University of Oklahoma
Department of Aviation

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. In order to adequately prepare for each lesson, you are expected to complete the homework assignment before you come to fly. The maximum grade you may receive for an individual flight lesson if you fail to turn in your homework is a **70%**.

What you should bring to each flight lesson:

- Completed homework
- Completed weight and balance
- Syllabus ticket for that lesson
- Medical, photo ID and logbook

STAGE 6, LESSON 1
READING ASSIGNMENT
14 CFR 91.205(d) – Instrument and Equipment Requirements for IFR Flight
Instrument Flying Handbook – Chapter 5 "Flight Instruments"
Warrior POH – Section 7 "Airplane Systems"

STUDY QUESTIONS

1. What equipment, in addition to that required for VFR flight, is required for IFR flight?

2. Which instruments are gyroscopically driven?

3. Which instruments operate off of the pitot-static system?

4. A blocked static port will affect which instruments?

5. Briefly describe acceleration error in a magnetic compass.

STAGE 6, LESSON 2
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 5 "Flight Instruments"
Aeronautical Information Manual – Chapter 4, Section 6 "Procedures for RVSM"

STUDY QUESTIONS

1. What is RVSM and what altitudes does RVSM apply to?

2. How frequently must the altimeter and static system be inspected?

3. During taxi turns, what pre-flight observation should be made of the turn coordinator to ensure proper functioning?

4. What preflight observations should be made of the heading indicator to ensure proper functioning?

5. What preflight observations should be made of the attitude indicator to ensure proper functioning?

STAGE 6, LESSON 3
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 6 “Airplane Attitude Instrument Flying”
Instrument Flying Handbook – Chapter 7 “Airplane Basic Flight Maneuvers”

STUDY QUESTIONS

1. Define the following terms:

   Cross-check

   Fixation

   Omission

   Emphasis

   Interpretation

STAGE 6, LESSON 4
READING ASSIGNMENT
FAR 61.57 Recent Flight Experience
Instrument Flying Handbook – Chapter 7 "Airplane Basic Flight Maneuvers"

STUDY QUESTIONS

1. What are your recent flight experience requirements to act as PIC on an IFR flight?

2. What is the definition of an unusual attitude?

3. What is the recovery procedure for a nose-high, airspeed decreasing unusual attitude?

4. What is the recovery process for a nose-low, increasing airspeed unusual attitude?

5. List 5 common errors that can lead to the onset of an unusual attitude.

STAGE 6, LESSON 5
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 3 "Human Factors"

STUDY QUESTIONS

1. Describe the following vestibular illusions and what you can do to avoid them.

   Leans

   Somatogravic Illusion

   Elevator Illusion

   Inversion Illusion

   Graveyard Spiral

STAGE 7, LESSON 1
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 10 "IFR Flight"
Aeronautical Information Manual - Chapter 5-3-8 "Holding"

STUDY QUESTIONS

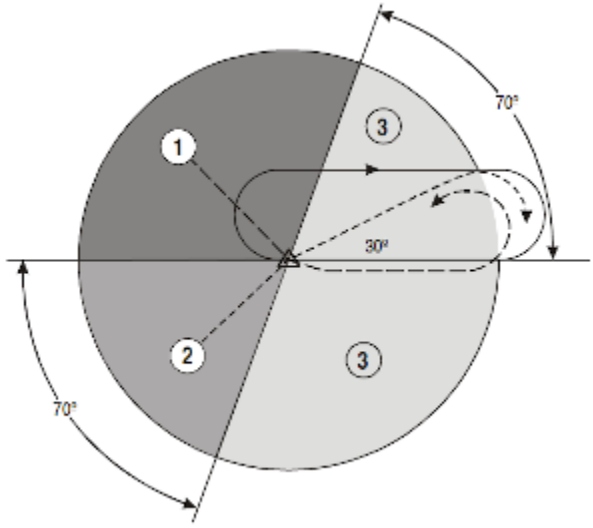
1. Aircraft may hold at the following altitudes and maximum holding airspeeds:

Altitude (MSL)	Max Airspeed (KIAS)

2. Draw and label a standard holding pattern in a no wind situation.

3. How long (in minutes) should you aim for your inbound leg to be if you are holding at or below 14,000 MSL? Above 14,0000 MSL?

