Revised: January 2025

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

SUPPLEMENTARY INFORMATION

FOR
FLIGHT STUDENTS

This pamphlet provides information to assist flight students in learning standardized procedures at the University of Oklahoma Aviation Department and guidance on performing procedures and maneuvers that are a part of flight training.

Revisions

May 2024

1. Removed references of Cessna Aerobat
2. Adapted procedures to include Piper 100i
3. Updated “references” sections to latest publications
4. Updated FRAT sheet
5. Updated diversion checklist
6. Removed procedures regarding old equipment in instrument flying sections
7. Added cover page and footer
8. Various spelling/grammatical errors fixed

July 2024

1. Clickable table of contents
2. Removed references of Crm 21

TABLE OF CONTENTS

Table of Contents

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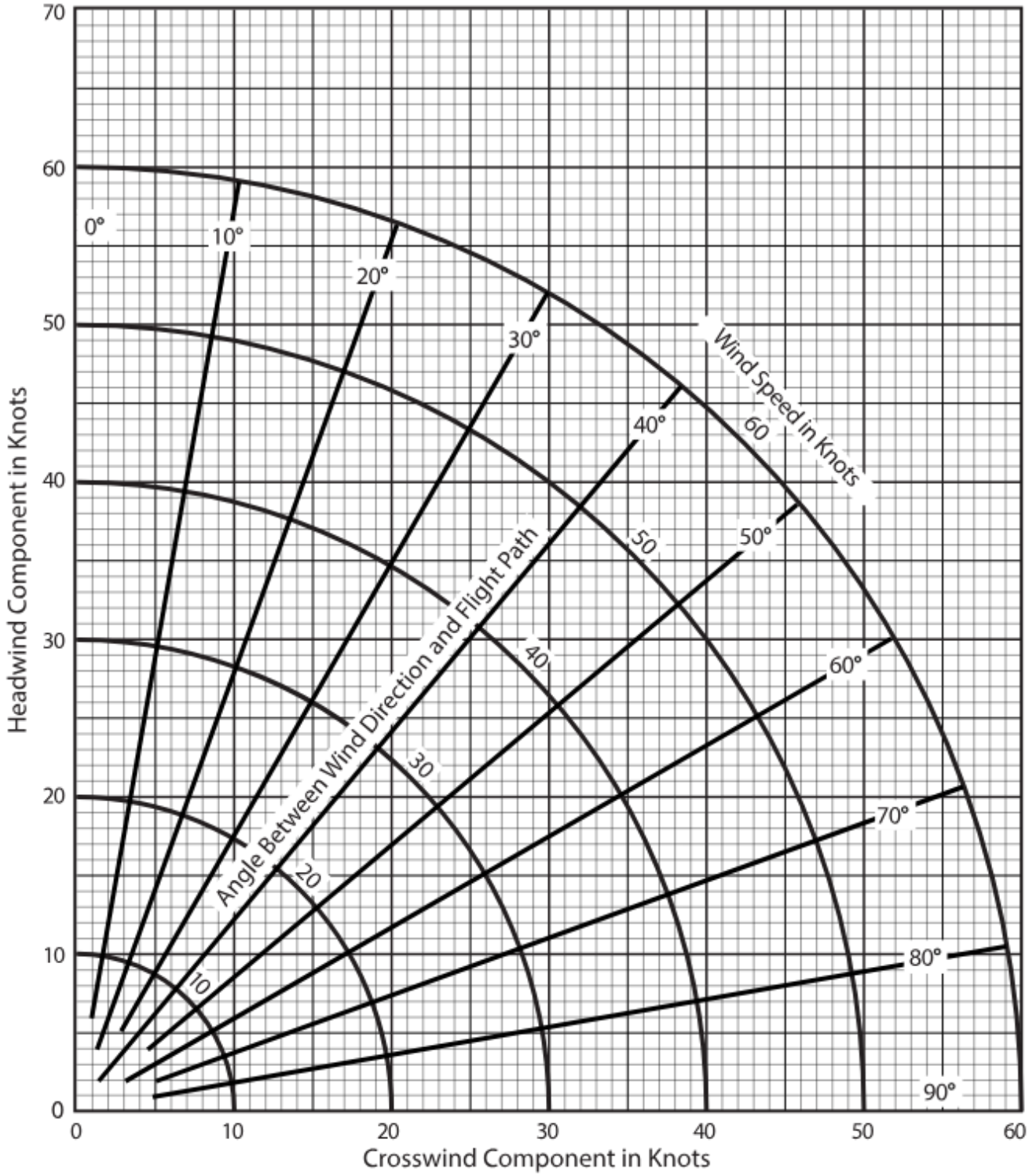
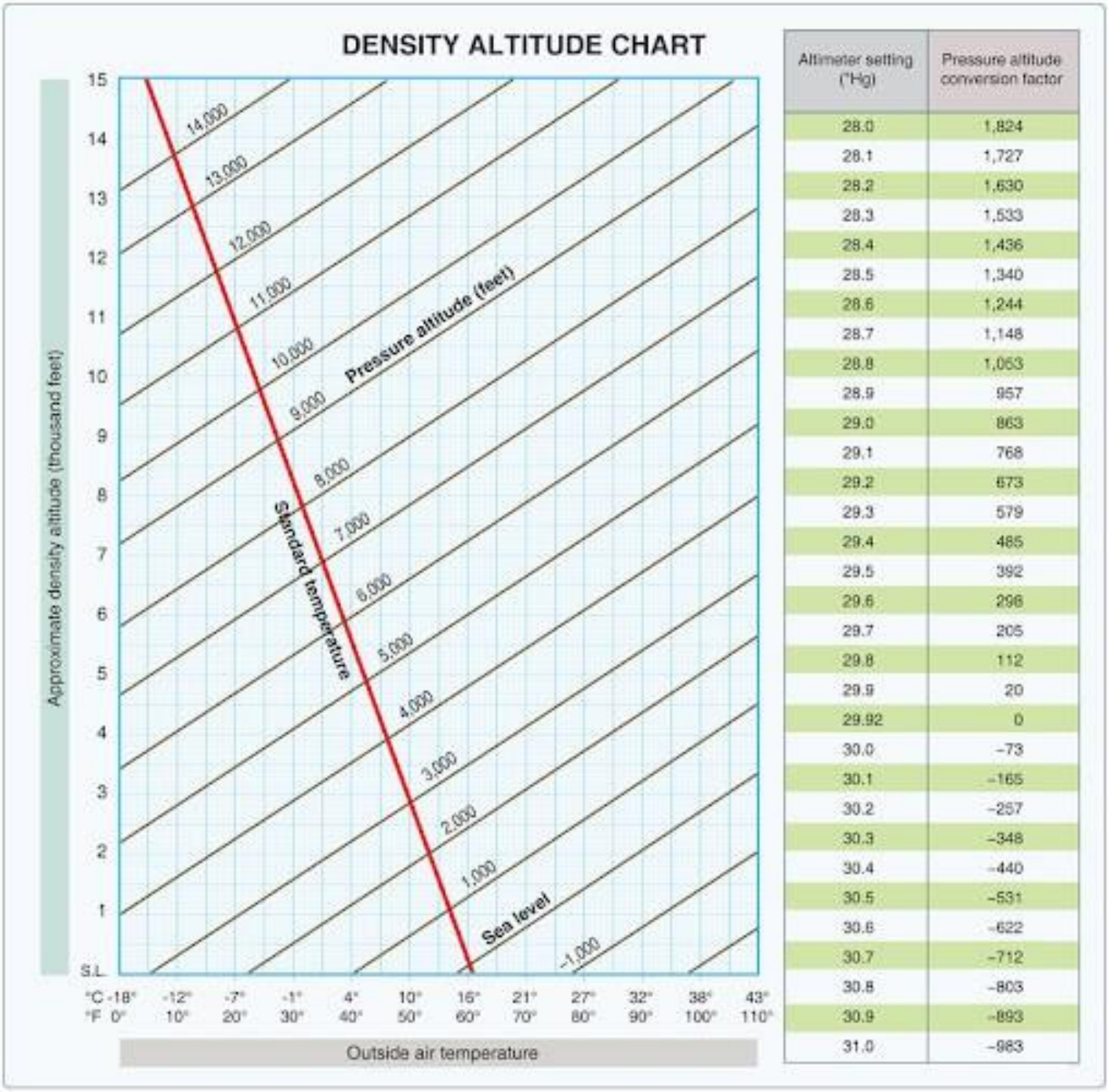
Section 1: Attachments

