COLLEGE OF ATMOSPHERIC & GEOGRAPHIC SCIENCES
SCHOOL OF AVIATION
The UNIVERSITY of OKLAHOMA

Homework

Instrument Flying - AVIA 3572

The lessons in this homework packet correspond to each of the flight lessons you will fly. Each homework lesson is designed to prepare you for the tasks that you will be practicing for that specific training flight.

Each homework lesson consists of the overall objective of the corresponding flight lesson, a required reading list, and study questions to reinforce your understanding of the material. To adequately prepare for each lesson, you are expected to complete the homework assignment before you come to fly.

What you should bring to each flight lesson:

- Completed homework
- Completed weight and balance
- Syllabus ticket for that lesson
- Pilot License, medical, photo ID, and logbook

NAME: GRADE: _____

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Stage 6, Lesson 1 Homework

At the completion of this lesson, the student will: Gain knowledge on equipment required for IFR flight, operation of flight instruments, and demonstrate an understanding of the full panel instrument references as they relate to aircraft control.

READING ASSIGNMENT

§91.205 – Instrument and Equipment Requirements
Instrument Flying Handbook – Chapter 5 “Flight Instruments”
Instrument Flying Handbook – Chapter 6 “Airplane Attitude Instrument Flying”
Jeppesen Instrument/Commercial Chapter 2A and 2B

1. What instruments and equipment are required for IFR flight?

2. Draw and label the pitot-static system.

3. Draw and label the airspeed indicator.

4. Draw and label the altimeter.

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5. Draw and label the vertical speed indicator.

6. Draw and label the vacuum system.

7. What are the two principles of gyroscopic instruments?

8. Which system is the turn coordinator typically powered by? Why?

9. What makes a turn coordinator different from a turn-and-slip indicator?

10. What are the fundamental skills of attitude instrument flying?

11. What are three methods of instrument cross-check?

12. What are the common cross-check errors?

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Stage 6, Lesson 2 Homework

At the completion of this lesson, the student will: Gain knowledge on the instrument cockpit check, function of the magnetic compass, and demonstrate an understanding of the full panel instrument references as they relate to aircraft control.

READING ASSIGNMENT
OU Supplementary Information for Flight Students
Instrument Flying Handbook – Chapter 5 “Flight Instruments”
Instrument Flying Handbook – Chapter 6 “Airplane Attitude Instrument Flying”
Jeppesen Instrument/Commercial Chapter 2B

1. When performing an instrument cockpit check for IFR flight, which instruments do you verify, and what specific conditions are you looking for in each?

2. What type of fluid is housed inside of the magnetic compass? Why?

3. What is variation and what does it change with?

4. What is deviation and what does it change with?

5. What are the two basic methods for learning attitude instrument flying?

6. What are your control instruments when using the Control and Performance Method?

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7. How does the use of control and performance instruments correlate to aircraft control?

8. What are the procedural steps in using the Control and Performance Method?

9. List the pitch, bank, and power instruments when using the Primary and Supporting Method.

10. For straight-and-level flight, what are your primary and supporting bank instruments?

11. What are the common errors in aircraft pitch during straight-and-level flight?

12. For standard-rate turns, what are your primary and supporting bank instruments?

13. For standard-rate turns, what is your primary pitch instrument?

14. During steep turns, what are your primary instruments for pitch, bank, and power?

NAME: GRADE: _____

Stage 6, Lesson 3 Homework

At the completion of this lesson, the student will: Gain knowledge on errors of the magnetic compass, and demonstrate an understanding of partial panel instrument references as they relate to aircraft control.

READING ASSIGNMENT
OU Supplementary Information for Flight Students
Instrument Flying Handbook – Chapter 5 "Flight Instruments"
Instrument Flying Handbook – Chapter 7 "Airplane Basic Flight Maneuvers"
Jeppesen Instrument/Commercial Chapter 2B

1. Explain the acronyms UNOS, ANDS, and NOSE with regards to magnetic compass errors.

2. When flying on a 100° heading ATC instructs you to make a left turn to a heading of 360°. What heading will you roll out on?

3. You are flying in the northern hemisphere on a 270° heading. If the aircraft is accelerated, what will the magnetic compass normally indicate?

4. As you roll into a standard-rate turn to the left from a southerly heading in the Northern Hemisphere, what should be the indication on the magnetic compass?

5. During straight and level flight with a failed vacuum system, what is your primary bank instrument?

6. What are your pitch and bank instruments for standard rate climbing turns with a failed vacuum system?

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7. What will each instrument of the pitot-static system indicate if the pitot tube becomes clogged?

8. What will each instrument of the pitot-static system indicate if the static port is iced over?

9. Refer to the instrument panel below: What is the aircraft's flight attitude?

10. Refer to the figure above: which system has malfunctioned? What could we do to remedy this?

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Stage 6, Lesson 4 Homework

At the completion of this lesson, the student will: Demonstrate an understanding of more complex partial panel instrument references as they relate to aircraft control, and gain knowledge of IFR flight plans/clearances.

READING ASSIGNMENT

Instrument Flying Handbook – Chapter 5 "Flight Instruments"
Instrument Flying Handbook – Chapter 7 "Airplane Basic Flight Maneuvers"
Instrument Flying Handbook – Chapter 10 "IFR Flight"
FARs: §91.173, §91.169, §91.103

1. What is the correct sequence for recovery from the unusual attitude indicated?

2. From the figure above, which instrument/system has failed?

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3. What pre-flight information must the pilot become familiar with prior to IFR flight?