4. Describe how you would enter the hold when approaching the fix from each sector (1, 2 and 3).



Sector 1:

Sector 2:

Sector 3:

STAGE 7, LESSON 2
READING ASSIGNMENT
Aeronautical Information Manual - Chapter 5-3-8 “Holding”
Aeronautical Information Manual - Chapter 5-3-2 “Position Reporting”
Aeronautical Information Manual - Chapter 5-3-3 “Additional Reports”

STUDY QUESTIONS

1. You have been cleared to a fix other than the destination airport. If no holding pattern is charted and no holding instructions have been issued before you reach the fix, what should you do?

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

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

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

At all times:	When not in radar contact:
1.	1.
2.	
3.	2.
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	

STAGE 7, LESSON 3
READING ASSIGNMENT
Aeronautical Information Manual - Chapter 5-3-8 “Holding”

STUDY QUESTIONS
Draw the following holds (assuming no wind).

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 southwest of the Will Rogers VOR on the 030 radial, 20 DME.

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

5. Hold east of the Will Rogers VOR on the 090 radial.

6. Hold southwest of the Will Rogers VOR on the 210 radial, 10 DME.

STAGE 7, LESSON 4
READING ASSIGNMENT
Aeronautical Information Manual – Section 2 “Departure Procedures”

STUDY QUESTIONS

1. What is a clearance void time?

2. What does the term “hold for release” mean?

3. What is an “EDCT”?

4. What does the term “Line up and wait” authorize you to do?

STAGE 7, LESSON 5
READING ASSIGNMENT
Aeronautical Information Manual – 5-1-3 "Notice to Airmen System"
Table 5-1-1
Table 5-1-2

STUDY QUESTIONS
Decode the following NOTAMS.

1. DFW TWY A BTN APCH END RWY 13R AND TWY A2 CLSD 1611291348-1611292359

2. DFW RWY 13L/31R CL MARKINGS OBSC 1611212145-1612312359

3. MCI RWY 19L ALS OUT OF SERVICE 1611081818-1612191800EST

4. MCI RWY 09/27 CLSD 1608211858-1612312300

5. TUL TWY L1 HLDG PSN MARKINGS REMOVED 1611251858-1612022130

STAGE 7, LESSON 6
READING ASSIGNMENT
STUDY QUESTIONS

For this lesson, complete the AOPA “GPS for IFR Operations” online course and bring the completion certificate to your flight instructor.

STAGE 7, LESSON 7
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 9 "Navigation Systems"
Aeronautical Information Manual – Chapter 1-1-4 "VOR Receiver Check"

STUDY QUESTIONS

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

2. What are 3 methods for conducting a VOR receiver check?

    a.

    b.

    c.

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

4. What is the acceptable tolerance for conducting a dual VOR receiver check?

STAGE 7, LESSON 8
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 9 "Navigation Systems"
Aeronautical Information Manual – Chapter 1-1-8 "Air Navigation"

STUDY QUESTIONS

1. List the three classes of VORs and their respective service volumes.

Class	Service Volume

2. What are the four components of an ILS system?

   a.

   b.

   c.

   d.

STAGE 7, LESSON 9
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 5 “Flight Instruments”

STUDY QUESTIONS

1. What is TIS and how does it work?

2. What is TCAS and how does it work?

3. What is GPWS and how does it work?

4. What is TAWS and how does it work?

5. What is ADS-B and how does it work?

STAGE 7, LESSON 10
READING ASSIGNMENT
14 CFR 91.211
Instrument Flying Handbook – Chapter 5 "Flight Instruments"

STUDY QUESTIONS

1. Describe supplemental oxygen requirements for unpressurized aircraft.

2. What is a PFD and what type of information does it typically display?

3. What is an MFD and what type of information does it typically display?

STAGE 7, LESSON 11
READING ASSIGNMENT
Aeronautical Information Manual - Chapter 7-1-31 “ICAO Weather Formats”