Crosswind Components Computer

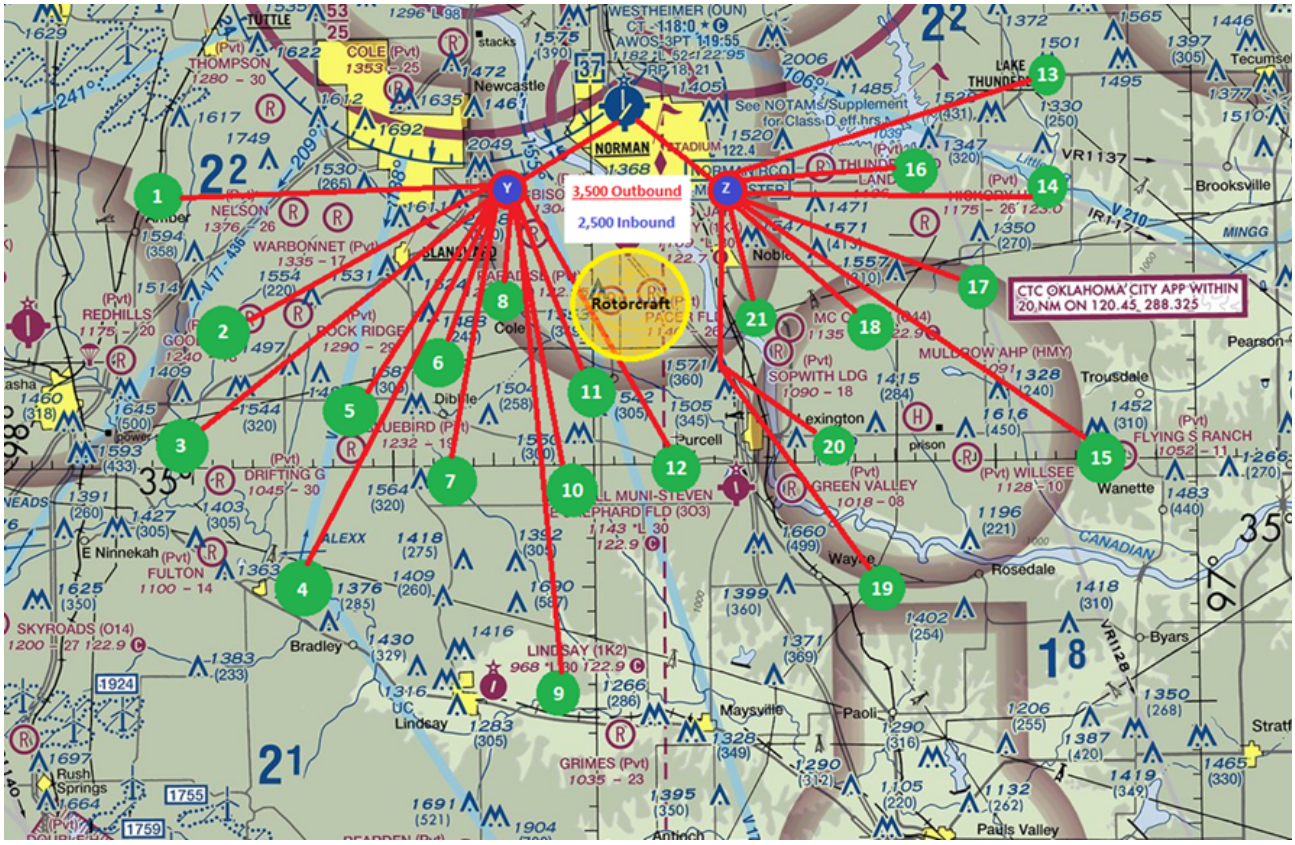


Density Altitude Chart



Altimeter setting ("Hg)	Pressure altitude conversion factor
28.0	1,824
28.1	1,727
28.2	1,630
28.3	1,533
28.4	1,436
28.5	1,340
28.6	1,244
28.7	1,148
28.8	1,053
28.9	957
29.0	863
29.1	768
29.2	673
29.3	579
29.4	485
29.5	392
29.6	298
29.7	205
29.8	112
29.9	20
29.92	0
30.0	–73
30.1	–165
30.2	–257
30.3	–348
30.4	–440
30.5	–531
30.6	–622
30.7	–712
30.8	–803
30.9	–893
31.0	–983

Practice Area Procedures and Identification



OU Departure / Arrival Procedures

- **<u>Outbound Traffic</u>**:
  - Contact tower and advise direction of flight (Southeast for checkpoints 13-21, Southwest for checkpoints 1-12)
  - After takeoff, fly to waypoint Y or Z, per your training checkpoint assignment. Tower will assign a departure turn appropriate for your direction of flight.
  - Tower should give you a hand off to OKC approach (North flow 133.6 South flow 120.45)
  - Approach should give you a switch to Advisory frequency (123.3)
  - On departure, climb to 3,500 MSL and proceed from waypoint Y or Z directly to your assigned training area.
- **<u>Inbound Traffic</u>**:
  - Complete "In-Range Checklist" and contact OKC approach prior to leaving your assigned training area.
  - Initial contact should include aircraft identification, position relative to OUN, and intentions. (i.e. "inbound for landing")
  - proceed inbound to OUN at 2,500 MSL at this time and OKC approach will hand you off to OUN tower
  - This increases aircraft separation with departing traffic.