4. When is an IFR Flight plan necessary?

5. What information must be included in an IFR flight plan?

6. What items are included in an IFR clearance?

7. When does ATC **not** provide traffic separation for an aircraft?

NAME: GRADE: _____

Stage 6, Lesson 5 Homework

At the completion of this lesson, the student will: Gain knowledge on required VOR accuracy tests and demonstrate a more complex understanding of aircraft instruments.

READING ASSIGNMENT
Instrument Flying Handbook – Chapter 5 “Flight Instruments”
Pilots Handbook of Aeronautical Knowledge - Chapter 8 “Flight Instruments”
Instrument Flying Handbook – Chapter 7 “Airplane Basic Flight Maneuvers”
Jeppesen Instrument/Commercial Chapter 2A and 2B
91.171 – VOR equipment check for IFR operations

1. How often must your VOR be tested for accuracy for flight under IFR?

2. What are the 4 methods for conducting and their tolerances for a VOR receiver check?

3. In what publication would you find a published list of VOR checkpoints?

4. What information must you record when completing a VOR check?

5. What component of the attitude indicator will cause the gyro to return to horizontal when it is displaced?

6. When are errors in both pitch and bank on the attitude indicator usually at a maximum?

NAME: GRADE: _____

7. What is the formula to calculate the approximate required bank for a standard-rate turn?

8. How does airspeed affect rate of turn?

9. What information does the miniature aircraft of the turn coordinator directly display?

10. How does magnetic dip affect the magnetic compass?

11. Why does the airspeed indicator use both ram and static air?

12. Given a constant indicated airspeed, how will true airspeed change with an increase in altitude?

13. En route to Raton Municipal Airport (KRTN) in New Mexico, your altimeter is set to 30.14 "Hg. The AWOS at Raton reports a new altimeter setting of 29.94 "Hg. However, you fail to change your Kollsman window. If the instrument approach is designed to be flown to 200 feet AGL, how high/low will you be upon reaching minimums?

NAME: GRADE: _____

Stage 7, Lesson 1 Homework

At the completion of this lesson, the student will: Gain knowledge on the basics of holding pattern procedures.

READING ASSIGNMENT

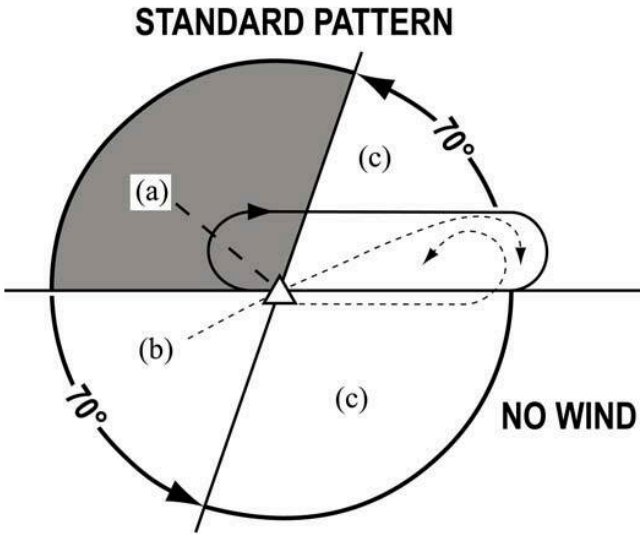
AIM 5-3-8 "Holding"
Instrument Procedures Handbook - Chapter 2 "En Route Operations"
Jeppesen Instrument/Commercial Chapter 5C

1. What is a holding pattern and why would ATC assign one?

2. Draw and label a holding pattern (assume no wind).

3. What are you protected from in the "protected side"/"holding side"?

4. Describe how you would enter the hold when approaching the fix from each sector (a, b, and c)



(a)

(b)

(c)

NAME: GRADE: _____

5. Aircraft are required to hold at the following altitudes and maximum holding airspeeds:

Altitude (MSL)	Max Airspeed (KIAS)

6. Why are maximum holding speeds assigned?

7. When should the pilot begin to slow the aircraft to at or below maximum holding airspeed?

8. If flying a timed hold, how long should your inbound leg be below 14,000' MSL? Above?

9. In which direction are standard turns made in a holding pattern?

10. For holds not involving the use of RNAV lateral guidance, what bank angle should be used during entry and while holding?

NAME: GRADE: _____

Stage 7, Lesson 2 Homework

At the completion of this lesson, the student will: Gain proficiency in drawing holds and determining proper hold entry.

READING ASSIGNMENT
AIM 5-3-8 "Holding"
Instrument Procedures Handbook - Chapter 2 "En Route Operations"
Jeppesen Instrument/Commercial Chapter 5C

1. Hold northeast of the Will Rogers VOR on the 030 radial, 20 DME.

2. Hold northeast of the Will Rogers VOR on the 030 radial, 20 DME, non-standard turns.

3. Hold northwest of the IRW VORTAC 106 radial, at the intersection of the OKM VOR 208 radial.

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4. For the following instructions, also determine how to properly enter the hold:
   Hold southwest of the Will Rogers VOR on the 030 radial, 20 DME, non-standard turns. You are on the 030 radial at 10 DME.

5. Hold east of the Will Rogers VOR on the 090 radial. You are on the 310 radial direct to the station.

6. Hold southwest of the Will Rogers VOR on the 030 radial, 20 DME. You are east of the radial at 28 DME.

7. Hold southwest of the Will Rogers VOR on the 210 radial, 22 DME. Upon tuning the 210 radial, the needle is deflected to the left with a “TO” indication.

