

Instrument Pilot Flight Instruction Lesson Plan

Basic Attitude Flying – 2 – Constant Airspeed / Rate Climbs and Descents

Student: _____ Date: _____

Objectives:

Upon completion of this lesson, the student will:

- Be able to perform constant airspeed climbs and descents solely by reference to the flight instruments.
- Be able to perform constant rate climbs and descents solely by reference to the flight instruments.

Elements:

- Instrument Cross Check
- Instrument Interpretation
- Aircraft Control
- Constant airspeed climbs and descents
- Constant rate climbs and descents.
- Turning climbs and descents at constant airspeed
- Turning climbs and descents at constant rate
- Review of:
 - Straight and level flight by reference to instruments.
 - Standard rate turns by reference to instruments.

Schedule:

• Pre-lesson briefing	00:15
• Pre-Flight and flight to practice area	00:15
• Constant airspeed climbs and descents	00:10
• Constant rate climbs and descents	00:10
• Constant airspeed climbing and descending turns	00:10
• Constant rate climbing and descending turns	00:10
• Return flight from practice area	00:10
• Post-lesson debriefing	00:10
Total:	01:30

Equipment:

- Airworthy airplane with standard flight instruments (Airspeed, Attitude Indicator, Altimeter, Turn Coordinator, Heading Indicator [or HIS / RMI], Vertical Speed Indicator).
- View limiting Device (Foggles, Hood, etc.)
- Appropriate IFR en-route charts.

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Student: _____ Date: _____

Instructor Actions:

1. Pre-lesson briefing
 - Present lesson objective and outline of the lesson.
 - Review the method of scanning the instruments
 - Review instrument cross check procedures
 - Review procedure for changes of airspeed while in straight and level flight
 - Review procedure for establishing and maintaining a standard rate turn
 - Discuss which instruments are primary and secondary for pitch, bank and power when:
 - Transitioning from level flight to a constant airspeed climb or descent and back to level flight.
 - Transitioning from level flight to a constant rate climb or descent and back to level flight.
 - Discuss instrument interpretation as it applies to:
 - Transitioning from level flight to a constant airspeed climb or descent and back to level flight.
 - Transitioning from level flight to a constant rate climb or descent and back to level flight
2. Pre-flight and flight to practice area
 - Once at an appropriate altitude for the lesson (> 1,500 AGL), have the student don the view-limiting device and review:
 - Straight and level flight at constant airspeed
 - Change of airspeed while maintaining straight and level flight
 - Establishing and maintaining standard rate level turns.
 - The remaining parts of the lesson should be performed upon reaching the practice area.
3. Demonstrate the method for entering and maintaining constant airspeed climbs and descents and coach student through the process.
4. Demonstrate the method for entering and maintaining constant rate climbs and descents and coach student through the process.
5. Demonstrate the method for entering climbing and descending turns at constant airspeed and coach student through the process.
6. Demonstrate the method for entering climbing and descending turns at constant rate and coach student through the process.
7. Return flight from practice area.
 - Simulate ATC instructions to the student to:
 - Climb and descend to various altitudes using constant airspeed and constant rate climbs and descents.
 - Turn to various headings while climbing or descending at constant airspeed or rates.
8. 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.

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Student: _____ Date: _____

Student Actions:

1. Pre-lesson briefing
 - Ask questions concerning previous lessons and/or this one.
2. Pre-flight and flight to practice area
 - Perform pre-flight and pre-takeoff procedures using appropriate checklists
 - Upon reaching an appropriate altitude for the lesson (> 1,500 AGL), put on the view-limiting device and fly to the practice area while practicing:
 - Straight and level flight at constant airspeed.
 - Change of airspeed while maintaining straight and level flight
 - Establishing and maintaining standard rate level turns.
 - Maintain altitude +/- 100 ft., heading +/- 10⁰ and airspeed +/- 10 Knots.
 - Rolls out on assigned headings +/- 10⁰.
3. Perform constant airspeed climbs and descents to various altitudes as assigned by the instructor.
 - Maintain headings +/- 10⁰ and airspeed +/- 10 Knots.
 - Level out on assigned altitudes +/- 100 feet.
4. Perform constant rate climbs and descents to various altitudes as assigned by the instructor.
 - Maintain headings +/- 10⁰.
 - Maintain climb or descent rate +/- 100 feet per minute.
 - Level out on assigned altitudes +/- 100 feet.
5. Perform turning (standard rate) constant airspeed climbs and descents to various altitudes as assigned by the instructor.
 - Roll out on assigned headings +/- 10⁰.
 - Maintain airspeed +/- 10 Knots.
 - Level out on assigned altitudes +/- 100 feet.
6. Perform turning (standard rate) constant rate climbs and descents to various altitudes as assigned by the instructor.
 - Roll out on assigned headings +/- 10⁰.
 - Maintain climb or descent rate +/- 100 feet per minute.
 - Level out on assigned altitudes +/- 100 feet..
7. Return flight from practice area
 - Student will comply with instructor simulated ATC instructions to change heading and airspeed.
 - Maintain altitude +/- 100 ft. and airspeed +/- 10 Knots.
 - Maintain heading in straight and level flight +/- 10⁰.
 - Roll out on assigned headings +/- 10⁰.
 - Level out on assigned altitudes +/- 100 ft.
8. 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 straight climbs and descents at either a constant airspeed or constant rate, solely by reference to the flight instruments, maintaining altitude +/- 100 feet, heading +/- 10°, and airspeed +/- 10 knots.

Common Errors:

- Improper instrument scan technique, for example fixating on a single instrument.
- Improper instrument interpretation.
- Failure to maintain coordinated flight in turns.
- Failure to periodically check the heading indicator against the magnetic compass.
- Loss of aircraft control, particularly in descending turns.

References:

- Instrument Flying Handbook (FAA-H-8083-15); Chapters 4 and 5
- INSTRUMENT PTS Area of Operation IV Tasks C, D
- CFII Handouts; Instrument Classification

Possible Review Questions:

In a constant airspeed climb or descent, the primary instruments for pitch, bank and power are the _____, _____ and the _____.

In a constant rate climb or descent, the primary instruments for pitch, bank and power are the _____, _____ and the _____.