Checkpoint Identification

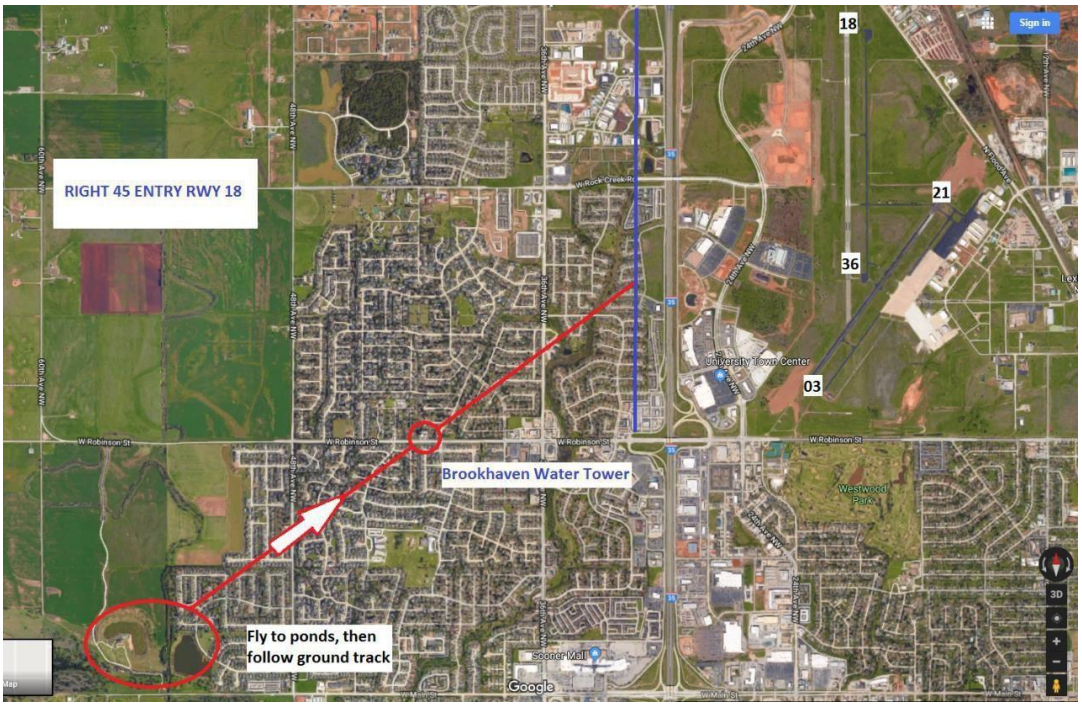
- Routing Checkpoints:
- - Y = Highway 9 and May Ave (White Water Tower)
- - Z = “Postal Training Center”

Training Checkpoints

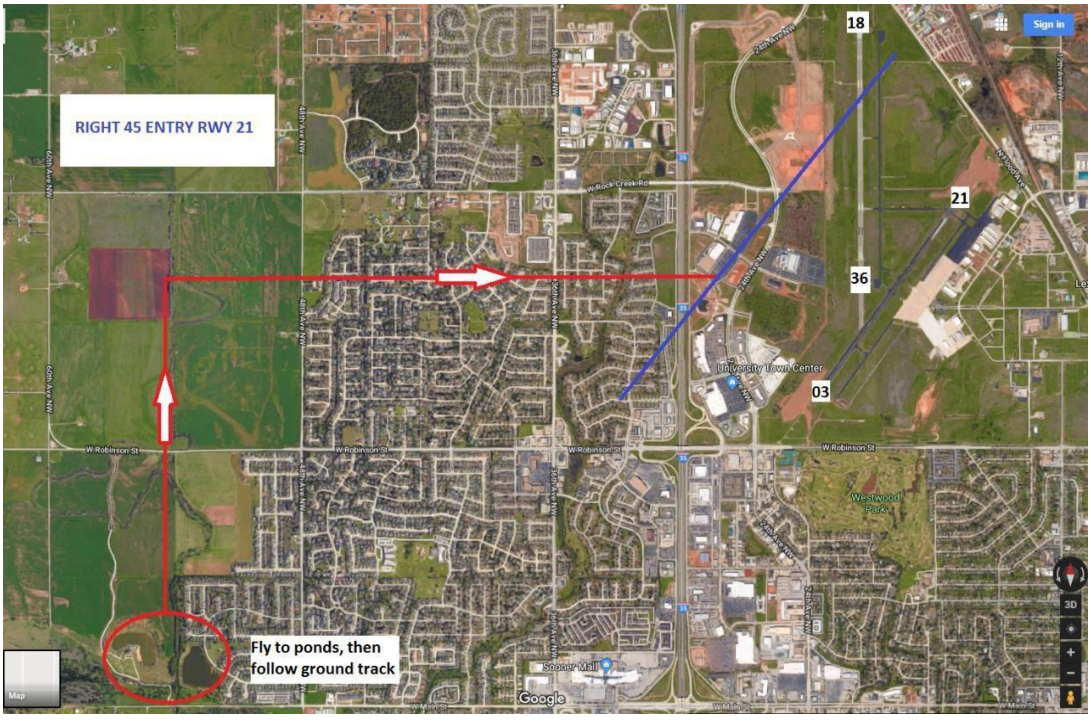
- - 1 = Amber
- - 2 = Good Life (170K) 18 DME off the IRW 203 radial
- - 3 = East Chickasha (watch for active parachute jumping area*)
- - 4 = Alexx
- - 5 = West Dibble – 19 DME off the IRW 220 Radial
- - 6 = North Dibble (assign last on north flow days)
- - 7 = South Dibble
- - 8 = Cole
- - 9 = Lindsay
- - 10 = Woody Chapel
- - 11 = Washington
- - 12 = Purcell* Always check NOTAM for possible sUAS activity up to 5,000 MSL
- - 13 = Pink
- - 14 = Oil Silo
- - 15 = Wanette
- - 16 = East Lake Thunderbird
- - 17 = South Hickory Hills
- - 18 = McCaslin
- - 19 = Wayne
- - 20 = Lexington * Always check Lexington NOTAM (possible sUAS activity)
- - 21 = Thunder Valley (assign last on north flow days)

45 Degree entry procedures

Runway 18



Runway 21



Dispatch and Solo Sign out procedures

When students arrive for their flight, they shall meet with their CFI and review weight and balance, syllabus ticket, and homework for the days flight. Once complete, they will be assigned an aircraft, assign a practice area if applicable, and issue the aircraft key.

Aircraft V-Speeds

PA-28-161 (KIAS)	
V_{SO}	**44**
1.1 V_{SO}	**48**
1.2 V_{SO}	**53**
1.3 V_{SO}	**57**
V_{S1}	**50**
V_X	**63**
V_Y	**79**
V_{FE}	**103**
V_A (@ max. gross)	**111**
V_{NO}	**126**
V_{NE}	**160**
Best Glide	**73**
Cruise Climb	**87**
"V_{REF}"	**63**
Max Crosswind	**17**

PA-28-181 (KIAS)	
V_{SO}	**45**
1.1 V_{SO}	**49**
1.2 V_{SO}	**54**
1.3 V_{SO}	**59**
V_{S1}	**50**
V_X	**64**
V_Y	**76**
V_{FE}	**102**
V_O (@ max. gross)	**113**
V_{NO}	**125**
V_{NE}	**154**
Best Glide	**76**
Cruise Climb	**87**
"V_{REF}"	**66**
Max Crosswind	**17**

Definitions:

Vso – Stall (Landing Configuration)
Vs1 – Stall (Specified Configuration)
Vx – Best Angle of Climb
Vy – Best Rate of Climb
Vfe – Maximum Flap Extension
Va – Maneuvering Speed
Vo – Maximum Operating Speed
Vno – Maximum Structural Cruise
Vne – Never Exceed Speed
Vref – Speed on Short Final

Other Calculations:

V_A/V_O:

$$\boldsymbol{V_A \text{ or } V_O = \&V_{A/O} \text{ at Max Gross-}\cdot \sqrt{\frac{\text{Landing Weight}}{\text{Max Gross}}}}$$

Weight Shift Formula:

$$\frac{\text{Weight Shifted}}{\text{Total Aircraft Weight}} = \frac{\Delta \text{ in CG}}{\text{Distance Moved}}$$

Pivotal Altitude:

$$\text{Pivotal Altitude} = \frac{\text{Groundspeed}^2}{11.3^*} + \text{Elevation}$$

**Groundspeed in knots. For miles-per-hour, divide by 15*

OU Flight Risk Assessment Tool (FRAT)

Each OU Flight (dual or solo) WILL have a FRAT tool filled out and analyzed by the PIC and their CFI. The FRAT will be provided to the dispatcher upon dispatch and the dispatcher will review "before" handing the pilot the aircraft key.