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Stage 7, Lesson 3 Homework

At the completion of this lesson, the student will: Gain knowledge on how to properly draw a hold and how to fly DME arcs.

VIDEO ASSIGNMENT

Watch the following video from King Schools titled "DME Arc = Root Canal? (How to Fly One Easily)"
https://www.youtube.com/watch?v=NtVwTOm-OGk

1. When do you start your lead turn from the radial to enter the DME arc?

2. How far will your initial turn be to enter and begin the arc?

3. Using the "Turn 10, Twist 10" method, when do you turn, and when do you twist?

4. When you twist the OBS, what are you twisting to?

5. How do you adjust your arc if you end up too far or too close?

NAME: GRADE: _____

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NAME: GRADE: _____

Stage 7, Lesson 4 Homework

At the completion of this lesson, the student will: Gain knowledge on how winds affect holding patterns.

READING ASSIGNMENT
AIM 5-3-8 “Holding”
Instrument Procedures Handbook - Chapter 2 “En Route Operations”
Jeppesen Instrument/Commercial Chapter 5C

1. Fill in the blank:
   If flying a timed hold below 14,000’ MSL, make the _____ leg be ____ minute(s).

2. How does wind affect the time of the inbound and outbound legs of a holding pattern?

3. Consider the following hold scenarios and explain how to adjust your holding pattern.
   a. You fly your first outbound leg for 1 minute. After turning inbound, it takes 30 seconds to reach the holding fix.

   b. Upon making the above corrections, your inbound leg now takes 47 seconds.

   c. Upon making the above corrections, your inbound leg now takes 1 minute 14 seconds.

4. How does a crosswind affect the holding pattern?

5. Why is it important to correct for a crosswind during a hold?

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6. How do you determine the amount of wind drift correction necessary during the hold?

7. While turning inbound to complete your first hold, you end up overshooting the radial, drifting into the non-protected side.

   Consider the following hold scenarios and explain how to adjust your holding pattern.

   a. On the inbound leg, your heading is 160, but your ground track is 155.

   b. On the inbound leg, your heading is 160, but your ground track is 163.

   c. On the inbound leg, your heading is 160, but your ground track is 140.

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Stage 7, Lesson 5 Homework

At the completion of this lesson, the student will: Gain knowledge on applicable FARs, including logging time, IFR currency and proficiency, safety pilot, and required documents for IFR flight.

READING ASSIGNMENT
FARs: §61.51, §61.57, §91.109
PA-28-181 POH

1. When can you log instrument time?

2. Within the preceding 6 calendar months, recent flight experience must you log to act as PIC under IFR?

3. Can you obtain your IFR currency above using an approved flight simulator (a FFS, ATD, or FTD)?

4. May you use an approved flight simulator during this "grace period"?

5. What are the requirements for having a safety pilot?

6. If flying with a safety pilot, are they required to sign your logbook?

7. 6 calendar months have passed, and you have not met the recent flight experience. What now?

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8. When is an Instrument Proficiency Check (IPC) required?

9. Who can administer an IPC?

10. What are the personal documents required for flight?

11. What are the aircraft documents required for flight?

12. According to the POH, what specific equipment/instruments are required for IFR flight?

NAME: GRADE: _____

Stage 7, Lesson 6 Homework

At the completion of this lesson, the student will: Gain further knowledge on applicable FARs, aircraft inspections, IFR cruise altitudes, IFR fuel requirements, and IFR position reporting.

READING ASSIGNMENT
FARs: §91.167, §91.171, §91.179, §91.207 §91.409, §91.411, §91.413
AIM 5-3-2 "Position Reporting"
AIM 5-3-3 "Additional Reports"

1. How long is the aircraft registration valid for?

2. How long is the aircraft's airworthiness certificate valid for?

3. What maintenance inspections are required for IFR flight?

4. What are the 4 ways to check the VORs, and what are the tolerances for each?

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5. If you owned an American Champion Citabria and hired a flight instructor for your IFR training, are you required to complete a 100-hour inspection?

6. What cruising altitudes are to be used for IFR flight?

7. Under part 91, what are the minimum fuel requirements for flight under IFR?

8. When should position reports to ATC over designated reporting points be provided?

9. When should position reports to ATC over designated reporting points be discontinued?

10. In addition to position reports, what reports should be made to ATC without a specific ATC request?

NAME: GRADE: _____

Stage 7, Lesson 7 Homework

At the completion of this lesson, the student will: Gain knowledge on human factors and risk management.

READING ASSIGNMENT
Instrument Flying Handbook - Chapter 3 “Human Factors”
Jeppesen Instrument/Commercial Chapter 1B
Risk Management Handbook - Chapter 3 “Identifying Hazards & Associated Risks”

1. List each item of the IMSAFE checklist.

2. List each hazardous attitude. Explain why they are hazardous and the antidotes for each.

3. List each item of the PAVE checklist and how it relates to IFR flying.

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4. List each item of the 5Ps checklist and how it relates to IFR flying.

5. Explain Task Management and how we apply it to IFR flying.

6. List each type of Hypoxia. Include an example of when you may encounter them.

NAME: GRADE: _____

Stage 7, Lesson 8 Homework

At the completion of this lesson, the student will: Gain knowledge on vestibular illusions and their effects.

READING ASSIGNMENT

Instrument Flying Handbook - Chapter 3 “Human Factors”
Jeppesen Instrument/Commercial Chapter 1B
AOPA Safety Spotlight - “Tricked by Illusions”

Describe each vestibular and visual illusion and how they occur.

