Multi-Engine Land Add-On/MEI Course

Welcome to Summit Flight Academy's Multi-Engine Training Course. We are excited that you have placed your trust in us to obtain your multi-engine add-on rating. Flying a multi-engine aircraft is a fun, yet serious adventure, that we're here to prepare you for. Your course prepares you to take the commercial (or private) multi-engine add-on checkride.

Training Prerequisites

An efficient multi-engine course does require some pre-work and currency in single engine aircraft to complete it in the given timeframe. We aim to make that as easy as possible for you by outlining the needs and the resources to accomplish them. If you have any questions before starting training, please reach out and we'll be happy to help.

Pilot Documents/Equipment: An up-to-date logbook, pilot certificate, medical/basic med, either a state ID + certified birth certificate or a valid passport (TSA requirement), EFB or paper charts, headset, and view limiting device will need to be brought to your training and to your checkride.

Current flying basic maneuvers: The ACS repeats a subset of tasks on your multi-engine checkride from the single engine ACS tasks. If you are not proficient performing steep turns, stalls, slow flight, emergency descents, and short field landings to ACS standards in a single engine aircraft, you may exceed your allotted program hours regaining proficiency. Ask us for a single engine refresher, if necessary, to reduce your total cost.

Instrument proficient: You will fly in simulated instrument conditions on your checkride, inclusive of flying an instrument approach on one engine. If you are not instrument proficient, please remedy this prior to the start of your program or ask us to complete a single engine Instrument Proficiency Check prior to your multi-engine course. Failure to be instrument proficient prior to starting this course may result in additional costs and/or the need to reschedule your checkride.

Renter's Insurance: Your program includes a short-term multi-engine insurance policy for non-owned aircraft. We will help you to secure the policy in office right before training starts. 50K Hull value and 1M/100K liability limits are required. If you already have coverage meeting this requirement, the cost will be discounted from your final payment. Be sure your policy covers multi-engine aircraft.

Piper Twin Comanche (PA-30) Familiarization: Below are links to the POH, avionics resources, checklist, airframe specific photos, and information such as weight/balance. Our Twin Comanche is equipped with the latest Garmin avionics, including dual GI-275s, a Garmin 750, and a GFC-500 autopilot. Given the pace of multi-engine training it is imperative that you be comfortable with the avionics, airframe systems, performance charts, and limitations prior to starting your course. You should come into training with key v-speeds memorized.

PA-30 Systems and Avionics Documents and Videos:

- PA-30 POH & AFM (Systems, Limitations, Normal and Emergency Procedures)
- PA-30 Summit Flight Academy Checklists
- N7664Y W&B
- N7664Y Aircraft familiarization photos
- PA-30 Emergency Gear Extension Video
- Garmin GI-275 Pilot Guide
- Garmin Gi-275 Video Orientation
- Garmin 650/750 Kings Introduction Video
- Garmin 750 Abbreviated Cockpit Guide
- Garmin 750 Simulator (iPad App)
- Garmin GFC-500 AFM
- Garmin GFC-500 Training Video

Multi-Engine Training and Aerodynamics: The bulk of your training is building your competence and confidence with multi-engine systems, multi-engine aerodynamics and how to manage the loss of an engine at any stage of flight. Review and understanding of these materials are imperative before beginning training in order to hit your scheduled checkride date. If you do not spend time reviewing and understanding these materials prior to your start date, you may need additional ground training beyond the scope of this course at $80/hour.

Multi-Engine Training Documents and Videos:

- Multi-Engine Oral Exam Guide
- FAA Private ACS or Commercial ACS or CFI ACS
- FAA Airplane Flying Handbook, Chapter 13
- FAA Pamphlet "Flying Light Twins Safely"
- "Leave Yourself an Out"
- V_{MC} Table Videos "PrettyFlyForACFI"
- "V_{MC}" Video Minimum Controllable Speed
- Critical Engine Factors "PrettyFlyForACFI"
- "The Drill" Engine Out Procedure

Sample schedule *(Multiple lessons may occur on a given day depending on scheduling needs of the student and/or staff):*

Day 1:

Ground Lesson 1: Multi-engine aerodynamics

Ground Lesson 2: PA-30 systems, performance, limitations

Sim Session 1: ME Emergency Practice

Day 2: Flight Lesson 1: Extensive Pre-Flight training, maneuvers, intro to single engine ops, and landings.

Day 3: Flight Lesson 2 (Maneuvers, single engine procedures, emergency procedures, single engine approach, landings, and debrief).

Day 4: Flight Lesson 3 (All ACS Tasks)

Day 5: Flight Lesson 4 (Clean up items)

Day 6:

Ground Lesson 3: (Mock Oral)

Flight Lesson 5: (Mock Checkride)

Day 7: Checkride

In the event of excessive inclement weather or mechanical delays, we will work with you and a DPE to replan training or schedule a second lesson on a given day. DPE availability in multi-engine aircraft is more limited than single engine aircraft due to experience requirements for each airframe. As a result, if a reschedule is necessary, delays may sometimes be encountered.