STUDY QUESTIONS

1. Within a METAR, what do the following precipitation codes mean?

    a. RA _____

    b. PL _____

    c. GR _____

    d. DZ _____

    e. SN _____

2. Within a METAR, what do the following obstruction to visibility codes mean?

    a. FG _____

    b. HZ _____

    c. VA _____

    d. BR _____

    e. DU _____

STAGE 8, LESSON 1
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 1 “National Airspace System”
Instrument Procedures Handbook – Chapter 4 “Approaches”

STUDY QUESTIONS

1. What does the pilot briefing section of an instrument approach chart provide?

2. What does the plan view of an instrument approach chart provide?

3. What does the profile view of an instrument approach chart provide?

4. Where should you look to see how approach minimums may be affected by inoperative approach lights?

STAGE 8, LESSON 2
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 10 "IFR Flight"
Instrument Procedures Handbook – Chapter 4 "Approaches"

STUDY QUESTIONS

1. Pilots may not operate an aircraft below the authorized MDA or continue an approach below the DA/DH unless what three conditions exist:

    a.

    b.

    c.

2. List the elements that are considered part of the "Runway environment"?

    a.

    b.

    c.

    d.

    e.

    f.

    g.

    h.

    i.

    j.

3. Pilots should immediately execute the missed approach procedure if:

    a.

    b.

    c.

STAGE 8, LESSON 3
READING ASSIGNMENT
14 CFR 91.167
14 CFR 91.103
Instrument Procedures Handbook – Chapter 1 “Departure Procedures”
Instrument Procedures Handbook – Chapter 4 “Approaches”

STUDY QUESTIONS
HOMEWORK ASSIGNMENTS

1. What is your legal fuel requirement for IFR flight?

2. When must an alternate airport be listed on your IFR flight plan?

3. What standard alternate minimums must exist for an airport to be legally filed as an alternate? At what time must those conditions exist?

4. What preflight action are you required to perform, as outlined in 14 CFR 91.103?

STAGE 8, LESSON 4
READING ASSIGNMENT
Instrument Procedures Handbook – Chapter 4 "Approaches"
Aeronautical Information Manual – Section 5-4-7 "Instrument Approach Procedures"
Instrument Flying Handbook – Chapter 1 "National Airspace System"

STUDY QUESTIONS

1. List the applicable speeds for each aircraft approach category below:

    a. Category A _____ KIAS
    b. Category B _____ KIAS
    c. Category C _____ KIAS
    d. Category D _____ KIAS
    e. Category D _____ KIAS

2. How is the specific approach speed category for an aircraft determined?

3. A typical approach speed for the Piper Warrior is 90 KIAS. What approach Category does the Warrior belong to?

4. If your normal approach speed in the Warrior is 90 KIAS, but you are performing a circle-to-land maneuver at 100 KIAS, which approach category minimums should you use?

STAGE 8, LESSON 5
READING ASSIGNMENT
14 CFR 91.175
Instrument Procedures Handbook – Chapter 4 “Approaches”
Instrument Flying Handbook – Chapter 1 “National Airspace System”
Aeronautical Information Manual – Chapter 7-1-15 “Runway Visual Range”

STUDY QUESTIONS

1. What is RVR?

2. Convert the following RVR values to a statute mile equivalent.

   1,600 _____

   2,400 _____

   5,000 _____

   6,000 _____

3. What standard takeoff visibility minimums apply for aircraft operating under Part 135 and Part 121? Do these minimums apply if you are operating under Part 91?

