

**PA-34 Piper Seneca I  
Multi-Engine Land  
Rating  
Training Syllabus**

**FAA-S-8081-14 & AC 61-21A**

**PA-34 Multi-Engine Land Syllabus**  
**FAA-S-8081-14 & AC 61-21A**

*Page numbers appearing on the table of contents refer to the printed pages before they were cut and bound. Numbers appearing on the cut pages contain letters a and b for each cut page. This is because the uncut pages were printed two columns per page.*

**PURPOSE** This syllabus provides a detail of actions to be taken during flight & ground lessons for the addition of an Airplane Multi-Engine Rating on your Pilot Certificate. This syllabus is designed to be used in conjunction with flight training in a Piper PA-34 SENECA I aircraft. This syllabus is a checklist, a study outline, and a record of training.

**OBJECTIVES:** You will obtain the ground instruction, aeronautical skill, and experience necessary to meet the requirements for the addition of an Airplane Multi-Engine Rating on your Pilot Certificate.

**COMPLETION STANDARDS:** You show by written record, and will demonstrate through practical exercises, that you meet the required aeronautical skill, knowledge and experience to be recommended for the addition of an Airplane Multi-Engine Rating on your Pilot Certificate.

**COPYRIGHT NOTICE**

All words, pictorials, graphics and compiled information are protected from unauthorized use by U.S. Copyright Laws. The protected material may not be copied, by any means without prior written consent of Thomas W. Gorski 811 Ewald Avenue S. Salem, OR 97302 (503) 399-8764

N \_\_\_\_\_ Pilot \_\_\_\_\_  
 Type \_\_\_\_\_ CFI \_\_\_\_\_  
 Start \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
 Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

### **Lesson #1. NORMAL TAKEOFF**

- \_\_\_\_\_ (1) After completing all checks and when cleared to go, line up on runway centerline. Do not use parking brake, use toe brakes.
- \_\_\_\_\_ (2) When cleared for takeoff (or when ready) release brakes and smoothly add full power to both engines while using rudder to maintain directional control. **DO NOT HOLD FORWARD PRESSURE ON CONTROLS.**
- \_\_\_\_\_ (3) At Vmc+5 (85), rotate smoothly to about 5 deg.c nose up. Retract the gear when sufficient runway no longer remains. Rotate not more than 10 deg. nose up.
- \_\_\_\_\_ (4) Climb at not less than Vyse (105) or more than a 10 deg. nose up attitude.
- \_\_\_\_\_ (5) At 500 ft. AGL, lower nose to maintain Vyse and reduce to climb power (24 x 2400)
- \_\_\_\_\_ (6) At 1000 AGL, increase speed to 125 MPH and proceed on course. Shut off electric fuel pumps and landing lights (night ops only) Comply with any noise abatement procedures.

### **COMMON ERRORS**

- Failure to maintain runway centerline.
- Rotating before Vmc+5.
- Holding forward pressure on control during T.O.
- Failure to retract landing gear.
- Exceeding 10 deg. nose up.
- Failure to maintain a minimum of Vyse.

N \_\_\_\_\_ Pilot \_\_\_\_\_  
 Type \_\_\_\_\_ CFI \_\_\_\_\_  
 Start \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
 Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

### **Lesson #2. MAXIMUM PERFORMANCE TAKEOFF & CLIMB**

Note: Short field takeoffs are not recommended in multiengine aircraft. Use this procedure only in an emergency. Be aware that an extended climb below Vyse is inviting problems in the event of an engine failure.

- \_\_\_\_\_ (1) After completing all checks and when cleared to go, line up on runway centerline. Do not use parking brake, use toe brakes. Set flaps to 25 Deg.
- \_\_\_\_\_ (2) When cleared for takeoff (or when ready) release brakes and smoothly add full power to both engines while using rudder to maintain directional control. **DO NOT HOLD FORWARD PRESSURE ON CONTROLS.**
- \_\_\_\_\_ (3) At 75 MPH, rotate to 5 deg. nose up.
- \_\_\_\_\_ (4) When a positive rate of climb has been established, retract landing gear.
- \_\_\_\_\_ (5) Climb at 90 MPH until all obstacles have been cleared.
- \_\_\_\_\_ (6) After clearing all obstacles, lower nose to accelerate Vyse, and retract flaps.
- \_\_\_\_\_ (7) Continue as a normal takeoff.

### **COMMON ERRORS**

- Failure to set flaps.
- Not rotating at 75 MPH.
- Not increasing to Vyse after obstacles have been cleared.

N \_\_\_\_\_ Pilot \_\_\_\_\_  
Type \_\_\_\_\_ CFI \_\_\_\_\_  
Start \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

### Lesson #3. ENGINE FAILURE ON TAKEOFF PRIOR TO REACHING Vmc.

If an engine failure occurs on takeoff prior to reaching Vmc, the following "Rejected takeoff" procedure must be initiated IMMEDIATELY.