1. The Leans

2. Coriolis Illusion

3. Graveyard Spiral

4. Somatogravic Illusion

5. Inversion Illusion

NAME: GRADE: _____

6. Elevator Illusion

7. False Horizon

8. Autokinesis

NAME: GRADE: _____

Stage 7, Lesson 9 Homework

At the completion of this lesson, the student will: Gain knowledge on the basics of IFR enroute charts and lost comm procedures under IFR.

READING ASSIGNMENT

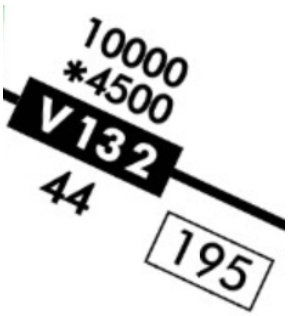
Instrument Procedures Handbook - Chapter 2 "En Route Operations"
Jeppesen Instrument/Commercial - Chapter 5A
§91.185 – IFR operations: Two-way radio communications failure

1. Low altitude enroute charts depict airways below _____ MSL.

2. What are airways published on the low altitude enroute chart called?

3. How are RNAV routes depicted on the low altitude enroute chart?

4. Explain what each of these numbers mean on a low altitude enroute chart



5. What is the MEA, and what does it give you?

6. What is the MOCA, and what does it give you?

NAME: GRADE: _____

7. If in IFR conditions and you experience a two-way radio failure, what procedure should you follow?
    a. Route:

    b. Altitude:

8. What should you do if you experience a two-way radio failure in VFR conditions?

NAME: GRADE: _____

Stage 7, Lesson 10 Homework

At the completion of this lesson, the student will: Demonstrate complex understanding of holding procedures and considerations.

READING ASSIGNMENT
AIM 5-3-8 “Holding”
Instrument Procedures Handbook - Chapter 2 “En Route Operations”
Jeppesen Instrument/Commercial Chapter 5C

Read the following scenarios and do the following: draw the hold, explain the holding entry, applicable holding procedures, the effect of wind, and any other considerations

1. You are going on a XC from KOUN to Waco, TX (KACT) to watch a Baylor football game. Minutes into the flight, ATC informs you of heavy traffic in the DFW area and will need you to enter a holding pattern. **Winds at altitude are 180 and 15 knots. The time is 1300z**. The hold instructions are as follows:

CRIMSON 13, HOLD NORTH OF THE ARDMORE VOR 360 RADIAL, NON-STANDARD TURNS. EXPECT FURTHER CLEARANCE AT 1430 ZULU

   a. Draw the hold

   b. You are passing over Purcell. How will you enter the hold?

   c. How will you know when you reach the holding fix?

   d. How will the wind affect your outbound leg? Which way will you do your wind correction?

   e. What considerations, if any, do you have regarding the EFC time?

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2. You are on a XC to Tulsa (KTUL) to visit the new A-10 "Warthog" display at the Tulsa Air and Space Museum. To be extra safe, you decided to take full fuel for the journey.
   Just as you get inside the class C airspace, Tulsa Approach lets you know a V-tail bonanza landed gear-up at the airport. It will be some time until they can get the runway cleared, and will need you to hold. **Winds are out of the northeast at 25 knots. The time is 1432 CDT**. The hold instructions are as follows:

CRIMSON 18, PROCEED DIRECT TO TULSA VORTAC. HOLD NORTH OF THE TULSA VORTAC AS PUBLISHED. EXPECT FURTHER CLEARANCE AT 2200Z.

   a. Where will you find the published hold?

   b. What radial is the hold off of?

   c. How will you enter the hold?

   d. How will you know when you reach the holding fix?

   e. How will the wind affect your procedure? What will you do about it?

   f. What considerations, if any, do you have regarding the EFC time?

NAME: GRADE: _____

Stage 7, Lesson 11 Homework

At the completion of this lesson, the student will: Demonstrate complex understanding of IFR routes, holding procedures, and applicable considerations.

READING ASSIGNMENT
AIM 5-3-8 “Holding”
Instrument Procedures Handbook - Chapter 2 “En Route Operations”
Jeppesen Instrument/Commercial Chapter 5C

Read the following scenario and answer the accompanying questions.

You made it to the big league! You are a first officer in a brand new Gulfstream G700. Your first assignment is a XC from KOKC to KFSM for a client. You are cleared via the V210 to the OKM VOR, V532 to the FSM VORTAC, then direct. Your **assigned** altitude is **13,000 feet**.

1. What is the MEA along the V210?

2. How long is the V210?

Up at cruise altitude, life is good. You feel pure happiness every time you glance at the airspeed tapes, showing an indicated **airspeed of 325 knots**. The captain is grumbling something about the assigned altitude and company restrictions, but you don’t mind.
After a few minutes, ATC has bad news. There are scattered thunderstorms along your route of flight, and will need you to hold. **The time is 2358 CST. Winds are out of the west at 10 knots**. You hold instructions are as follows:

N700G, HOLD WEST OF THE V210 AT THE MINGG INTERSECTION. EXPECT FURTHER CLEARANCE AT 0100z.