The current OU FRAT is available on the OU Student Resources website as a "combo FRAT/Wt and Balance form"

A paper combo form is also available by the Department Pilot Read File (PRF) and over at preflight planning areas of the Director's hangar lobby and the preflight room in the terminal lobby.

The OU FRAT allows each PIC and CFI to assess key aspects of RISK before flight and then to seek ways to reduce risk before the flight.

The FRAT should be started the "day before the flight" – much of the FRAT can be completed BEFORE showing up at the airport (and should be) and then "updated as necessary" upon show at airport with final review of preflight items.

OU pilots should be familiar with aspects of Risk Management/FRAT out of the FAA Risk Management Handbook pages 4-2 through 4-4.

OU Flight Risk Assessment Tool -- RISK FORM (FRAT) **Fly As A Champion!**

09-Jul-2024

Points to apply-->	1	2	3	4	5	RATING
Risk Area						
Crew	Dual w/CFI	Two Pilots	Solo			
Rest in last 24 hours	>8 hours	6.1 to 8 hours	5.1 to 6 hours	4.1 to 5 hours	<4 hours	
Sleep was restful	Yes		Partially		No	
Health	No issues		Recovering		Health Issues	
Last use of medicine	>48 hours		25 to 48		12 to 24	
8-12 hrs Alcohol	None		Some 9-12		Some 8-9	
	NO ALCOHOL 8 hours prior!					
Heat Index	<95	95 to 99	100 to 104		>105	
External stressors	Few		Several		Many	
Flight Type	VFR	MVFR	IFR		LIFR	
Day or Night	Day		Night Full Moon		No Moon	
Visibility	> 5 Miles	3-5 Miles	< 3 Miles		< 1 Mile	
Ceiling	>10,000	5K - 9K	3K - 4K	1K - 2K	<1K	
Winds	<10 kts	10-15 kts	>15 kts	>20 kts	>30 kts	
X wind actual	0-5 kts		6-10 kts		>16 kts	
X wind fcst	* If increasing with time beyond 15 kts must talk with CFI					
WX Stability	Stable		Slow deter		Possible Rapid	
Destination	Familiar			Unfamiliar		
	* If Unfamiliar - Solo - must discuss with CFI					
OU Variant acft	Crm 1-11, 13	TAA	Crm 37, 38, 39			
Aircraft Mx Status	Clean		Recent Write up			
Hours in type	>200	151-200	100-150	50-99	<50	
Flight hrs last 90 days	>20	15 to 20	10 to 14	5 to 9	<5	
Total Flight Time	>500	251-500	100-250	20-99	<20	
Read NOTAMS and PRF	Yes				No	
TOTAL RISK SCORE ---------->						

No unusual hazards. Use normal flight planning & establish personal mins & operating procedures	**22 - 45**
Some additional Risk - Talk to Your CFI and Dispatcher about Risk areas. Conduct flight planning with extra care. Review personal mins and operations procedures - mitigate risk areas if possible. (change airport/change planes/etc) YELLOW AREA	**46 - 51 Or 5 in any row**
Higher Risk. Must get approval of Sup. of Ops/fleet for flight. Conduct flight planning w/extra care. Review elements to ID those that could be modified to reduce risk. Develop contingency plans before takeoff for items. Decide before flight on alt. and consider special precautions to take. Consider delaying flight until risk conditions are reduced. RED AREA	**>51 Or two 5's**

Reference FAA.Gov Risk Management Handbook

PIC Signature: _____ **If Yel or Red: Assistant Chief Sign:** _____

CFI Name (Print): _____ **PRF#**_____

Fuel Procedures

OU Single Engine Aircraft

- During the Summer months when daytime highs routinely climb into the 90s – ramp fuel will be filled to "aircraft fuel tank TABS". Once high temps are not climbing into the 90s – ramp fuel loads will be "FULL"
- A PRF will be posted to inform when the change occurs.
- PICs should properly accomplish their weight and balance.
- During transition for a few days it is possible that you may find a different fuel load on an airplane – be flexible and be safe and conservative in airworthiness decisions.

Fuel Leaning Procedures

- OU checklists require fuel mixture to be set FULL RICH for takeoffs and landings.
  Except for exceptions found in the POH (high density altitude above 5,000 Density)
- Inflight leaning: when operating at cruise for extended periods may be accomplished after the procedure has been taught by your CFI.
- Lycoming prescribes inflight leaning by utilizing the "rich of peak" method.
  - This will be accomplished in accordance with the associated aircrafts POH under normal procedures.

This leaning is NOT NECESSARY for normal operations in the practice area for a nominal one-hour flight. Leaning should not be performed by students in cross country flights unless they have had thorough prior instruction on this procedure by their flight instructor.
Understanding the "why's and how's" is essential to proper leaning.

ALTERNATE CRUISE REFUELING PROCEDURES if Cruise Fueling Truck is BROKE
If OU aircraft require fuel - …..

1. Dispatch will coordinate with the CFI of the flight to have the aircraft towed to the fuel farm (tanks) (west side of the T hangar by field) and sight the orange chocks on the ramp by the fuel farm. Chocks will be lined up with

the RIGHT SIDE MAIN. **DO NOT** taxi aircraft with engine(s) running on the rough pavement
NOTE: Tow bar and/or power tower will be provided at the shut down area.

2. Tow straight towards the **3 orange cones in a line** the They will be several aircraft distance wise in front of the stopping position.
3. STOP when you are aligned with the LARGE ORANGE CONE **off your RIGHT WING**.
   - **Cruise will refuel the aircraft there.**
4. PILOT will stay by the aircraft.
5. Upon completion of refueling, tow aircraft to the far edge of the hanger.
6. Pilot starts engines and taxis off on mission.

EACH Aircraft CFI MUST call Cruise with the request when they need it.
Anticipate Cruise line staff meeting the aircraft within 10 min after the phone call. If they get other GA it could be longer, but hopefully not.
NOTE: If landing and YOU have time – please help out and fuel the aircraft on return – stop on the taxiway hammerhead (out of the way) and call Cruise and tell them you have landed and are taxiing to the fuel farm for top off.
NOTE: If fuel card is available, CFIs are authorized to refuel at other FBOs that accept the OU fuel card in lieu of the above refueling procedures.