STAGE 8, LESSON 6
READING ASSIGNMENT
Instrument Procedures Handbook – Chapter 4 “Approaches”
Aeronautical Information Manual – Section 5-4-5 “Instrument Approach Procedure Charts”
Instrument Flying Handbook – Chapter 1 “National Airspace System”

STUDY QUESTIONS

1. Minimum Sector Altitudes are published for _____ use on IAP charts.

2. MSA’s provide how much clearance above an obstacle? What do MSA’s not assure you of?

3. What is a VDP and how is it displayed on an instrument approach procedure chart?

4. If a VDP is displayed on your IAP chart, you should not descend until:

5. If you are not equipped to identify the VDP, how should you fly the approach?

STAGE 8, LESSON 7
READING ASSIGNMENT
Aeronautical Information Manual – Section 5-4-5(k) "(RNAV) Instrument Approach Charts"
Aeronautical Information Manual – Section 5-4-9 "Procedure Turn and Hold-in-Lieu of PT"
Instrument Flying Handbook – Chapter 1 "National Airspace System"

STUDY QUESTIONS

1. Define the following terms:

   LPV

   LNAV/VNAV

   LP

   LNAV

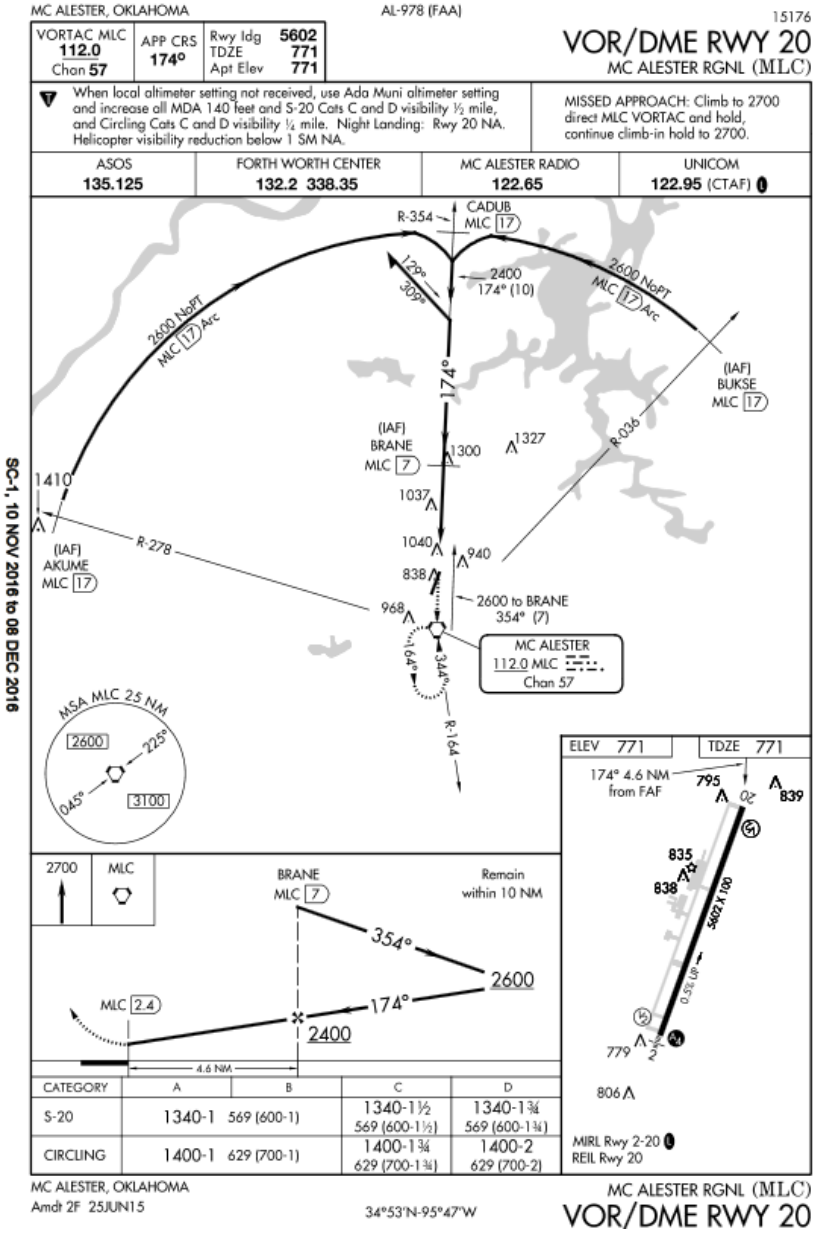
2. Which of these approach minimums requires WAAS to be able to fly?