- \_\_\_\_\_ (1) FULLY CLOSE BOTH THROTTLES.
- \_\_\_\_\_ (2) APPLY MAXIMUM BRAKING.
- \_\_\_\_\_ (3) MAINTAIN DIRECTIONAL CONTROL.
- \_\_\_\_\_ (4) ADVISE ATC.

#### COMMON ERRORS

Failure to initiate procedure immediately.  
Failure to apply maximum braking.  
Failure to maintain directional control.  
Attempting to continue takeoff.

N \_\_\_\_\_ Pilot \_\_\_\_\_  
Type \_\_\_\_\_ CFI \_\_\_\_\_  
Start \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

### Lesson #4. CONSTANT ALTITUDE TURNS

- \_\_\_\_\_ (1) Enter from level flight at approx. 120 MPH using cruise power (20 X 2400)
- \_\_\_\_\_ (2) Clear the area. LOOK BOTH WAYS!
- \_\_\_\_\_ (3) Roll smoothly into a 45 deg. bank. At 30 deg., add back pressure.
- \_\_\_\_\_ (4) Make small corrections to pitch and bank.
- \_\_\_\_\_ (5) Be aware of tendency of nose to drop in turns.
- \_\_\_\_\_ (6) Begin roll-out 30 deg. before entry heading.
- \_\_\_\_\_ (7) On roll-out, release back pressure gently.

ACCEPTABLE PERFORMANCE  
Heading +/- 20 deg. (Pvt.)  
+/-10deg. (Comm & ATP)  
Altitude +/- 200' (Pvt.)  
=/-100' (Comm & ATP)  
Airspeed +/- 10 Kts.  
Bank +/- 5 deg.

#### COMMON ERRORS

Back pressure added too soon or too late.  
Roll-in rate too fast  
Roll-out rate too fast.  
Using rudder to control altitude.

N \_\_\_\_\_ Pilot \_\_\_\_\_  
Type \_\_\_\_\_ CFI \_\_\_\_\_  
Start \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

### Lesson #5. IMMINENT STALLS GEAR AND FLAPS DOWN

- \_\_\_\_\_ (1) Enter from level cruise at approx. 120 MPH. Power approx. 20 x 2400.
- \_\_\_\_\_ (2) "GUMP" check and reduce to 18" MAP.
- \_\_\_\_\_ (3) Clearing turn of 90 degrees (L or R) and add 1/3rd flaps. Maintain altitude.
- \_\_\_\_\_ (4) Make another clearing turn back to the entry heading and add 1/3rd more flaps. Maintain altitude.
- \_\_\_\_\_ (5) Maintain heading and landing flaps.
- \_\_\_\_\_ (6) Reduce power and maintain altitude. Or (enter 30 deg. turn (L or R)
- \_\_\_\_\_ (7) At FIRST indication of stall buffet, recover as follows: 1. Nose down below horizon and add full power while leveling wings. 2. Retract flaps and rotate to 2-3 deg. nose up attitude. 3. When a positive rate of climb is established, retract landing gear. 4. Climb and regain any lost altitude and then reduce to cruise power setting (20 x 2400)

#### COMMON ERRORS

- Failure to properly clear area.
- Failure to perform "GUMP" check.
- Failure to promptly recognize stall buffet.
- Delayed application of full power.
- Failure to retract flaps and gear as scheduled.

N \_\_\_\_\_ Pilot \_\_\_\_\_  
Type \_\_\_\_\_ CFI \_\_\_\_\_  
Start \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

### Lesson #6. IMMINENT STALLS GEAR & FLAPS UP

- \_\_\_\_\_ (1) Enter from level cruise at approx. 120 MPH. Power approx. 20 x 2400.
- \_\_\_\_\_ (2) Perform "GUMP" check and reduce to 18" MAP.
- \_\_\_\_\_ (3) Make a clearing turn of 90 degrees (L or R) and maintain altitude.
- \_\_\_\_\_ (4) Make another clearing turn back to the entry heading and set flaps for takeoff. Maintain altitude.
- \_\_\_\_\_ (5) Raise nose to about 10 Deg. nose up and maintain power. If instructed, start a 20-30 deg. bank L or R.
- \_\_\_\_\_ (6) Reduce power and maintain altitude. Or enter 30 deg. turn (L or R)
- \_\_\_\_\_ (7) At FIRST indication of stall buffet, recover as follows: 1-Lower nose to level flight attitude while adding full power and leveling wings. 2-At Vyse, raise nose 10 deg. up. 3-When a positive rate of climb is established, retract landing gear and climb to regain lost altitude. 4-Return to level cruise at 120 MPH. (20 x 2400)

#### COMMON ERRORS

- Failure to properly clear area.
- Failure to initiate recovery on first indication of stall.
- Failure to attain Vyse before starting climb.
- Failure to roll to wings level at beginning of recovery.