****If you are not from the Kansas City area, the airport has several local hotel discounts available. The airport rate at the Hampton Inn is $129. They have a rate at the Fairfield Inn for about the same. Best Western's best rate is to go through their app.

Multi-Engine Syllabus

Ground Lesson #1: Multi-Engine Aerodynamics

Lesson Objective: This lesson is intended to confirm basic understanding of the pre-course learning material on multi-engine aerodynamics and refine the student's knowledge to be a competent multi-engine pilot. At the conclusion of this lesson the student will demonstrate he/she exceeds ACS standards on the topics below.

S U CFI_____ Date: _____		Start Time:
		End Time:
		V_{MC}: What is it?
		$V_{MC:}$ How is it determined? Factors that affect $V_{MC.}$
		The Critical Engine
		Part 23 Multi-Engine Certification Standards (No single engine climb required)
		V_{MC} and altitude
		Engine Out Procedures aka "The Drill"
		Single Engine Performance
		Multi vs. Single Engine Operations
		Constant Speed Propellers in Multi-Engine Aircraft
		Propeller Synchronization
		Multi-Engine FARs

Instructor Notes:

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Simulator Lesson #1 (Optional)

Lesson Objective: This lesson is intended to speed the student's learning of key multi-engine flight concepts in a safe, low distraction environment prior to the first flight lesson. At the conclusion of this lesson the student will be able to perform from memory the key multi-engine emergency procedures as well as demonstrate the workflow for multi-engine checkride maneuvers.

S	U	CFI_____ Date: _____	Start Time: End Time:
		Simulator Orientation	
		Air Maneuvers: Steep Turns, Stalls and Slow Flight	
		Single Engine "Drill"	
		Single Engine Operations	
		Simulated Engine Failure and Emergency Procedures	
		Approach and Landing with an Inop Engine (AOA: X Task: D)	
		Drag Demo	
		V_{MC} Demo	
		Engine Shutdown/Feather/Restart	
		Single-Engine Approach and Landing	
		Postflight De-Briefing	

Instructor Notes:

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Ground Lesson #2: PA-30 Orientation

Lesson Objective: This lesson covers airframe model related ground instruction on the PA-30, specific information related to the student's PA-30 training aircraft, as well as general performance and limitations as they relate to multi-engine aircraft. At the conclusion of this lesson, the student will be able to articulate and then to apply this knowledge to subsequent flight lessons.

S	U	CFI_____ Date: _____	Start Time:
			End Time:
		V-Speed Review	
		Systems Orientation (Fuel, Powerplant, Flight Controls, Landing Gear, etc.)	
		Avionics Review	
		Weight and Balance	
		Performance and Limitations (Inclusive of Accelerate-Stop)	
		Operations and Maneuvers Checklist Review	
		Discussion of ground handling, directional stability and nose gear	
		Constant Speed Propellers in Multi-Engine Aircraft	
		Propeller Synchronization	
		Pre-Flight Flow	
		Dispatch and Post-Flight Procedures at SFA	

Instructor Notes:

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Flight Lesson 1: Multi-Engine Flight Orientation

Lesson Objective: To bring ground and simulator training into the air and introduce the student to flying multi-engine aircraft. At the completion of this lesson the student will have completed the below tasks. Task completion to ACS standards is not fully expected in this first flight lesson.

S	U	CFI_____ Date: _____	Start Time: End Time:
		Extensive Pre-Flight and Aircraft Orientation	
		Engine Starting/Taxing	
		Pre-Takeoff Checks	
		Normal Takeoffs	
		Climbs Operations	
		Propeller Synchronization	
		Slow Flight	
		Stalls: Power On, Power Off, Accelerated	
		Steep Turns	
		Single Engine Ops Intro: Simulated Single Engine Operation (“The Drill”)	
		Drag Demo	
		V_{MC} Demo	
		Approach and Landing with an Inop Engine (AOA: X Task: D)	
		Normal Landings (Taxi backs only)	
		Go arounds	
		De-brief	

Instructor Notes:

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Flight Lesson 2: Emergency Operations

Lesson Objective: To perform in air practice of multi-engine emergency procedures. At the completion of the lesson, the student should be able to complete memory checklists for key emergency procedures and safely cope with the given situations.

S	U	CFI_____ Date: _____	Start Time: End Time:
		Review Lesson 1	
		Emergency Procedures Pre-Flight Review/Discussion (45 mins)	
		Emergency Checklist Usage	
		Emergency Approach and Landing	
		Engine Failure during Takeoff before V_{MC}	
		Engine Failure Procedure after Liftoff	
		Go-around/Rejected Landing -Single Engine	
		Engine Restart (when/why-why not/how)	
		Simulated Engine Out Approach and Landing	
		X-wind Takeoff and Landing	
		Short-Field Take-off and Landing	
		Single Engine Approach (ME Add-on only)	
		Debrief	

Instructor Notes:

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Flight Lesson 3: All Expected ACS Tasks (Run Through)

Lesson Objective: To Review all ACS flight tasks to determine those in need of additional training or practice to perform safely and to ACS standards.