3. Draw the hold

NAME: GRADE: _____

4. How will you enter the hold?

5. Without use of a GPS, how will you identify the fix? Without use of DME?

6. What is the maximum holding speed?

7. If necessary, when should you begin slowing to your maximum holding speed?

8. How will the wind affect your procedure? What will you do about it?

Before your second lap in the hold, ATC instructs you to **climb to 15,000 feet**. At this altitude, the **winds are out of the southwest at 30 knots**

9. Explain any applicable changes to your holding procedures at this new altitude.

10. While in the hold you lose radio communications with ATC. When do you depart the hold? What route will you fly? What altitude? (be specific)

NAME: GRADE: _____

Stage 8, Lesson 1 Homework

At the completion of this lesson, the student will: Gain knowledge on the basics of instrument approach procedures and missed approach procedures.

READING ASSIGNMENT
Instrument Flying Handbook – Chapter 1 "National Airspace System"
Instrument Flying Handbook – Chapter 10 "IFR Flight"
Instrument Procedures Handbook – Chapter 4 "Approaches"
§91.175 – Takeoff and landing under IFR
AIM 5-4-7 "Instrument Approach Procedures"
OU Supplementary Information for Flight Students

1. What is an instrument approach and why would we fly them?

2. What are the different types of instrument approaches?

3. What are the different sections of an FAA instrument approach plate (IAPs)?

4. What are the different segments of an instrument approach and how do we identify them?

5. What is an MDA? What is a DA? What is the difference?

NAME: GRADE: _____

6. When are you allowed to operate below the DA/MDA?

7. What constitutes the 'runway environment'?

8. If you only have the approach light system in sight, are you authorized to land?

9. When would you execute a missed approach procedure?

10. How do you execute a go-around into a missed approach procedure?

11. What airspeed does an aircraft conduct approaches at? What is OU's Procedure for airspeed?

NAME: GRADE: _____

Stage 8, Lesson 2 Homework

At the completion of this lesson, the student will: Gain knowledge on parts of an approach and non-precision approach procedures.

READING ASSIGNMENT
Instrument Procedures Handbook – Chapter 4 "Approaches"
Instrument Flying Handbook – Chapter 10 "IFR Flight"
AIM 5-4-9 "Procedure Turn and Hold-in-lieu of Procedure Turn"
Terminal Procedures Publication

1. What is the difference between a precision approach and a non-precision approach?

2. What is the difference between a Straight-In Approach Procedure and a Circling Approach Procedure?

3. How is the final approach fix (FAF) depicted on an approach plate?

4. What is a course reversal and why would you fly one?

5. What are some different ways a course reversal will be published?

6. What are the various ways to identify a missed approach point (MAP) on a non-precission approach?

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7. When flying a timed approach, how do you determine the time from the FAF to the MAP?

8. Refer to the VOR RWY 17 (KSLN) approach plate. Explain how you would fly the approach starting at HETAB. Include any airspeed and altitude restrictions you may encounter.

9. Refer to the LOC RWY 2 (KASX) approach plate. How would you fly the full procedure from the IAF of GRASS to your missed approach hold?

10. Refer to the LOC BC RWY 17R (KGFK) approach plate. How will navigating this approach be different from the one above?

11. Where is the Missed Approach Point for the approach above? What are some different ways to identify it?

12. If ATC clears you to an initial approach fix (IAF) but does not clear you for the approach, can you descend to your next altitude after crossing the IAF?

13. How else can ATC get you to your final approach fix (FAF) instead of sending you to an IAF?

NAME: GRADE: _____

Stage 8, Lesson 3 Homework

At the completion of this lesson, the student will: Gain knowledge on RNAV and precision approaches, including ILS and LPV approaches.

READING ASSIGNMENT
Instrument Procedures Handbook – Chapter 4 "Approaches"
AIM 1-1-9, 1-2-3, 5-4-5
§91.175 – Takeoff and landing under IFR

1. What is an ILS?

2. What are the components of an ILS?

3. When flying an ILS, what happens to the CDI as you get closer to the runway?

4. How is the final approach fix defined for a precision approach depicted on an approach chart?

5. If there was a NOTAM stating that the glideslope of the ILS was unusable, what would you do?

6. What is RAIM? How many satellites are needed to function? How many if the GPS has fault detection and exclusion (FDE)?

7. What is WAAS and how does it work?

NAME: GRADE: _____

8. For each RNAV minima, state whether or not WAAS is required
    a. LNAV
    b. LNAV/LNAV
    c. LP
    d. LPV
    e. LNAV+V

9. What is the difference between LNAV and LP?

10. What kind of structure do RNAV approaches typically resemble?

11. What is a TAA? What is it for?

12. How do you know which approach minima to use when conducting GPS approaches?

13. For each of the following approach types, label them as either Precision Approach (PA), Approach with vertical guidance (APV), and Non-precision approach (NPA)
    a. VOR
    b. LOC
    c. ILS
    d. RNAV (LNAV)
    e. RNAV (LP)
    f. RNAV (LPV)

14. If you decide to go missed early on an approach, when will you begin climbing and when should you begin making any turns?

NAME: GRADE: _____

Stage 8, Lesson 4 Homework

At the completion of this lesson, the student will: Gain knowledge on controlling the aircraft with inoperative instruments as well as landing from an approach.

