstrate the proficiency required to pass the practical test.





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