Aircraft Operations – Pilot Preventive Maintenance

When checking engine oil in the Warriors and Pilot 100Is, normal engine quantity is 6 to 8 quarts according to Lycoming.

Handling Oil, Lubricants information for CFI's/Students/Maintenance personnel:

As a student, when you add engine oil or clean yokes YOU MUST HAVE YOUR CFI with you or another OU staff member.

If you handle oil, cleaning lubricants etc. use common sense and be careful not to spill on your skin or in/on aircraft. Plastic /latex disposable gloves are always available to you in the Director Hangar "supply cabinet" and at the Main Hangar (by King Air) supply table (where you find the oil and light bulbs). It is recommended you consider wearing gloves and wash your hands/skin that is exposed thoroughly following handling.
Always follow safety precautions on any packaging. Additionally, pilots will monitor aircraft refueling operations both on the OU ramp and at cross country refueling stops. Pilots will always sump their fuel after refueling. One should always use "basic common sense" if you handle such materials and spill fuel on your skin – and go wash your skin/hands. After handling lubricants/fuel - do not touch your eyes without washing your hands first.

Additionally, all materials Material Data Sheets (MDS info sheets) are filed in the Main Maintenance hangar and the MDS books are located on the King Air Supply Table for reference. Your CFI should take you on a tour of the maintenance shop each semester to look at **your aircraft maintenance forms** (the aircraft assigned to each CFI), familiarize you with the supply cabinet and table. And familiarize you with how to replenish engine oil and do yokes BUT, remember an OU CFI or staff member must be present when doing the preventive maintenance work. Students need to know how to do these preventive maintenance items as being accountable for the inherent responsibilities of a pilot in command and ability to perform preventive maintenance.

As stated in the above section on oil. If you spill oil in the engine or on the ground – **YOU MUST inform your CFI so he /she can inform Supervisor of Fleet and Maintenance so we know what happened. Even just a small bit.**

STICKEY YOKES

Although the yokes are cleaned and lubed every 100 hour and 50 hours, sometimes they can become dirty and slightly stick (when you check flight control movement). If the yoke is sticky, obtain a CFI and ask them to clean / lubricate the yoke.

Extra Aircraft Equipment Items:

If extra items are needed Dispatch will provide them Specifically,

- Yellow Maintenance Required Signs
- GATS fuel strainer jars
- Tie Down Straps
- Instrument Hoods
- Sun visors

Care of Aircraft:

There are several areas which with proper operation by the pilot will reduce wear and tear and thus reduce maintenance down time on the aircraft. CFI's will ensure each pilot is aware of these areas for all new flight students.

- How to open and close the top Warrior door latch
    - Use separate hand to put inward pressure on door before moving plastic latch.
    - From "inside" – ensure ample pulling in of door before moving latch.
- Engine Cowl gascolator
    - Do NOT use the GATS JAR "on the metal" – use gentle push in with your fingers to flow fuel into the GATS jar
        - Using the GATS jar puts undo torque stress on the gascolator unit causing the inside parts to start to leak excessively.
    - Place gascolator back in seat pouch to avoid melting in hot sun.
    - Always close the side window and place sunscreen in window
    - Fuel spills larger than the contents of a Gats jar need to be reported to airport ops

Bird Strikes and or Wildlife Strikes

During Aircraft Post Flight Walk Around pay attention for any “strikes” and /or damage

Any bird strike or other wildlife strike will be reported to the OU MOBILE and Dispatch immediately and the aircraft will be Squawked and downed for maintenance review.

A Safety report will be filled out and the FAA wildlife strike report also filled out.

FAA Bird Strike (https://wildlife.faa.gov/home)

Abnormal Events During Flight

sUAS sightings or interference

- If sighting occurs simply continue to fly your aircraft and avoid as necessary
- Report ASAP to nearest ATC facility – approx. height/location/description if able
- Upon landing call, the OU Mobile, complete an OU safety report & a FAA sUAS Sighting report

Degradation of NAV AID or GPS (not for internal aircraft nav issues)

- If degradation occurs during flight report to nearest ATC facility when traffic allows
- Upon landing – complete an OU safety report and complete an FAA NAVAID degradation form and / or a GPS degradation form
- If unsure – do a complete maintenance write up of the situation and department will troubleshoot.

Laser event toward Your Aircraft

- If you encounter a laser event – first and foremost DO NOT LOOK OUTSIDE OR AT IT – come inside and “fly the airplane – attempt to fly away from the location.
- Contact nearest ATC facility or tower and report your location and any other information you have
- If your eyesight is degraded at all – inform ATC, declare an emergency, and ask for nearest airport to land at.
- Upon landing call OU Mobile (in all cases). Complete an OU Safety Report and complete an FAA Laser event online report (https://www.faa.gov/aircraft/safety/report/laserinfo/media/FAA_Laser_Beam_Exposure_Questionnaire.pdf)

Section II: Briefings

Passenger Briefing

PASSENGER BRIEFING

SAFETY BRIEF

(To be performed on every flight)

(A) SEATBELTS
- a. Fastened and secured until the engine is shutdown.

(B) AIR FLOW
- a. For passenger comfort, on the instrument panel and floor
- b. Heater and Defrost

(C) FIRE ON START
- a. Continue to crank mags (up to 10sec)
- b. Open the throttle.
- c. Lean the Mixture
- d. Fuel pump off.
- e. Fuel selector off
- f. Fire extinguisher

(D) EXITS
- a. Top door latch then bottom door latch
- b. Kick out side-door windows.
- c. Crawl through baggage compartment

(E) Talking
- a. Positive exchange of controls (Three way)
- b. Sterile Cockpit during critical phases of flight (Taxi, Takeoff, and landing)

(F) Your Question
- a. Any questing before engine start.

Pre-Takeoff Briefing

PRE-TAKEOFF BRIEF SINGLE ENGINE AIRCRAFT
(To be performed on every flight)

Make a final review of your aircraft performance sheet including V_R, takeoff distance, and landing distance. Then brief your crew members on the following scenarios:

*First, brief who will be the PIC in an actual emergency and who will back up the PIC with the appropriate checklists.

Engine failure on takeoff roll:

- Explain that you will bring the power to idle and apply brakes as necessary.
  - Follow up by shutting off mixture, ignition, and anything else associated with fuel.
  - Request assistance from tower (this will likely be in the form of towing as you DO NOT want to attempt restarting the aircraft to move it).
  - Complete Engine Secure checklist.

Engine failure on takeoff with runway remaining:

- Explain that you will pitch for best glide (_) kts and land on the remaining runway. Use flaps as necessary.
  - Follow up by shutting off mixture, ignition, and anything else associated with fuel.
  - Request assistance from tower (this will likely be in the form of towing as you DO NOT want to attempt restarting the aircraft to move it).
  - Complete Engine Secure checklist.