READING ASSIGNMENT
Instrument Procedures Handbook – Chapter 4 "Approaches"
PA-28-181 POH

1. Why is it important to verify the IAP has not expired? Can you use an expired IAP?

2. What are the three reasons a circling only approach may exist?

3. Why do instrument approaches that are circling only have 'N/A' for the Rwy ldg and TDZE?

4. When can you descend below the MDA on a circling approach?

5. How do you know if an instrument has failed on your PFD or standby instrument?

6. While performing a procedure turn, what are your primary pitch and bank indications?

7. While on the final approach course with an inoperative DG, what is your primary bank instrument?

NAME: GRADE: _____

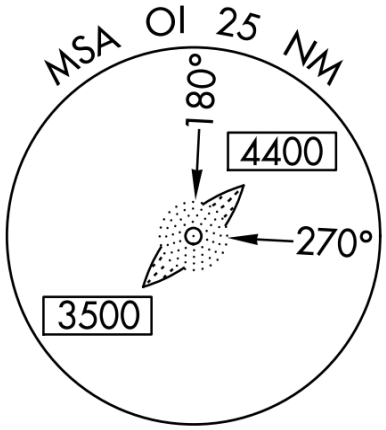
8. Utilizing the Control-Performance method, what are your pitch and power indications during cruise in the 100i?

9. What are your pitch and power indications during climb in the 100i?

10. What are your pitch and power indications during final approach in the 100i?

11. What is an MSA? When is it used?

12. Decode the following MSA



13. What is the MSA centered around?

NAME: GRADE: _____

Stage 8, Lesson 5 Homework

At the completion of this lesson, the student will: Become familiar with different types of approaches and the applicable symbology, notes, details, and procedures.

READING ASSIGNMENT
Instrument Procedures Handbook – Chapter 4 "Approaches"
Terminal Procedures Publication
AIM 1-2-2(a)(1) "Required Navigation Performance (RNP)"
AC 90-105A

FOR THE FOLLOWING QUESTIONS REFERENCE THE 'RNAV (GPS) RWY 9' INTO KEYW

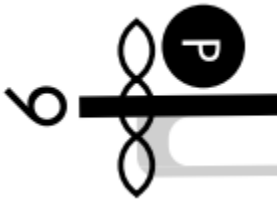
1. What do the following symbols mean in the briefing strip: 
2. Where would you find more about the  into this airport?
3. Why is the plan view of the plate mostly grey?
4. What does the box on the left of the plan view with "W-174B" depict?
5. You are cleared direct to CHETS. Would you fly the published hold?
6. Assuming you are cleared for the approach, what altitude will you be at arriving at CHETS? What airspeed?

NAME: GRADE: _____

7. What is the “V” on the profile view? What does it mean? 

8. What is the MSA for this approach?

9. If the field elevation is 3 feet, why is the MSA 15,000 feet?

10. What does the spiral in the airport diagram indicate? What about the P in a circle? 

11. What is the MAP for the LPV approach?

12. What is the MAP for the LNAV approach?

13. The top of the briefing strips says “RNP APCH-GPS” can we fly this approach?

FOR THE FOLLOWING QUESTIONS REFERENCE THE ‘RNAV (RNP) Z RWY 17R’ INTO KOKC

14. This approach says “RNP AR APCH”. Can we fly this approach?

15. What would we need in order to fly this approach?

NAME: GRADE: _____

Stage 8, Lesson 6 Homework

At the completion of this lesson, the student will: Become familiar with different types of approaches and the applicable symbology, notes, details, and procedures.

READING ASSIGNMENT
Instrument Procedures Handbook – Chapter 4 "Approaches"
Terminal Procedures Publication
AIM 1-1-1 "Navigation Aids"
AIM 5-4-5(a)(7)

FOR THE FOLLOWING QUESTIONS REFERENCE THE 'LDA RWY 34' INTO KFYV

1. What is an LDA approach? What makes it different then a LOC?

2. What makes this specific LDA approach unique?

3. If the 100i GPS was inoperative, could we fly this procedure? Why or why not?

4. What does the  in the middle briefing strip mean?

5. What type of ALS does the approach have?

6. If the ALS was inoperative, what would you do?

NAME: GRADE: _____

7. What is the identifier for the localizer?

8. You are on a XC from the Fort Smith VORTAC. Must you fly the procedure turn? Why or why not?

9. If you were only cleared direct to WATUG, would you fly the procedure turn?

10. If instructed to hold at WATUG, what type of hold would you fly?

11. How would you identify the holding fix?

12. What does the 

at the top of the airport diagram mean? Where would you find more?

13. If you are receiving the LDA with glideslope, what would your minimums be? Is that a DA or MDA?

14. If the glideslope was NOTAM'd unusable, what would your minimums be?

NAME: GRADE: _____

Stage 8, Lesson 7 Homework

At the completion of this lesson, the student will: Become familiar with different types of approaches and the applicable symbology, notes, details, and procedures.

READING ASSIGNMENT
Terminal Procedures Publication
AIM Chapter 7 Section 3
AIM 5-1-3 "Notice to Airmen (NOTAM) System"

FOR THE FOLLOWING QUESTIONS REFERENCE THE 'VOR or TACAN RWY 15' INTO KMTN

1. What is the primary NAVAID for this approach?

2. What is the final approach course?

3. The following NOTAM is issued for this airport. How does it affect the approach?

!MTN 08/223 SVC AUTOMATED WX BCST SYSTEM ALTIMETER SETTING NOT AVBL 2508191717-2903191500EST

4. When is the above NOTAM active and when does it expire?

5. What does the star next to the MARTIN TOWER frequency mean?

6. What is the IAF?

NAME: GRADE: _____

7. You are on the 334 radial of BAL. Upon reaching SLOAF how will you begin the arc?

8. What method will you use to fly the arc?

9. How would you identify CUMBE?

10. Assuming you have been cleared for the approach, what may you do upon reaching CUMBE?

11. What is the FAF? How will you identify it?

12. What is the MAP? How will you identify it?

13. Upon going missed, explain in detail how to navigate to the missed approach hold.

14. On the plan view, what does the box on the right with "R-4001B" indicate?

NAME: GRADE: _____

Stage 8, Lesson 8 Homework

At the completion of this lesson, the student will: Become familiar with different types of approaches and the applicable symbology, notes, details, and procedures.

