

Instrument Pilot Ground Instruction Lesson Plan

Preflight Preparation – Cross Country Flight Planning

Student: _____ Date: _____

Objectives:

Upon completion of this lesson, the student will:

- Plan an IFR cross country flight including:
 - Selecting an appropriate route (Preferred IFR routing if available).
 - Selecting appropriate altitudes.
 - Assembling all appropriate en-route charts, Departure Procedures, STARs, NOTAMs applicable to the proposed flight.
 - Completing a navigation log for the flight to include flight time and fuel requirements based on given (current or as given by the instructor) weather conditions.
 - Completing an IFR flight plan for the flight (FAA Form 7233-1).
- Be able to explain how aircraft performance factors affect the flight planning process.

Elements:

- Route selection criteria
- Altitude selection
- Departure Procedures, STARs, Approach charts
- Aircraft performance factors
- Weather information
- Navigation logs and FAA Flight plan forms
- Pilot judgement and decision making

Schedule:

• Pre-lesson briefing	00:05
• Review weather forecast	00:10
• Discuss route selection	00:10
– Preferred IFR routes	
– Appropriate altitude selection	
– Severe weather avoidance	
– Departure and Arrival Procedures	
– Approaches	
• Discuss aircraft performance factors	00:10
– Fuel consumption	
– True airspeed	
– Fuel reserve requirements	
– Power setting selection	
• Complete navigation log for the proposed flight	00:40
• Complete an IFR flight plan (FAA Form 7233-1)	00:05
• Review of lessons learned/questions and answers	00:10
Total:	01:30

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Equipment:

- Printed weather forecast products (METAR, TAF, Area Forecast, Radar Summary Chart, Prognostic Charts, Surface Analysis Chart, Convective Outlook Chart, etc.) and/or Flight Service briefing.
- Local, distant and FDC NOTAMs.
- Applicable en-route, departure procedure, arrival and approach charts.
- Appropriate AF/D
- Navigation log forms
- FAA Form 7233-1
- POH for airplane to be used

Instructor Actions:

1. Pre-lesson briefing
 - Present lesson objective and outline of the lesson.
2. Review weather forecasts
 - Have the student describe the expected weather for the route of the flight using either current conditions or a set of forecasts provided by the instructor.
 - The student should be able to:
 - Determine the possibility of convective activity along the route.
 - Determine the possibility of icing along the route.
 - Determine the possibility of moderate or severe turbulence along the route.
 - Determine the winds aloft at various altitudes along the route.
 - Determine the forecast weather conditions at the destination and determine whether an alternate is necessary or not.
 - If an alternate is necessary, the student should determine whether the forecast conditions at the expected time of arrival at the alternate meet the requirements.
3. Discuss route selection.
 - Show student how to determine if there is a preferred IFR route available for the flight (AF/D or Jeppesen charts).
 - Show the student how to select applicable en-route, arrival and departure and approach charts.
 - Review use of the applicable charts.
 - Review departure minimums, climb minimums, approach minimums
 - Show student how to select appropriate altitudes for the flight based on
 - En-route MEA, MOCA, MRA, etc. altitudes
 - Winds aloft forecasts
 - Icing possibilities
4. Discuss aircraft performance factors.
 - Show student how to select an appropriate power setting for the flight based on the POH data.
 - Show the student how to determine amount of fuel required for climb and ground ops.
 - Discuss minimum fuel reserve requirements for the flight.

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5. Complete navigation log for the proposed flight.
 - Work through the complete flight plan with the student
 - Discuss
 - How to pick navigation facilities to determine the overall route.
 - On-airway versus off-airway route selection and reporting requirements.
 - How to anticipate the approach in use at the destination.
 - Complete the navigation log including
 - ETA at each fix selected to define the route.
 - Fuel requirements for each leg and overall.
 - Headings for each leg accounting for winds at altitude.
 - Groundspeed for each leg accounting for winds at altitude.
6. Complete an IFR flight plan (FAA Form 7233-1)
7. Post Lesson Debriefing
 - Review the material covered in the class.
 - 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 for clarification of the lesson objective and outline if necessary.
2. Review weather forecasts
 - The student will describe the expected weather for the route of the flight using either current conditions or a set of forecasts provided by the instructor.
 - The student will:
 - Determine the possibility of convective activity along the route.
 - Determine the possibility of icing along the route.
 - Determine the possibility of moderate or severe turbulence along the route.
 - Determine the winds aloft at various altitudes along the route.
 - Determine the forecast weather conditions at the destination and determine whether an alternate is necessary or not.
 - If an alternate is necessary, the student will determine whether the forecast conditions at the expected time of arrival at the alternate meet the requirements.
3. Discuss route selection.
 - Student how to determine if there is a preferred IFR route available for the flight (AF/D or Jeppesen charts).
 - Student will select applicable en-route, arrival and departure and approach charts.
 - Student will determine if there are departure minimums or climb minimums applicable to the flight
 - Student will determine if the approach minimums at the destination will allow a good probability of being able to complete an approach based on the forecast weather conditions.

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- Student will select appropriate altitudes for the flight based on
 - En-route MEA, MOCA, MRA, etc. altitudes
 - Winds aloft forecasts
 - Icing possibilities
- 4. Discuss aircraft performance factors.
 - Student will select an appropriate power setting for the flight based on the POH data.
 - Student will determine the amount of fuel required for climb and ground ops.
 - Student will determine the minimum fuel reserve requirements for the flight.
- 5. Complete navigation log for the proposed flight.
 - The student will complete a navigation log for the proposed flight including:
 - Picking navigation facilities to determine the overall route.
 - Pick the anticipated approach in use at the destination.
 - ETA at each fix selected to define the route
 - Fuel requirements for each leg and overall.
 - Headings for each leg accounting for winds at altitude.
 - Groundspeed for each leg accounting for winds at altitude.
- 6. Complete an IFR flight plan (FAA Form 7233-1)
- 7. Post Lesson Debriefing
 - Ask for clarification of anything that is not fully understood.
 - Answer instructors questions to evaluate what was learned.
 - Ask any questions pertaining to the next lesson.

Completion Standards:

This lesson will be completed when the student is able to complete an accurate navigation log for an IFR flight and is able to complete FAA Form 7233-1 for that flight.

Common Errors:

- Student fails to accurately analyze weather reports.
- Student fails to obtain NOTAMs (Local, Distant and FDC).
- Student makes calculation errors in planning
- Poor route selection

References:

- Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25); Chapters 10 and 11
- Instrument Flying Handbook (FAA-H-8083-15); 10-1 – 10-3
- Instrument PTS Area of Operation I Task B.

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Possible Review Questions:

When flying off the airways, the pilot must report arriving at what fixes along the route to ATC?

When flying off the airways, what rules apply to altitude selection?

How do you determine what areas of the country are designated as mountainous terrain?

The departure procedure for your airport requires a minimum climb of 400 feet per nautical mile. If your groundspeed during the climb is 90 Knots, what minimum rate of climb (feet per minute) must you maintain?