AOPA AIR SAFETY INSTITUTE

Safety Syllabus

COMPANION COPILOT

AIR SAFETY INSTITUTE
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Contents

Introduction

This syllabus is designed to help non-pilot flying companions learn about how an airplane flies and how to manipulate the airplane's flight controls. It includes an introduction to the principles of flight, a basic overview of instruments and radio communications, and how to deal with an emergency.

As a non-pilot passenger, you are first encouraged to watch the free *Companion Copilot* video series from the AOPA Air Safety Institute (ASI), then use this training syllabus to guide instruction further. ASI recommends using a certificated flight instructor (CFI) or an experienced, proficient pilot for the ground and flight instruction portions of the syllabus.

Completing this syllabus will help non-pilot passengers be more knowledgeable and better prepared to assist their pilot by becoming active participants in the flight—they may even decide to pursue additional flight training.

Part 1: *Companion Copilot* Video Series

ASI's *Companion Copilot* video series provides frequent companion passengers—who are not pilots—an opportunity to learn more about how they can help their pilot and enjoy being an active participant in the flight.

The series comprises *Preflight, Aviate, Navigate, Communicate*, and *Emergency* videos that cover preflight tasks, simple aerodynamics concepts, navigation and communication considerations, checklist use, and emergency procedures. For example, non-pilot passengers learn how they can help with the preflight, route planning, navigation, scanning for conflicting traffic, and radio communications at towered and non-towered airports, including how to work with ATC.

Non-pilot passengers will come away with a greater understanding of how airplanes fly, and they will be reassured that if an engine fails in flight, the airplane can glide to a safe landing. They will also be better prepared to enjoy the flight, knowing they can be of help using fundamental concepts reviewed in the videos.

Participants are encouraged to write down any questions or comments while viewing the video series, then follow up with a flight instructor or experienced pilot to get their questions answered. After viewing the entire video series, non-pilots should receive ground and flight instruction using this syllabus as a guideline.

ASI recommends conducting the ground and flight lessons in Part 1 and Part 2 separately.

This syllabus serves as a guideline for companion copilot training and should be tailored to the needs and experiences of the participants.

Companion Copilot video series:
AirSafetyInstitute.org/CompanionCopilot

Part 1: Aircraft Orientation

Ground Lesson

The following ground and flight lessons are designed to familiarize non-pilots with the basic control and operation of a general aviation aircraft. ASI encourages using a flight training device, simulator, or simply sitting in the aircraft on the ground to review the following items to help connect participants learning experience with the knowledge they gained from the *Companion Copilot* video series.

☐ Airplane Overview

- Aircraft exterior overview
- Cockpit layout
- Door, seat, and seatbelt/harness operation
- Safety equipment
- Yoke, rudder pedals, and brake system
- Basic instruments
- Radio and GPS locations
- Autopilot
- Ballistic Recovery System (BRS) or Cirrus Airframe Parachute System (CAPS)

☐ Basics of Flight

- Explanation of flight controls:
  - Yoke
  - Rudder
  - Trim
- Explanation of engine and prop controls:
  - Throttle
  - Mixture
  - Prop

Part 1: Aircraft Orientation

Ground Lesson, *continued*

- Coordinated flight (ailerons, rudder)
- Attitude flying using visual reference:
  - Straight-and-level
  - Climbs
  - Descents
  - Turns to heading
- Use of trim
- Basic flight instruments
- Basic engine instruments
- Using pitch and power settings to climb and descend
- Stall/spin avoidance

☐ Essential Communications

- Radio equipment:
  - ON/OFF switch
  - Volume
  - Microphone
  - Headset
  - Push-to-talk
  - Transmitting and receiving
  - Tuning – changing and selecting frequencies
- Towered vs. nontowered environments and related communications:
  - Who you are talking to
  - Who you are
  - Where you are
  - What you want
- Speaking slowly, clearly, and distinctly

Part 1: Aircraft Orientation

Ground Lesson, *continued*

- What to do in case of an emergency:
  - Declaring emergency on 121.5 or existing frequency if already in contact with ATC:
    - Who you are calling
    - Who you are
    - Declaring emergency (e.g., "I am not a pilot, and I have an emergency.")
- Transponder 7700

☐ Approach and Landing

- Runway selection and aircraft orientation for landing (wind, traffic, etc.)
- GUMPS check (Gas, Undercarriage, Mixture, Prop, Seatbelts/Shoulder harnesses)
- Power and flaps settings
- Aiming point on the runway
- Shallow banks and corrections
- Power setting (over the runway)
- Leveling off close to the runway
- Closing the throttle
- Stopping the aircraft
- Aircraft shutdown