3. What is a procedure turn?

4. What does it mean if a procedure turn barb is not depicted in the plan view of an IAP?

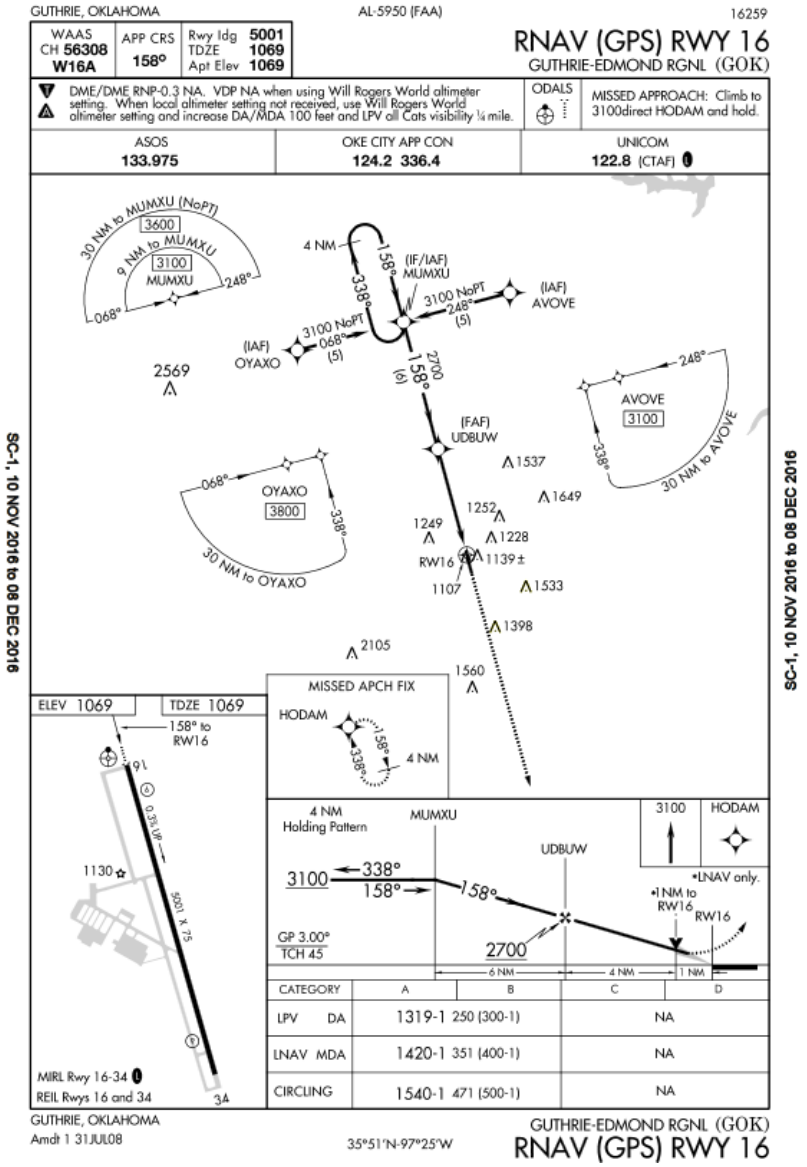
STAGE 8, LESSON 8
STUDY QUESTIONS

1. Where is the final approach fix for this approach? _____
2. Where is your missed approach point? _____
3. What is the MDA for the straight in approach? _____
4. What NAVAID is the MSA for this approach based on? _____
5. When should you descend to 2600 if performing the procedure turn? _____



STAGE 8, LESSON 9
STUDY QUESTIONS

1. If flying this approach using LPV minimums, where is your MAP? _____
2. If flying this approach using LNAV minimums, where is your MAP? _____
3. How would you identify arrival at the MAP? _____
4. How do you activate the missed approach procedure within the G430? _____
5. If you have to use the Will Rogers altimeter, what is your new LPV DA? _____



STAGE 9, LESSON 1
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 10 "IFR Flight"
Instrument Procedures Handbook – Chapter 2 "Enroute Operations"

STUDY QUESTIONS
HOMEWORK ASSIGNMENT

1. List 2 ways you can cancel your IFR flight plan if landing at a non-towered airport.

    a.

    b.