Engine failure on takeoff without runway remaining and without adequate altitude to turn back for the runway:

- Explain that you will pitch for best glide (_ kts) and land straight ahead within the windscreen. Prepare for an emergency landing. Attempt emergency restart procedures as time permits - see checklist. Use flaps as necessary once landing is assured.
  - Follow up by shutting off mixture, ignition, and anything else associated with fuel.
  - Complete Engine Secure checklist.
  - Request assistance from ATC unless contact is lost, then try 121.5, and call OU Mobile at (405) 919-6319

Engine failure on takeoff without runway remaining but possibly enough altitude to turn back for the airport:

- This is not a recommended procedure and requires judgment. The usual problem is you don't have enough altitude to make the turn back to the field, so you would have a plan of action ahead of time and have an idea where open areas are so you can land straight ahead, or with minimal maneuvering left or right.
- Should you be high enough (we won't say what high enough is), you should pitch for best glide, turn towards any runway, set up for an emergency landing, and naturally communicate your intentions on the radio to ATC.

Again, it is strongly emphasized that MANY PILOTS GET THEMSELVES KILLED BY THINKING THEY CAN MAKE THE TURN BACK TO THE AIRPORT AND LAND THE AIRPLANE AFTER LOSING AN ENGINE.

Section III: Radio Procedures

Frequencies to Know

Emergency	121.5
Max Westheimer AWOS	119.55
Max Westheimer Ground	121.6
Max Westheimer Tower	118.0
Max Westheimer Unicom	122.95
Cruise Aviation Unicom (Fuel)	122.95
Dispatch & OU Traffic	123.3
Multicom at Uncontrolled Airports	122.9
Multicom Inflight	122.75
Flight Service (Mc Alester Radio)	122.4

OTHER FREQUENCIES IN THE OKC AREA

OKC Approach (South Flow)	120.45
OKC Approach (North Flow)	133.6
Will Rogers ATIS	125.85
Will Rogers Tower	119.35
Will Rogers Ground	121.9
Will Rogers Clearance	124.35
Deliver Will Rogers VOT	112.15
(VOR check)	128.72
Wiley Post ATIS	126.9
Wiley Post Tower	121.7
Wiley Post Ground	122.95
Wiley Post Unicom	

General Radio Procedures

A. Basic radio calls contain (in order):
   a. Who you are calling.
   b. Who you are.
   c. Where you are
   d. Your intentions

B. Listen to what is said to you and respond appropriately.

C. If in doubt about what was said in whole, or in part, ask the controller to "Say again," or "Say again, (misunderstood item)."

D. Always use correct phraseology (AIM glossary). Read Section 2 of the *AIM Basic Flight Information and ATC Procedures*.

E. Be **ADAPTABLE,** be ready to respond as the situation dictates, and always listen for the controller's call. Respond promptly, accurately, and as tersely as possible.

F. Student pilots must in their radio call identify themselves as a student pilot
   a. Ex. "Westheimer Tower, Crimson 5, Student Pilot, Midfield left downwind Runway 18, touch and go"

Radio Procedures at Max Westheimer Airport

Prior to taxi, monitor AWOS and note information.

TAXI CALL:
"Westheimer Ground"
"Crimson 5"
"At the South ramp (or North ramp)"
"With the numbers ready to taxi"
"Geographical direction of departure" (i.e. *North* departure, *Southwest* departure)

The controller will respond with a clearance to taxi to the active runway. Should the taxi path cross an active runway, you may be instructed to "hold short" of the runway.
Always read back your clearance including any "hold short" instructions.

TAKE-OFF CALL:
"Westheimer Tower"
"Crimson 5"
"Holding short of (enter appropriate runway number) Ready for take-off, runway *(insert appropriate number)"*
"(Direction) departure"

The controller will respond with a clearance to depart unless other traffic requires him/her to instruct you to "hold short."
After cleared for take-off, monitor the tower frequency until out of the Class D airspace or call tower to request a frequency change.

INBOUND CALL:
"Westheimer Tower"
"Crimson 5"
"Number of miles, geographic direction." (i.e. 8 miles, southwest) - this information describes your position relative to the airport of intended landing
"Inbound (type of landing)" (i.e. full stop, touch and go)

This call should be made within 10 miles of the airport, but prior to reaching 5 miles. The controller will respond with directions to enter the traffic pattern for a specific runway, and advise of the current winds and altimeter.
He/she will also instruct you to report your position at a certain point during your approach to the airport.
Again, always read back your clearances, including reporting positions.

LANDING CALL:
"Westheimer Tower"
"Crimson 5"
"Your position." (in the traffic pattern - i.e. on the 45, left/right downwind, base - always report your actual position even if it differs from where you were told to report)
"Runway #" (the runway for which you were advised to report)
"Type of landing" (i.e. full stop, touch and go)

The controller will clear you for the type of landing requested, unless unable or misunderstood. Ensure you do not touch down without a clearance to do so!

AFTER - LANDING CALL:
"Westheimer Tower"
"Crimson 5"
"Clear of runway (runway #) at (taxiway location)"
"Taxi to University parking" (Listen carefully for any hold-short instructions)

All approaches to an airport will be made so as to enter the downwind leg of the traffic pattern at a 45° angle to the midpoint of the downwind leg. Straight-in approaches will not be requested. Instructions from the air traffic controller on entering the airport traffic pattern will be obeyed. Question the controller if you believe he/she has misunderstood your radio call.

Ensure that you are aware of what the different clearance phraseology means:

- Cleared to land - you will land, roll straight ahead, and exit the runway on the first suitable taxiway.
- Cleared for touch and go - you will land, continue your roll, apply power and take off again.
- Cleared for stop and go - you will land, come to a full stop, apply power and take off again.
- Cleared for the option - you may do any of the above at your discretion.
- Cleared Low Approach- you may approach to land but my not touchdown to land.

Remember that a clearance to "taxi to" a runway gives the pilot the permission to taxi to the assigned runway, crossing any runways and taxiways enroute. The exception to these instructions is the addition of the term "hold-short." Then you are only cleared to a certain position at which you must hold short until advised to cross. In all situations the pilot in command must maintain vigilance for other traffic and make all decisions with safety in mind.

It is highly recommended that you read Ch. 4, Sections 1, 2, and 3 in the *Airman's Information* As well as the Pilot/controller Glossar

Radio Procedures at Uncontrolled Airports

Prior to taxi, monitor AWOS or windsock and note information. TAXI CALL:
"(Airport name) Traffic."
"Crimson 5."
"Taxiing to runway (insert appropriate number)."
"(Airport name)."

Example: "Purcell Traffic, Crimson 5, taxiing to runway one seven, Purcell."

TAKE-OFF CALL:
"(Airport name) Traffic."
"Crimson 5."
"Departing runway (insert appropriate number)."
"(Direction) departure."

Listen to CTAF and visually scan the approach area for other traffic.
Make position reports on CTAF while in the traffic pattern and departing.

INBOUND CALL:
"(Airport name) Traffic."
"Crimson 5."
"Number of miles, geographic direction" (i.e. 8 miles, southwest) - this information describes your position relative to the airport of intended landing.
"Inbound for (type of landing)"

The inbound radio call should first be made when within 10 statute miles of the airport. If the airport is served by a "Unicom" facility, the pilot should address the inbound call to "Unicom" instead of "Traffic" and add the statement "request airport advisory" to the final line of the inbound radio call, after the word "Inbound."

TRAFFIC PATTERN AND LANDING CALLS:
"(Airport name) Traffic."
"Crimson 5."
"(Turn direction) (leg of traffic pattern) (runway number)."