Part 1: Aircraft Orientation

Flight Lesson

Lesson Objectives

- Aircraft overview
- Attitude flying using visual reference:
  - Straight-and-level
  - Climbs
  - Descents
  - Turns to heading
- Stall/spin avoidance
- Using basic instruments and aircraft radios
- Approaches and landings

Part 1: Aircraft Orientation

Flight Lesson, *continued*

☐ Preflight/Taxi/Takeoff

- Emphasize safety precautions around aircraft
- Preflight walk-around
- Prestart checks and engine starting
- Steering the aircraft on the ground with rudder pedals and braking
- Use of throttle and resulting power changes
- Location of radio transmit button and how to use
- Relate takeoff attitude to climbing

☐ Attitude Flying

- Attitude and power settings for level flight
- Relieving control pressures with small trim adjustments
- Climbs, descents, turns, and level flight and corresponding power settings

☐ Basic Instruments, Radios, and Transponder

- Heading indicator, altimeter, and airspeed indicator
- Aircraft radio and tuning/switching frequencies
- GPS operation and navigating to the airport
- Transponder (VFR 1200 or simulate 7700 for emergency)

☐ Approaches and Landings

- Runway selection (wind, traffic, etc.)
- Approaching at 1,000 feet agl
- Aiming aircraft at the landing area
- Descending for landing
- GUMPS check (all applicable items)
- Power settings for landing
- Touchdown, rollout, and braking

Part 2:
Dealing With an Emergency

Ground Lesson

The following scenario-based ground and flight lessons should be taught after Part 1: Aircraft Orientation. Remember that this syllabus is a guide, and the CFI should tailor it to the non-pilot's particular needs and experience.

☐ **Emergency Communications**
- o Declaring emergency on 121.5 or existing frequency if already in contact with ATC:
  - Who you are calling
  - Who you are
  - Declaring emergency (e.g., "I am not a pilot, and I have an emergency.")

☐ **Autopilot Operation**
- o If OFF, leave it OFF—if ON, leave it ON
- o ON/OFF Switch
- o Changing selected altitudes and headings
- o Use of power with the autopilot

☐ **GPS Navigation**
- o Direct-To button and operation
- o Magenta-line navigation
- o Nearest airport function and direct-to navigation

☐ **Transponder to 7700**
- o Transponder operation
- o Ident feature

☐ **Pilot Ill or Incapacitated**
- o Assist the pilot
- o Importance of remaining calm
- o Use of checklist

Part 2:
Dealing With an Emergency

Ground Lesson, *continued*

☐ **Companion Copilot Flight Briefing**

- Brief the scenario
- Pilot simulates ATC
- Priorities during scenario
- Review the In-Flight Guide (page 12)
- Print the Emergency Checklist to carry on board (page 14)

Part 2:
Dealing With an Emergency

Flight Lesson

Lesson Objectives

- Practice real-world emergency scenario with instructor/pilot simulating ATC
- Maintaining positive control of the aircraft while requesting assistance from ATC
- Declaring an emergency with ATC and complying with ATC instructions to navigate to the nearest airport (using GPS as an additional aid is optional)
- Communications at nontowered airports
- Adjusting airspeed and altitude for safe approach and landing
- Landing aircraft and taxiing to ramp area

Part 2: Dealing With an Emergency

Flight Lesson, *continued*

☐ **Review of Aircraft Control**
- o Climbing, descending, straight and level, turns to heading
- o Power settings
- o Flaps, mixture, propeller, undercarriage operation

☐ **Review of Basic Radio Communications**
- o Declaring emergency on 121.5 or existing frequency if already in contact with ATC:
  - Who you are calling
  - Who you are
  - Declaring emergency (e.g., "I am not a pilot, and I have an emergency.")

☐ **Simulated Emergency Situation**
- o Return to the practice area and rehearse simulated emergency radio call to ATC, navigation, and landing scenario, including nontowered airport communications
- o Follow simulated ATC vectors to the airport using GPS "Direct-To" function as optional navigation aid
- o Optional use of autopilot to help control aircraft
- o Approach and landing using GUMPS (Gas, Undercarriage, Mixture, Prop, Seatbelts/Shoulder harnesses) check and visual aiming point

☐ **Landing, Taxi, and Shutdown**
- o Safely land the aircraft and stop on the runway or taxiway
- o Taxi aircraft to parking
- o Shut down aircraft

In-Flight Guide

The following **two-page** summary for dealing with an emergency is a quick checklist that non-pilots can review after completing Parts 1 and 2 of this syllabus. Both pages are designed to be printed and either laminated or kept in a pilot kneeboard for quick reference in an emergency. ASI recommends that non-pilots and pilots review it together and keep it in a place that is easily accessible.