2. How far in advance should you file an IFR flight plan prior to your expected departure time?

3. Define the following terms:

    a. MEA

    b. MOCA

    c. OROCA

    d. MAA

    e. MRA

    f. MCA

STAGE 9, LESSON 2
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 11 "Emergency Operations"

STUDY QUESTIONS

1. List and describe the four rates of ice accumulation you should use when reporting icing conditions to ATC.

    a.

    b.

    c.

    d.

2. In the event of a complete radio failure, what procedure should you follow with regard to route and altitude that should be flown?

    a. Route:

    b. Altitude:

3. If in VMC conditions when you experience a radio failure, what should you do?

4. How would you recognize a failure of your alternator in the Warrior III and what risk would this hazard would pose?

STAGE 9, LESSON 3
READING ASSIGNMENT
Instrument Flying Handbook – Chapter 1 “National Airspace System”

STUDY QUESTIONS

1. How often are low enroute charts updated?

2. What altitudes are low enroute charts valid for?

3. How is Class C and Class D airspace depicted on a low enroute chart?

4. What is the difference between a green airport symbol and a brown airport symbol on the low enroute chart?

5. Explain the difference in how a MOA is depicted on a VFR sectional compared to how it is depicted on a low enroute chart.

6. How are all other types of special use airspace depicted on a low enroute chart? (prohibited areas, restricted areas, etc).

STAGE 9, LESSON 4
READING ASSIGNMENT
Aeronautical Information Manual - Chapter 7-1-20 "Pilot Weather Reports"

STUDY QUESTIONS

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DAY UA /OV AOH/TM 2113/FL166/TP B737/TB MOD CHOP/RM 145-165 DURGD
DAY UA /OV DQN140040/TM 2114/FL120/TP E45X/TA M14/IC LGT RIME
CMH UA /OV GUNNE/TM 2120/FL110/TP B737/TB LGT MOD CHOP
CVG UA /OV CVG320020/TM 2128/FL135/TP J328/TB MOD/RM 135-165 DURGC
CMH UA /OV APE360020/TM 2144/FL110/TP C421/TA M5/TB MOD/IC NEG
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1. What is the difference between a "UUA" and "UA" PIREP?

2. What air temperature did the crew of the Cessna 421 report in their PIREP?

3. What does "DURGD" mean in the 737's PIREP at 2113Z?

4. Between what altitudes did the J328 experience turbulence? What was the intensity of the turbulence it reported?

STAGE 9, LESSON 5
READING ASSIGNMENT
Refer to the excerpt below, from the "ALTERNATE MINS" section of a Terminal Procedures Publication.

NORMAN, OK
UNIVERSITY OF OKLAHOMA
WESTHEIMER (OUN)..... **ILS or LOC Rwy 18[12]**
LOC Rwy 3[13]
RNAV (GPS) Rwy 3[3]
RNAV (GPS) Rwy 18[3]
RNAV (GPS) Rwy 36[3]
NA when local weather not available.
[1]NA when control tower closed.
[2]ILS, Categories A, B, 700-2; Category C, 800-2¼; Category D, 800-2½; LOC, Category C, 800-2¼; Category D, 800-2½.
[3]Category C, 800-2¼; Category D, 800-2½.

STUDY QUESTIONS

1. You are planning an IFR flight from TUL to OKC and would like to use Norman as a potential alternate airport for your IFR flight plan. If the AWOS is out of service, can you legally file OUN as an alternate for your flight?

2. The control tower closes at 2200 Local and based upon the weather forecasts, you anticipate using the LOC 3 if you have to divert to OUN. Can you legally file OUN as an alternate if your ETA is 2230?

3. If the control tower is open and local weather is available, what weather must be forecast at your ETA for you to legally file OUN as an alternate if you are planning to fly the ILS 18?

4. You file OUN as an alternate and depart TUL for OKC. You go missed approach at OKC and decide to divert to OUN – what minimums do you use to fly the approach at OUN?