Example: "Purcell Traffic, Crimson 5, on the forty-five to a left-downwind, runway, one-seven, Purcell." (followed by a report on each leg of the pattern)

- When established on final approach, change the third line of the landing radio call to read: "(Distance from the runway) final, runway (number), (type of landing)."

Example: "Purcell Traffic, Crimson 5, one mile final, runway one seven, touch and go, Purcell."

AFTER - LANDING CALL:
"(Airport name) Traffic."
"Crimson 5."
"Clear of runway (insert appropriate number)"
"(Airport name)."

Radio Procedures at Major Airports

I. ATIS

a. Before calling Tower or Approach Control,

b. Listen for the following:

1. Ceiling & visibility: Do you need a SVFR or IFR clearance?

ii. Winds: Visualize crosswind and landing runway

iii. Altimeter setting: Check and set

iv. Instrument approach: Review which runway and approach to expect

v. Frequencies: Set appropriate frequencies for comm and nav Vi. Notams: Listen and determine how they will affect you

Vii. Alphabetical code: Listen for broadcast name (information Bravo)

II. OKE CITY APPROACH

a. Initial call:

i. "Oke city approach."

ii. "Crimson 5."

iii. "(Distance) miles (direction from airport) at (altitude)."

iv. "With (state ATIS broadcast name)."

Example: "Oke City approach, Crimson 5, 15 miles northwest, four thousand, with *Bravo*."

v. The controller will acknowledge your call and assign you a transponder (squawk) code. Respond by repeating the code and your call sign.

b. Follow-up call:

i. The controller will call and acknowledge that radar contact has been established. Give the controller your intentions, direction of flight, and altitude to which you are climbing or descending.

c. On subsequent calls:

i. Answer or acknowledge any request from ATC, and end transmission with your call sign as ATC uses it (it may be abbreviated).

ii. Example: "Right turn, three five zero, Crimson 1."

III. FINAL CONTROLLER

a. ATC will initiate hand off to the final controller

i. Example: "Crimson 5, contact Oke City approach on 124.6."

ii. The proper response is "one two four six, Crimson 5."

b. Switch to the assigned frequency.

c. "Oke City approach."

d. "Crimson 5."

e. "3,500 (state altitude and change, if any)."

IV. WILL ROGERS TOWER

a. ATC will initiate the hand off:

i. "Crimson 5, contact Rogers Tower on 119.35."

ii. The proper response is "one, one, niner, three, five, Crimson 5"

b. To call tower, use a standard inbound radio call:

i. "Roger's tower."

ii. "Crimson 5."

iii. "Inbound."

iv. "(State type) landing."

c. When the tower responds, or makes requests, the pilot should respond and acknowledge with the aircraft call sign.

V. GROUND CONTROL

a. Do not contact ground control until advised by tower and you are clear of the active runway (past the hold line).
b. Make a taxi call to the ground controller:
   i. "Rogers ground."
   ii. "Crimson 5."
   iii. "Clear of runway (insert appropriate number)." (i.e. three five right)
   iv. "Taxi to (state desired location on airport, such as name of FBO)."
c. Follow the controller's instructions in his response. Acknowledge your understanding by repeating and hold short instructions and your call sign.

VI. CLEARANCE DELIVERY

a. Listen to ATIS first, and be ready to write down information and clearance. If VFR, know your departure direction (heading) and altitude.
   i. "Rogers Clearance Delivery."
   ii. "Crimson 5."
   iii. "VFR/IFR to (state destination), with (ATIS broadcast name)."
b. Clearance Delivery will provide your IFR clearance or departure instructions for a VFR departure, including a transponder code and departure frequency.
c. Read back your clearance and get affirmation from controller that your read-back was correct. Then switch to ground control for taxi instructions.

VII. DEPARTURE CONTROL

a. After take-off, the tower will advise when to contact departure control and the appropriate frequency. Do not change frequencies without being instructed to do so. However, if you believe your hand off may have been forgotten, query the tower controller.
b. Initial call:
   i. "Oke City approach."
   ii. "Crimson 5."
   iii. "3,500, (state current altitude and what you're climbing to per your clearance)."
   1. Example: "Oke City approach, Crimson 5, with you at two thousand two hundred, climbing three thousand."

OU FLIGHT OPERATIONS ARE NOT ALLOWED AFTER DISPATCH IS SECURED.

The Following are OU Department of Aviation Operating Hours for local airports:

OU Airport:

Solo:

5 AM to 11 PM	no restrictions
11 PM - Midnight	one touch and go/stop and go or full stop.
Midnight	no operations - all solos must be landed by midnight.

Dual:

5 AM to 11:00 p.m.	no restrictions.
11 PM to Midnight	one touch and go/stop and go or full stop termination.
Midnight – 2am	no operations - all solos must be landed by midnight.

Any flight staying out past midnight must get approval by their Assistant

Chief.

No KOUN local flights will take off after 10:30PM to return by midnight.

All dual aircraft should be back by midnight.

All Solo cross countries should return no later than 11:30PM

Student Pilots on solo flights must be on the ground by sunset.

Section IV: Cockpit Management

Cockpit Management

DESCRIPTION: A systematic method for organizing materials and equipment so they are ready, available and adequate for ensuring crew coordination and briefing of passengers.

OBJECTIVE: To develop the ability to efficiently organize and manage the cockpit environment both prior to and during flight.

PROCEDURES:

1) Arriving at the airplane, verify that all equipment and materials needed for the flight are accounted for. This may include: operating manual, pen and paper, charts, cross-country materials, hood, survival kit, navigation equipment (radios), checklists, airplane certificates, flashlight, flight case, baggage, etc.
2) Verify that all required inspections (100 hr., annual, IFR, MEL, VORs) as appropriate for the flight are current.
3) Organize and carefully secure all items, making sure they are readily available.
4) Brief all occupants on seat adjustment. Seat belt use, airplane exits, emergency equipment, air vents and if appropriate oxygen.
5) Ensure that all occupants are properly seated and doors closed properly.
6) Carefully adjust your seat and seat belts so as to allow easy access to all controls and equipment.
7) If appropriate determine who will be PIC and what, if any, duties you expect the co-pilot to perform.
8) During the flight, remain well-organized and alert to the needs of the passengers.

Section V: Takeoffs

Normal and Crosswind Takeoff and Climb

Description:	The airplane will be aligned with the runway centerline and the ailerons held into the wind. Takeoff power will be applied and the airplane is allowed to accelerate to rotation speed at which time the pitch attitude is increased to establish a positive lift-off and a Vy airspeed. Once airborne a crab angle will be established to maintain a ground track that is aligned with the runway centerline.
Objective:	To develop the student's ability to safely accomplish a takeoff and departure under normal and crosswind conditions.
Procedures:	1) Set the flaps to the manufacturer's recommended takeoff position, check for traffic (clear final and runway for obstructions) and taxi into position on the runway. 2) Align the airplane with the runway centerline and apply full aileron into the wind with the elevator in the neutral position. 3) Smoothly apply full power and check the engine instruments. 4) As the airplane accelerates, adjust the ailerons as necessary to control drift and maintain runway alignment with the rudder. 5) At manufacturer's recommended airspeed apply back elevator pressure to liftoff and then adjust the pitch altitude to establish the proper initial climb speed. 6) If a significant crosswind exists, the airplane should be kept on the ground slightly longer than normal and a firm and definite liftoff accomplished. 7) As the airplane leaves the runway, Aileron deflection into the wind might result in the downwind wing and main gear lifting off first. 8) After liftoff in crosswind conditions initiate a crab angle into the wind. 9) At a safe flap retraction speed and altitude, retract flaps (if extended) and establish by airspeed. 10) During climb out, maintain a ground track aligned with the runway centerline.
References:	FAA Private and Commercial Airmen Certification Standards Airplane Flying Handbook FAA-H-8083-3C

