Private Pilot Flight Instruction Lesson Plan
Flight By Instruments / Unusual Attitude Recovery

Student: _____ Date: _____

Objectives:

- To introduce the student to flight performed entirely by reference to instruments.

Elements:

- Instrument scan techniques
- Basic attitude flying skills
- Recognition and recovery from unsafe attitudes.

Schedule:

• Pre-lesson briefing	00:10
• Pre-Flight and takeoff	00:15
• Straight & Level flight by instrument reference	00:10
• Constant airspeed climbs and descents by reference to instruments	00:10
• Turns to headings by reference to instruments	00:10
• Recovery from unusual attitudes by reference to instruments	00:10
• Post-flight procedures	00:10
• Post-lesson debriefing	00:15
Total:	01:30

Equipment:

- View limiting device (hood, foggles, etc.)
- Mock instrument panel or picture of an instrument panel.
- Sick Sacks

Instructor Actions:

1. Pre-lesson briefing
   - Present lesson objective.
   - Describe what will take place during the lesson.
   - Review use of flight instruments in instrument flying.
   - Explain proper instrument scan technique.
   - Explain standard rate turns.
   - Review aeromedical factors related to instrument flying; specifically the fact that your senses may deceive you.
   - Explain two basic unusual attitudes; nose up, and nose down. Explain how to recognize and how to correct for each.
2. Pre-Flight and Takeoff
   - Specify an initial altitude for the student to climb to before starting the lesson proper.

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3. Straight & Level Flight by Reference to Instruments
   - Have student put on view limiting device and get comfortable with it while the instructor flies and looks for traffic.
   - Have student fly straight and level using instruments (Primary pitch instrument is altitude, primary bank instrument is heading, others are supporting).
4. Constant Airspeed Climbs and Descents by Reference to Instruments
   - Have student climb and descent while in straight flight solely by reference to the instruments (Primary instruments during transition are AI and VSI). Primary instruments once established are altitude, heading and airspeed.
5. Turns to Headings by Reference to Instruments
   - Have student perform turns to headings while maintaining level flight. Primary instruments during transition are AI and TC.
6. Recovery from Unusual Attitudes by Reference to Instruments.
   - Have student relinquish the flight controls and look at his or her feet while instructor flies the plane.
   - Put the airplane into a nose-high turning attitude near stall speed
   - Turn controls back to the student and coach student through the appropriate recovery procedure
   - Have student relinquish the flight controls and look at his or her feet while instructor flies the plane.
   - Put the airplane into a nose low turning attitude near V_{NO} (conditions permitting)
   - Turn controls back to the student and coach student through the appropriate recovery procedure.
7. Post-flight
8. Post Lesson Debriefing
   - Review what was learned and critique students performance of maneuvers with constructive suggestions to improve technique.
   - Ask student questions to evaluate understanding of what was learned.
   - Answer student questions
   - 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 takeoff
   - Perform pre-flight and pre-takeoff procedures using appropriate checklists
   - Perform takeoff and climb to practice altitude as specified by the instructor.
3. Straight & Level Flight by Reference to Instruments
   - Put on view limiting device and get comfortable with it while the instructor flies and looks for traffic.
   - Fly straight and level using instruments, maintaining altitude +/- 200 feet, heading +/- 20 degrees and airspeed +/- 10 knots.
4. Constant Airspeed Climbs and Descents by Reference to Instruments
   - Perform constant airspeed climbs to designated altitudes +/- 200 feet.
   - Perform constant airspeed descents to designated altitudes +/- 200 feet.
   - Maintains heading +/- 20 degrees and airspeed +/- 10 knots for both maneuvers.
5. Turns to Headings by Reference to Instruments
   - Performs standard rate turns to headings while maintaining level flight +/- 200 feet.

Student: _____ Date: _____

- Rolls out on the assigned heading +/- 20 degrees.
- Maintains airspeed +/- 10 Knots.

6. Recovery from Unusual Attitudes by Reference to Instruments.
   - Recognizes unusual attitudes by reference to instruments.
   - Recovers to stabilized level flight using proper instrument cross-check interpretation and smooth coordinated control application.
     - Nose high attitude – Full power; lower nose; level wings
     - Nose low attitude – Power off; level wings; raise nose
   - Perform post-flight procedures using appropriate checklists.
7. Post-flight debriefing.
   - Ask questions about the lesson.

Completion Standards:

This lesson will be completed when the student is able to perform all of the maneuvers within the tolerances specified in the *Student Actions* section.

Common Errors:

- Improper instrument scan technique; fixating on one instrument.
- Needle chasing; Over control.
- Improper interpretation of instrument indications

References:

- POH/AFM for airplane used
- Airplane Flying Handbook (FAA-H-8083-3A); 16-12 – 16-16
- Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25); Chapter 16
- Medical Handbook for Pilots (AC 67-2) ; Chapter 14
- PRIVATE PILOT – ASEL PTS Area of Operation IX

Possible Review Questions:

When flying by instruments, the primary instrument for bank is the _____ and the primary instrument for pitch is the _____.

What are the indications of a nose high attitude? What is the proper recovery procedure?

What are the indications of a nose low attitude? What is the proper recovery procedure?

When rolling out of a turn, the roll out should be initiated how many degrees ahead of the desired heading?

In a standard rate turn, the airplane will turn 90^0 in how many seconds?