READING ASSIGNMENT
Terminal Procedures Publication
AIM Chapter 7 Section 3
Foreflight - Cold Temperature Airports

FOR THE FOLLOWING QUESTIONS, REFERENCE THE 'LOC/DME-E' INTO KASE

1. What do the following icons mean on this approach plate: 

2. Where would you find more about the  into this airport?

3. The ATIS is reporting a temperature of -30°C. What would change about the approach if you started from AJAXX

4. What do the different shades of brown on the plan view indicate?

5. When will terrain be depicted on an IAP?

6. Between FIMSO and DOYPE there is an obstacle labeled 9539±. What does the ± mean?

7. Why does one localizer have the shading on the right and the other on the left?

8. What type of approach lighting system is on runway 15?

NAME: GRADE: _____

9. Why does this chart require 'Dual VHF Navigation Receivers"?

10. How would you identify the FAF?

11. How would you identify the MAP?

NAME: GRADE: _____

Stage 8, Lesson 9 Homework

At the completion of this lesson, the student will: Become familiar with different types of approaches and the applicable symbology, notes, details, and procedures.

READING ASSIGNMENT
AIM 1-1-9 "Instrument Landings System (ILS)"
Terminal Procedures Publication
AIM 1-2-3

FOR THE FOLLOWING QUESTIONS, REFERENCE THE 'ILS RWY 13' INTO KSUX

1. What ALS does this approach have?

2. Does the ALS include sequencing flashing lights?

3. If the ALS was inoperative, how would you adjust the LOC approach? ILS approach?

4. You are flying from the south, and cleared for the approach from TOMMI. Describe how you will fly the procedure turn.

5. How far from TOMMI must you be during the procedure turn?

6. Where is the FAF for the LOC?

NAME: GRADE: _____

7. Where is the FAF for the ILS?

8. What is the "V" on the profile view? What does it mean? 

9. Where is the MAP on the ILS?

10. On glideslope, how high will you cross the threshold?

11. Where is the MAP on the LOC? How will you identify it?

12. At the top of the profile view it says "VGSI and ILS glidepath not coincident". What does this mean?

13. After crossing the FAF, you lose glideslope indications. Explain what you will do, where you will go, and when.

14. In the notes section it says ADF is required. Can we fly this procedure in the 100i?

NAME: GRADE: _____

Stage 9, Lesson 1 Homework

At the completion of this lesson, the student will: Gain knowledge on departure , enroute, and arrival procedures with respect to IFR.

READING ASSIGNMENT
AIM 5-1-6 “Flight Plan — IFR Flights”
Terminal Procedures Publication
PA-28-181 POH Section 5 “Performance”
AIM 5-3-1 “ARTCC Communications”

1. What must you do in order to act as PIC on an IFR flight?

2. What preflight information is required before IFR flight?

3. What instruments/equipment are required for IFR flight?

4. What are the two types of departure procedures?

5. What are the two types of ODP?

6. If you are not assigned an ODP, can you still fly one?

NAME: GRADE: _____

7. There is no departure procedure published for your departure airport, how will you guarantee you will not hit any obstacles?

8. How can you determine if your aircraft meets the climb gradient for a departure procedure?

9. If you are unable/do not want to fly a departure procedure, what do you put in the remarks section of the flight plan?

10. What climb rate does ATC expect you to maintain to your assigned cruising altitude?

11. What routes are used for enroute navigation below 18,000? Above 18,000?

12. Can you deviate from your assigned course or altitude when on an IFR cross country?

13. Why might you see a localizer on the enroute chart?

14. What is a STAR and what purpose does it serve?

NAME: GRADE: _____

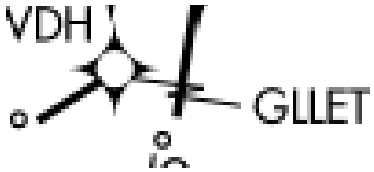
Stage 9, Lesson 2 Homework

At the completion of this lesson, the student will: Gain understanding of various chart symbology and knowledge on alternate planning

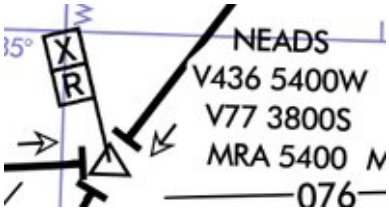
READING ASSIGNMENT

AIM 5-1-6 “Flight Plan — IFR Flights”
AIM 1-1-17(b)(5), 1-1-18(c)(9)
Jeppesen Instrument/Commercial Chapters 4, 5, and 6

1. What does the ‘lightning bolt’ on departure plates depict?

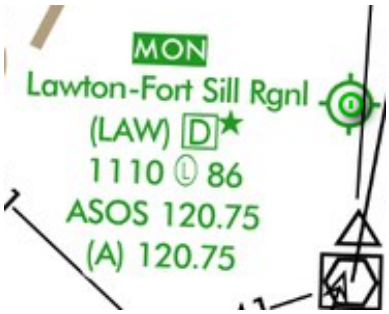


2. What do the ‘X' and ‘R’ flags mean on the enroute chart as depicted?

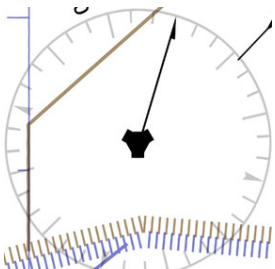


3. If the next leg requires a higher MEA, would you change altitude prior to crossing the fix of after? What if your next MEA is lower?

