

# Instrument Pilot Flight Instruction Lesson Plan

## Timed Turns to Compass Headings

Student: \_\_\_\_\_ Date: \_\_\_\_\_

### Objectives:

Upon completion of this lesson, the student will:

- Be able to perform turns to specified headings using the magnetic compass, turn coordinator and a clock (i.e. without the heading indicator)..

### Elements:

- Magnetic compass errors
- Standard rate turns
- Partial panel flying

### Schedule:

• Pre-lesson briefing	00:15
• Preflight airplane	00:10
• Departure and flight to practice area	00:10
• Demonstration of compass errors	00:10
• Practice standard rate turns with full panel	00:05
• Practice turns to headings using turn coordinator, compass and clock	00:20
• Return flight from practice area	00:10
• Post-lesson debriefing	00:10
Total:	01:30

### Equipment:

- Airplane suitably equipped for IFR flight
- View limiting device
- Clock with sweep second hand or digital timer with seconds readout

### Instructor Actions:

1. Pre-lesson briefing
  - Present lesson objective and outline of the lesson.
  - Review compass errors
    - Compass lags behind turns from northerly headings.
    - Compass leads turns from southerly headings.
    - Compass reads approximately correct on turns from easterly or westerly headings.
    - Compass reaction to acceleration and deceleration on easterly and westerly headings.
  - Describe standard rate turns and half-standard rate turns and when to use them.
2. Preflight airplane.
  - Observe that the student performs the proper preflight checks of the instruments, navigation equipment and airplane systems appropriate for an IFR flight.

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3. Departure and flight to practice area.
  - Use the opportunity to review basic attitude flying techniques as necessary.
4. Demonstrate compass errors to student.
5. Practice standard rate turns with full panel.
  - Have student perform level turns to specified headings at standard and half-standard rate using the full panel.
6. Practice turns to headings using turn coordinator, compass and clock.
  - Have student perform standard rate and half-standard rate turns to specified headings with the heading indicator covered.
  - Have student perform standard rate and half-standard rate turns to specified headings with both the heading indicator and attitude indicator covered.
7. Return flight from practice area.
  - Use the opportunity to review basic attitude flying techniques as necessary.
8. Post Lesson Debriefing
  - Critique student's performance of tasks 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. Preflight airplane.
  - The student performs the proper preflight checks of the instruments, navigation equipment and airplane systems appropriate for an IFR flight.
3. Departure and flight to practice area.
  - Student will comply with instructor given instructions for straight and level flight, level turns to headings, constant airspeed and constant rate climbs and descents and climbing and descending turns.
4. Demonstration of compass errors.
  - Student will observe the compass behavior while the instructor shows the effects of turns from various headings and acceleration and deceleration.
5. Practice standard rate turns with full panel.
  - Student will perform level turns to specified headings at standard and half-standard rate using the full panel.

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6. Practice turns to headings using turn coordinator, compass and clock.
  - Student will perform standard rate and half-standard rate turns to specified headings with the heading indicator covered.
  - Student will perform standard rate and half-standard rate turns to specified headings with both the heading indicator and attitude indicator covered.
7. Return flight from practice area.
  - Student will comply with instructor given instructions for straight and level flight, level turns to headings, constant airspeed and constant rate climbs and descents and climbing and descending turns.
8. Post-flight debriefing.
  - Ask questions about the lesson.

### Completion Standards:

- This lesson will be completed when the student is able to perform standard and half-standard rate turns to specified headings using only the magnetic compass, turn coordinator and a clock, maintaining altitude +/- 100 feet, airspeed +/- 10 Knots and rolls out on the specified heading +/- 10°.

### Common Errors:

- Student fails to maintain the specified rate of turn.
- Student fails to correctly time turns (either loses track of the time or miscalculates the time required).
- Student fails to scan all instruments properly and loses or gains altitude.

### References:

- Instrument Flying Handbook (FAA-H-8083-15); 3-9 – 3-10, 5-25
- Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25);
- Instrument PTS Area of Operation IV Task E.

### Possible Review Questions:

Ask student questions about compass errors; turns from east-west headings and north-south headings  
Ask about acceleration/deceleration errors.