S	U	CFI_____ Date: _____	Start Time:
			End Time:
		Pre-Flight Briefing/Plan	
		Pre-Flight Tasks. (AOA: II Task A)	
		Flight Deck Mgmt and Engine Start/Taxi (AOA: II Tasks: B and C)	
		Run-up and Taxi (AOA: II Tasks: D and F)	
		Normal/Short takeoffs (AOA: IV Tasks: A and E)	
		Engine Failure During Takeoff before V_{MC} (AOA: IX Task: E)	
		Engine Loss after takeoff (Above 400' AGL). (AOA: IX. Task: F)	
		Slow Flight (AOA: VII Task: A)	
		Stalls (Power On, Power Off, Accelerated) (AOA: VII Tasks: B-D)	
		Maneuvering with One Engine Inoperative (AOA: X Task: A)	
		V_{MC} Demo (AOA: X Task: B)	
		Single Engine Maneuvering by reference to instruments (AOA: X Task: C)	
		Approach and Landing with an Inop Engine (AOA: X Task: D ME Add on) or Drag Demo (MEI)	
		Go-around/Rejected Landing (AOA: IV Task: N)	
		Systems and Equip Malfunctions: Engine Feather/Restart (AOA: IX Task: C)	
		Systems and Equip Malfunctions: No Flaps (AOA: IX Task: C)	
		Systems and Equip Malfunctions: Simulated Gear Failure (AOA: IX Task: C)	
		Normal and Short Field Approach and Landing (AOA: IV Task: B and F)	
		Emergency Decent (AOA: IX: Task A)	
		Debrief	

Instructor Notes:

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Flight Lesson 4: Clean-up Tasks

Lesson Objective: Flight Lesson 4 is designed by the instructor with student input to put focus on ACS tasks and maneuvers that were not consistently successful to ACS standards, are high risk operations, and those that typically cause students trouble on the checkride. At the completion of this lesson, the student should demonstrate mastery of all ACS flight tasks.

S	U	CFI_____ Date: _____	Start Time: End Time:
		Pre-Flight Briefing/Plan	
		Review and refine maneuvers not consistently meeting ACS standards	
		Review and refine maneuvers at instructor or student discretion	
		Repeat all other ACS tasks and maneuvers as time allows.	
		Debrief	

Lesson 4 Plan:

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Instructor Notes:

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Ground Lesson #3: Mock Oral Checkride

Lesson Objective: To ensure the student has retained understanding of all key multi-engine principles covered during this course and take the student through a mock oral exam for a multi-engine checkride. At the end of this lesson the student will have demonstrated he/she is prepared to exceed ACS standards on the knowledge topics and is competent on multi-engine aerodynamics, operations, systems, and regulations. The student and instructor will also complete checkride sign-off tasks.

S	U	CFI_____ Date: _____	Start Time: End Time:
		Multi-Engine FARs	
		Multi-Engine Aerodynamics and Operations	
		Inoperative Engine Principles and Operations	
		Other Emergency Procedures	
		Multi-Engine Systems (PA-30 Specific)	
		Weight and Balance	
		Performance and Limitations	
		Operations and Maneuvers Checklist Review	
		Airworthiness Requirements (Aircraft logbook review)	
		Checkride Endorsement and IACRA	

Instructor Notes:

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Flight Lesson 5: Mock Flight Checkride

Lesson Objective: To complete all expected in-flight ACS tasks in order to provide the CFI and student confidence that topics for the flight portion of the practical test meet ACS standards.

S	U	CFI_____ Date: _____	Start Time:
			End Time:
		Pre-Flight Briefing/Plan	
		Pre-Flight Tasks (AOA: II Task A)	
		Flight Deck Mgmt. and Engine Start/Taxi (AOA: II Tasks: B and C)	
		Run-up and Taxi (AOA: II Tasks: D and F)	
		Normal/Short takeoffs (AOA: IV Tasks: A and E)	
		Engine Failure During Takeoff before V_{MC} (AOA: IX Task: E)	
		Engine Loss after takeoff (Above 400' AGL) (AOA: IX. Task: F)	
		Slow Flight (AOA: VII Task: A)	
		Stalls (Power On, Power Off, Accelerated) (AOA: VII Tasks: B-D)	
		Maneuvering with One Engine Inoperative (AOA: X Task: A)	
		V_{MC} Demo (AOA: X Task: B)	
		Single Engine Maneuvering by reference to instruments (AOA: X Task: C)	
		Approach and Landing with an Inop Engine (AOA: X Task: D)	
		Go-around/Rejected Landing (AOA: IV Task: N)	
		Systems and Equip Malfunctions: Engine Feather/Restart (AOA: IX Task: C)	
		Systems and Equip Malfunctions: No Flaps (AOA: IX Task: C)	
		Systems and Equip Malfunctions: Simulated Gear Failure (AOA: IX Task: C)	
		Normal and Short Field Approach and Landing (AOA: IV Task: B and F)	
		Emergency Descent (AOA: IX: Task A)	
		Debrief	

Instructor Notes:

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