

Instrument Pilot Flight Instruction Lesson Plan

Steep Turns

Student: _____ Date: _____

Objectives:

Upon completion of this lesson, the student will:

- Be able to perform 45° banked turns solely by reference to the flight instruments.

Elements:

- Steep Turns
- G-Forces
- Overbanking Tendency
- Situational Awareness/Division of Attention
- Rapid instrument scan and cross check

Schedule:

• Pre-lesson briefing	00:10
• Pre-Flight and flight to practice area	00:10
• Practice Steep Turns	00:20
• Flight back to airport	00:10
• Post-lesson debriefing	00:10
Total:	01:00

Equipment:

- IFR Capable airplane
- View limiting device
- Sick Sacks

Instructor Actions:

1. Pre-lesson briefing
 - Present lesson objective.
 - Describe what will take place during the lesson.
 - Review vertical and horizontal components of lift; explain need for increased power and elevator back pressure to compensate for loss of vertical lift.
 - Review over-banking tendency.
 - Review proper procedure to correct for loss of altitude (reduce bank, apply back pressure).
 - Review the effect of steep banks on load factor and importance of entering the maneuver at V_A or the airplane manufacturer's recommended airspeed.
 - Review effect of increased load factor on stall speed.
 - Review how to lead the rollout.

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2. Pre-flight and flight to practice area
 - Observe that the student performs the proper preflight checks of the instruments, navigation equipment and airplane systems appropriate for an IFR flight.
 - Use the opportunity to practice the student's general instrument flying skills. With the student wearing the view limiting device, give him or her instructions to fly various headings, perform standard rate turns, climbs and descents, etc.
 - Review the procedures for steep turns prior to the student starting the maneuver.
3. Demonstrate and have student practice steep turns to right and left.
 - Have student perform clearing turns; instructor clears the area.
4. Return flight
 - Use the opportunity to practice the student's general instrument flying skills. With the student wearing the view limiting device, give him or her instructions to fly various headings, perform standard rate turns, climbs and descents, etc.
5. Post Lesson Debriefing
 - Critique student's performance of maneuvers with constructive suggestions to improve technique.
 - Answer student questions.
 - Ask student questions to evaluate what was learned.
 - Explain what will be covered in the next lesson and assign reading material.

Student Actions:

1. Pre-lesson briefing
 - Ask questions concerning previous lessons and/or this one.
2. Pre-flight and flight to practice area
 - The student performs the proper preflight checks of the instruments, navigation equipment and airplane systems appropriate for an IFR flight.
 - Takeoff and fly to practice area on headings (+/- 10⁰) and at altitudes (+/- 100 ft.) specified by the instructor while flying strictly by reference to the instruments.
3. Perform steep power turns to the left and to the right.
 - Entry altitude > 1,500 AGL.
 - Perform clearing turns prior to starting the maneuver.
 - Establish airspeed at V_A or as recommended by the POH.
 - Maintain altitude +/- 100 ft., airspeed +/- 10 Knots; bank 45⁰ +/- 5⁰; roll out on entry heading +/- 10⁰.
 - Perform the maneuver to the left and to the right (Begin with single 360⁰ turns in either direction; then left turn followed immediately by right turn).
4. Return flight from practice area
 - Fly to the airport on headings (+/- 10⁰) and at altitudes (+/- 100 ft.) specified by the instructor while flying strictly by reference to the instruments.
5. Post-flight debriefing.
 - Ask questions about the lesson.

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Completion Standards:

This lesson will be completed when the student is able to perform steep turns in both directions within the tolerances specified in the *Student Actions* section.

Common Errors:

- Improper Coordination; particularly on right turns.
- Failure to maintain proper airspeed.
- Fixating on a single instrument.
- Altitude control.
 - Improper recovery procedure when loosing altitude.
 - Gaining altitude when changing direction and during exit from the maneuver.

References:

- Instrument Flying Handbook (FAA-H-8083-15); 5-26
- Instrument PTS Area of Operation IV Task F.

Possible Review Questions:

V_A is the airplane's _____. What is it for the airplane (being used)? Why is it important?

Back pressure and an increase in power is needed in the steep turn because of the loss of _____.

The airplane turns because of the _____ of lift.

When performing a steep turn, opposite aileron is needed because of the airplane's _____.

When you loose altitude in the steep turn, the proper procedure to return to the desired altitude is to _____ the bank, and increase the _____.