N \_\_\_\_\_ Pilot \_\_\_\_\_  
 Type \_\_\_\_\_ CFI \_\_\_\_\_  
 Start \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
 Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

### **Lesson #7. Vmc DEMONSTRATION**

- \_\_\_\_\_ (1) Enter from level cruise at about 120 MPH using cruise power (20 x 2400) Props and mixtures full forward, approx. 18"
- \_\_\_\_\_ (2) Make a clearing turn 90 degrees (R or L)
- \_\_\_\_\_ (3) Set flaps for T.O. and make a clearing turn back to entry heading.
- \_\_\_\_\_ (4) Maintain heading and add FULL power on BOTH engines. Reduce power on LEFT engine to idle. MAINTAIN HEADING AS SPEED DECREASES.
- \_\_\_\_\_ (5) Increase control input as necessary to maintain heading as speed decreases. RECOVER IMMEDIATELY IF STALL BUFFET OCCURS.
- \_\_\_\_\_ (6) At first indication of loss of control, recover as follows: 1-Lower nose below horizon and reduce power on the operating engine half-way, AND, HOLD BOTH RUDDER AND AILERON AGAINST THE TURN MAINTAIN DIRECTIONAL CONTROL! 2-When speed increases to  $V_{mc} + 10$  (90), increase power to full on operating engine. 3-Retract flaps and maintain  $V_y$  (105)

#### **COMMON ERRORS.**

- Failure to maintain heading on entry.
- Failure to maintain heading on recovery.
- Inadvertent stall.
- Failure to reduce power on recovery.
- Failure to add power after  $V_{mc} + 10$ .

N \_\_\_\_\_ Pilot \_\_\_\_\_  
 Type \_\_\_\_\_ CFI \_\_\_\_\_  
 Start \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
 Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

### **Lesson #8. NON-PRECISION INSTRUMENT APPROACHES**

- \_\_\_\_\_ (1) When on initial approach (Radar Vectors or pilot Nav.,) reduce speed to 120 MPH. (20 x 2400)
- \_\_\_\_\_ (2) Review the approach chart carefully and tune and identify all navaids. Also, calculate the rate of descent needed on final approach, and then time to missed approach point from the FAF.
- \_\_\_\_\_ (3) When cleared for the approach, AND on a published segment with an altitude specified, descend to the published altitude.
- \_\_\_\_\_ (4) When intercepting the final approach course inbound perform a "GUMP" check. This check may be delayed if DME, or another reliable fix is available to determine distance to the FAF. Make sure that the "GUMP" check is completed prior to crossing the FAF inbound.
- \_\_\_\_\_ (5) At the FAF inbound, reduce power to 13-14" MAP and begin descent to MDA. START TIMING IF APPLICABLE.
- \_\_\_\_\_ (6) At 100' above MDA, add power to level off (20" two-engines, full throttle on one engine)
- \_\_\_\_\_ (7) At the missed approach point, if runway in sight, make normal landing. If runway not in sight, begin a missed approach procedure.

NOTE: Except in very unusual situations, the use of flaps is not recommended. Flaps should be extended for landing after the runway is in sight.

#### **COMMON ERRORS**

- Failure to properly tune and identify NAVAIDS.
- Setting improper radials.
- Failure to maintain proper speeds.
- Failure to start time at FAF.
- Failure to level off at MDA.
- Failure to begin proper rate of descent at FAF.
- Failure to begin missed approach procedure at MAP.

N \_\_\_\_\_ Pilot \_\_\_\_\_  
 Type \_\_\_\_\_ CFI \_\_\_\_\_  
 Start \_\_\_\_\_ Date \_\_\_\_ / \_\_\_\_ /  
 End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
 Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

N \_\_\_\_\_ Pilot \_\_\_\_\_  
 Type \_\_\_\_\_ CFI \_\_\_\_\_  
 Start \_\_\_\_\_ Date \_\_\_\_ / \_\_\_\_ /  
 End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
 Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

## Lesson #9. ILS APPROACHES

ILS approaches will be conducted as follows:

- \_\_\_\_\_ (1) When on initial approach (Radar Vectors or pilot Nav.), reduce speed to 120 MPH.
- \_\_\_\_\_ (2) Review the approach chart carefully and tune and identify all navaids.
- \_\_\_\_\_ (3) When cleared for the approach, and when established on a published segment descend to the proper altitude.
- \_\_\_\_\_ (4) When intercepting the final approach course inbound perform a "GUMP" check. The "GUMP" check should be completed so that the landing gear will be extended just prior to intercepting the glide slope.
- \_\_\_\_\_ (5) Upon intercepting the glide slope, reduce power to establish a normal rate of descent on the glide slope. (Normally about 15-17" MAP) NOTE: THE POWER REQUIRED FOR DESCENT ON ONE ENGINE IS NOT MUCH DIFFERENT THAN USED ON A TWO-ENGINE APPROACH.
- \_\_\_\_\_ (6) At DH, if runway in sight, make a normal or one-engine landing. If runway not in sight, execute a missed approach procedure.