4. What does the ‘MON’ mean? Describe what system it's tied into.

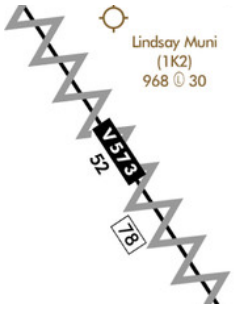


5. What does it mean when the VORTAC is filled in black?



NAME: GRADE: _____

6. What do the grey lines over the V573 mean?



7. When must you file an alternate?

8. For filling purposes, what are the standard alternate minimums? How will you know if non-standard alternate minimums exist?

9. If you are non-WAAS GPS equipped, what considerations should you have with regards to alternate planning?

10. What if you are WAAS equipped?

11. Once you are in the air, what minimums do you need to proceed to the filled alternate?

NAME: GRADE: _____

Stage 9, Lesson 3 Homework

At the completion of this lesson, the student will: Gain knowledge on weather and weather products as applicable for FIR flight.

READING ASSIGNMENT

Pilot's Handbook of Aeronautical Knowledge - Chapter 12 "Weather Theory"
Aviation Weather Handbook - Chapter 2
Jeppesen Instrument/Commercial - Chapter 9

1. What are the three different types of weather briefings? When would you get each?

2. What is the difference between an AWOS, ASOS, and ATIS?

3. How often is the ATIS updated?

4. What is stability of an airmass?

5. How can you determine whether an airmass is stable or unstable?

6. What are the characteristics of stable and unstable air?

7. What are the different types of fronts?

NAME: GRADE: _____

8. What 3 things can you expect from the passage of any front?

9. What are the key ingredients for a thunderstorm?

10. What are the three stages of a thunderstorm and what are each of them characterized by?

11. When approaching a thunderstorm, how far should you stay away from it?

12. Where can windshear associated with a thunderstorm be found?

13. What are SLD (super cooled large drops) and how does it form?

14. Give the issue times, valid times, and associated conditions for each:
    a. AIRMET

    b. SIGMET

    c. Convective SIGMET

NAME: GRADE: _____

Stage 9, Lesson 4 Homework

At the completion of this lesson, the student will: Gain knowledge on IFR emergencies and appropriate actions.

READING ASSIGNMENT
Jeppesen Instrument/Commercial - Chapter 10A
91.187

1. What is the difference between “Urgency” and “Distress”?

2. When should you make a malfunction report to ATC?

3. What information should be included in a malfunction report?

4. You are flying an RNAV arrival and an RNAV approach. You lose your VOR receiver. Do you have to report that to ATC?

5. What is ‘minimum fuel’ and when would you need to declare it?

6. If in IFR conditions and you experience a two-way radio failure, what procedure should you follow?
    a. Route:

    b. Altitude:

NAME: GRADE: _____

7. What should you do if you experience a two-way radio failure in VFR conditions?

8. If you lose your gyroscopic instruments in IMC, what can you use to shoot an approach and land safely?

9. What should you do in the 100i if you encounter icing?

10. What are the oxygen requirements for an unpressurized aircraft?

11. What should you do upon encountering hypoxia?

NAME: GRADE: _____

Stage 9, Lesson 5 Homework

At the completion of this lesson, the student will: Gain the ability to combine all knowledge covered in previous homeworks in preparation for the practical test.

READING ASSIGNMENT
All prior references
Read the following scenarios and answer the questions

You are planning a XC from **KOUN to KIXD**. You are **departing on February 6th at 1800 CST**. With the current weather, you calculate it should be **2 hours and 45 minutes en route.**

1. What information are you required to review during the preflight planning?

2. You want to file a departure procedure out of KOUN. Which departure should you file for? Explain whether or not you can meet all minimums.

3. What routes could you file while en route?

4. You decide to file an arrival. Which procedure should you use? What equipment is required?

5. Read the following TAF for KIXD. Will you need to file an alternate? Explain your reasoning.
   KIXD 062320Z 0700/0724 01006KT P6SM BKN060 BKN120
   TEMPO 0703/0705 4SM BR FG SCT005 BKN010CB
   FM0712 32012KT P6SM OVC060

6. Based on the above TAF, which approach should you plan on using?

NAME: GRADE: _____

7. In the 100i, could you use KFSK as an alternate? The KSK TAF is reporting **5 miles visibility** and **700 foot ceilings.**

8. During the preflight, the Kollsman window of your altimeter will not adjust properly. Are you able to fly?

9. You notice the VORs were last checked on January 10th. Can you fly? Explain why or why not.

10. If you wanted to check your VORs, explain how you would do that.

11. What does it mean if ATC clears you to a fix and then to "climb via" the departure?

12. Approaching KIXD, approach gives the following hold instructions. Explain how you will fly the hold.
CRIMSON 18 HOLD AT JHAWK AS PUBLISHED. EXPECT FURTHER CLEARANCE AT 0245Z

13. You report reaching JHAWK for the hold, but the radios are dead silent. What is likely going on? Explain the procedure you will follow.

14. You decide to proceed to your alternate airport. The weather at the alternate airport is reporting 500' ceilings. Can you continue to the airport and start an approach?