❑ Fly the Airplane First!

- If the autopilot is ON, leave it ON. If it is OFF, leave it OFF!
- Keep the aircraft straight and level on the horizon.
- Make sure the airspeed is in the green arc. Trim the aircraft if necessary.
- Move any obstacles in the way of the instruments and controls.

❑ Communicate

- Put on a headset; place the microphone near your lips (use the handheld microphone if there is no headset).
- Press the push-to-talk switch and clearly tell ATC you have an emergency. Remember to speak slowly and clearly into the mic. Try the frequency you're on first.
- If there is no response, tune 121.5 into all radios and push the radio switch button to switch 121.5 to the active frequency. Clearly state what is happening. Time permitting, put 7700 into the transponder.

❑ Navigate

- Follow ATC instructions and headings using the heading indicator—ATC will lead you to an airport for landing. Ask questions and make sure you have the information you need.
- If unable to contact ATC, use the GPS (if available) to find the "NRST" airport and go "Direct-To" that airport.
- If needed, use a sectional chart to find landmarks around you and locate a nearby airport.

In-Flight Guide

continued

❑ Approach

- Slowly descend to 1,000 feet above the airport elevation as you arrive in the airport area.
- Follow ATC instructions to get lined up with the runway. If not in contact with ATC, line up with a runway of intended landing.
- Once lined up, aim the aircraft at a landing point, usually the white bars or stripes of the runway.
- Reduce power and slowly descend toward the runway, keeping the aiming point at the same point on the windshield. Keep your airspeed in the green arc.
- Do a GUMPS check and verify Gas is on the fullest tank, the Undercarriage (landing gear) handle is down and brake pressure feels normal, the Mixture (red-knob) is pushed forward, the Propeller knob (blue) is pushed forward, and Seatbelts/Sholder harnesses are secure.
- Use the flaps if necessary to aid in slowing the aircraft.

❑ Landing

- Continue toward the runway, making slight changes with the throttle as necessary to keep the aiming point in the same position. If too low, add a small amount of power; if too high, reduce a slight amount of power. In either case maintain the same pitch attitude by adjusting pressure on the control yoke.
- Maintain a gradual descent toward the runway.
- As the aircraft crosses the end of the runway, pull the throttle (black knob) back toward you all the way, and let the aircraft settle onto the runway.
- Use toe brakes to bring the aircraft to a complete stop.
- Pull the mixture control (red knob) all the way out to stop the engine.
- Unless there is a fire or other emergency, stay with the aircraft until help arrives.

Emergency Checklist

CALL SIGN:_____ AIRCRAFT TYPE: _____
DESTINATION: _____

COMPANION COPILOT EMERGENCY CHECKLIST

FLY THE AIRLPLANE

- ☐ STAY CALM AND FASTEN SEAT BELTS/HARNESS
- ☐ FLY STRAIGHT AND LEVEL ON THE HORIZON
- ☐ AUTOPILOT — LEAVE ON IF ON, LEAVE OFF IF OFF

CALL ATC – DECLARE EMERGENCY

- ☐ CALL ATC ON THE EXISTING FREQUENCY OR 121.5
- ☐ TELL THEM YOU'RE NOT A PILOT
- ☐ DECLARE AN EMERGENCY

NAVIGATE TO AIRPORT

- ☐ MAINTAIN CONTROL OF AIRCRAFT
- ☐ FOLLOW ATC INSTRUCTIONS
- ☐ USE GPS TO AID NAVIGATION (OPTIONAL)

APPROACH AND LAND

- ☐ ADJUST POWER, PITCH and FLAPS for DESCENT
- ☐ MAINTAIN SAFE AIRSPEED IN THE GREEN ARC
- ☐ GEAR DOWN AND LOCKED (IF APPLICABLE)

SHUTDOWN

- ☐ THROTTLE – IDLE (PULL BLACK KNOB OUT)
- ☐ MIXTURE – OFF (PULL RED KNOB OUT)
- ☐ IGNITION – OFF