NOTE: Except in very unusual situations, the use of flaps on an instrument approach is not recommended. Flaps should be extended after runway is in sight.

### COMMON ERRORS

Failure to properly tune and identify NAVAIDS.  
 Not intercepting approach course.  
 Failure to perform GUMP in time to intercept GS.  
 Failure to reduce power to maintain descent rate.  
 Heading changes on localizer, particularly when making power changes on one engine approach.

## Lesson #10. MISSED APPROACH PROCEDURE

- \_\_\_\_\_ (1) Apply full power to both engines.
- \_\_\_\_\_ (2) Rotate to approx. 10 deg. nose up on two engines, or 5 deg. nose up on one engine.
- \_\_\_\_\_ (3) Retract flaps.
- \_\_\_\_\_ (4) When positive rate of climb is established, retract landing gear.
- \_\_\_\_\_ (5) Follow published missed approach instructions. Advise ATC.
- \_\_\_\_\_ (6) Continue as in normal takeoff.

### COMMON ERRORS

Failure to initiate missed approach at proper time.  
 Rotating to wrong nose-up attitude  
 Failure to retract flaps  
 Failure to attain positive rate of climb before retracting landing gear.  
 Failure to follow published instructions.  
 Forgetting to retract landing gear or flaps.

N \_\_\_\_\_ Pilot \_\_\_\_\_  
Type \_\_\_\_\_ CFI \_\_\_\_\_  
Start \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

N \_\_\_\_\_ Pilot \_\_\_\_\_  
Type \_\_\_\_\_ CFI \_\_\_\_\_  
Start \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
End \_\_\_\_\_ Flight \_\_\_\_\_ Actual \_\_\_\_\_  
Total \_\_\_\_\_ Pre /Post \_\_\_\_\_ Hood \_\_\_\_\_

## Lesson #11. NORMAL LANDING

- \_\_\_\_\_ (1) Enter downwind leg at 1000 AGL at approx. 120 MPH (20 x 2400)
- \_\_\_\_\_ (2) Perform GUMP check prior to reaching midfield.
- \_\_\_\_\_ (3) Abeam end of runway, reduce power, (approx. 15") extend flaps 1 notch, and begin descent.
- \_\_\_\_\_ (4) Turn base leg and extend second notch of flaps. Airspeed should be approximately 105-115 MPH.
- \_\_\_\_\_ (5) Turn final and extend landing flaps. Slow to approximately 100 MPH.
- \_\_\_\_\_ (6) When landing is assured, reduce power and flare. **TOUCHDOWN SHOULD BE ON MAIN WHEELS FIRST.**
- \_\_\_\_\_ (7) On landing roll, maintain directional control on centerline. **KEEP CONTROL WHEEL BACK UNTIL SLOWED.**
- \_\_\_\_\_ (8) After clearing runway, stop, retract flaps and contact ground, or taxi to parking.

### COMMON ERRORS

Failure to maintain altitude on downwind.  
Failure to maintain Vyse until landing is assured.  
Failure to maintain directional control on runway centerline.  
Not completing GUMP check.  
Not maintaining normal descent angle (VASI)  
Retracting flaps, or performing other operations while rolling on runway.

## Lesson #12. REJECTED LANDING

NOTE: A rejected landing is considered to be a go-around that is started from less than 50' and with gear and flaps full down. A rejected landing should NEVER be attempted on one engine, but you must realize that an engine failure could occur at any time during this procedure.

IF AN ENGINE FAILS AFTER THE DECISION HAS BEEN MADE TO EXECUTE A REJECTED LANDING, IT MUST BE HANDLED AS AN ENGINE FAILURE ON TAKE-OFF.

- \_\_\_\_\_ (1) Apply full power to both engines.
- \_\_\_\_\_ (2) Rotate to stop sink rate, and retract flaps.
- \_\_\_\_\_ (3) Accelerate to Vyse, then rotate to climb attitude.
- \_\_\_\_\_ (4) When a positive rate of climb is established, retract landing gear and flaps.
- \_\_\_\_\_ (5) Proceed as on normal takeoff.

### COMMON ERRORS

Failure to add maximum power.  
Rotating to the wrong attitude.  
Failure to retract flaps and landing gear.  
Poor directional control.