Soft-Field Takeoff and Climb

Description:	A nose high pitch attitude is maintained during the takeoff roll in order to quickly transfer the airplane's weight to the wings and then lift off as soon as possible. After liftoff, the airplane is flown in ground effect until a safe climb out speed is attained. Vx
Objective:	To develop the student's ability to obtain maximum performance from the airplane when taking off from a soft or rough field.
Procedure:	1) Extend the flaps to the recommended takeoff setting. 2) Hold the elevator control full up and use aileron to correct for crosswind. 3) Check for traffic and keep the airplane moving at a brisk pace while taxiing onto the runway -- don't use brakes unless it is necessary. 4) Smoothly apply full power and check the engine instruments. Hold full up elevator until the nose begins to rise. As the pitch attitude approaches approximately Vx, adjust elevator control pressure to maintain this altitude. 5) Once airborne, adjust the pitch altitude as necessary in order to remain in ground effect while the airplane accelerates to a safe climb speed. 6) As the airplane speed approaches Vx, establish a Vx or Vy airspeed and achieve a positive rate of climb. 7) Upon achieving a positive rate of climb and clear of obstacles establish and maintain Vy pitch attitude. 8) After reaching a safe airspeed and altitude retract the flaps. 9) Establish cruise climb above a minimum safe altitude.
Reference:	FAA Private and Commercial Airmen Certification Standards, Airplane Flying Handbook FAA-H-8083-3C

Short-Field Takeoff and Climb

Description:	The airplane is accelerated to liftoff speed in the shortest distance possible and established in a maximum angle climb until all obstacles are cleared.
Objective:	To develop the students ability to obtain maximum performance from the airplane while executing a short field takeoff and safely clearing all obstacles in the departure path.
Procedure:	1) Extend the flaps to the recommended take off setting. 2) Check for traffic and taxi into position at the end of the runway so that maximum runway length is available for takeoff. Use appropriate control deflections to correct for crosswind conditions. 3) Hold the brakes and apply full power. 4) Check the engine instruments. 5) Release the brakes after obtaining full power indications. 6) Adjust the elevator control approximately neutral to maintain a level pitch attitude until just prior to rotation Per the POH performance chart. 7) Accelerate to rotation speed and rotate to a pitch attitude that produces a Vx climb speed. 8) Maintain Vx until clear of obstacles. 9) After clearing obstacles, retract the flaps (one at a time) then pitch for Vy. 10) Maintain Vy until a safe altitude is reached (normally 500’ AGL) then accelerate to cruise climb and set climb power.
Reference:	FAA Private and Commercial Airmen Certification Standards, Airplane Flying Handbook FAA-H-8083-3C

SECTION VI: Landings

Forward Slips to Landing

Description:	During a forward slip, one wing on the airplane is lowered and the airplane is yawed in the opposite direction so that the airplane's longitudinal axis is at an angle to the airplane's flight path.
Objective:	To teach the student a method of steepening the final approach path without increasing airspeed.
Procedures:	**Note: CONSULT THE PILOT'S INFORMATION HANDBOOK FOR INFORMATION REGARDING USE OF FLAPS OR ANY OTHER LIMITATIONS WHILE PERFORMING SLIPS.**

1) One wing is lowered (normally the upwind wing when a crosswind exists) using aileron.
2) Adjust airspeed to compensate for airspeed indicator error caused by static air disturbances. (Approx. 75 kts)
3) Use enough rudder to maintain the original ground track.
4) The airplane is now flying at an angle to the relative wind and is in a high drag situation. Therefore, an appropriate pitch attitude must be maintained so that an approach to a stall is avoided and sufficient control is available to make the round out and flare safely.
5) Prior to the flare, the forward slip must be discontinued, and the longitudinal axis must be aligned with the runway.
6) After discontinuing the forward slip, execute the appropriate landing procedure.

References: Airplane Flying Handbook FAA-H-8083-3C

FAA Private and Commercial Pilot Airmen Certification Standards (ACS)

Advanced Pilot's Flight Manual- Kershner

Normal and Crosswind Approach and Landing

Description:

After entering the traffic pattern, the airplane is aligned with the runway centerline on final approach. The landing flap setting is made, and a crab angle is established if necessary. A stabilized (airspeed, approach descent angle, and airplane configuration) final approach is established. At an appropriate altitude, a transition to landing pitch attitude is begun in a manner that will allow the airplane to touch down in the proper power off stall pitch attitude. After touchdown, the airplane is slowed to a normal taxi speed on the runway centerline and then taxied clear of the runway. Appropriate crosswind control is maintained throughout the final approach, landing, and rollout.

Objective:

To develop the student's ability to safely and accurately execute an approach, landing, and rollout in normal and crosswind conditions.

Procedures:

1) Complete the appropriate traffic pattern.
2) Achieve a stabilized, power on approach and the final flap setting prior to descending below 300' AGL. Use normal approach speed plus ½ the wind gust factor, if appropriate.
3) Make coordinated changes in pitch attitude and power so that a touchdown can be made at the appropriate point on the runway.

NOTE: Crosswind conditions may require a reduced flap setting for approach and landing. Care must be exercised to ensure adequate runway length.

4) Prior to beginning the round out and flare, correct for drift by using the wing-low method and establishing a sideslip. Use aileron to correct for drift and use rudder to keep the airplane's longitudinal axis aligned with the runway.
5) At the appropriate flare altitude, increase the pitch attitude and reduce power at a rate that will allow a slow decrease in rate of descent and airspeed so that touchdown occurs just as the power reaches idle and the pitch attitude reaches the power off stall attitude. Use of proper crosswind technique will result in touchdown on the upwind main gear first, followed by the downwind main gear, and then the nose gear.
6) Gusty wind conditions may require a touchdown at a slightly higher speed than normal (5-10 KIAS above power off stall speed) and a slightly lower than normal pitch attitude.

References:

Airplane Flying Handbook FAA-H-8083-3C

FAA Private and Commercial Pilot Airmen Certification Standards (ACS)

Soft-Field Approach and Landing

Description:	An approach to, and landing on, a soft or rough runway. Power is used during the round out and flare to provide a high degree of control so that the touchdown is as gentle and slow as possible. The nose gear can be lowered gently to the runway surface after the main gear is on the runway.
Objective:	To develop the student's ability to obtain maximum performance from the airplane so that a soft touchdown at the slowest possible airspeed can be made.
Procedures:	1) Establish a stabilized power on approach and the final flap setting prior to descending below 300' above runway elevation at normal or short field approach speed, as appropriate, with flaps extended to the landing position. Add the wind gust factor to the approach speed as appropriate. 2) Select the touchdown area on the runway. 3) Make adjustments in the power setting to remain on the proper glide path. 4) Make adjustments to the airplane pitch attitude to maintain the proper airspeed. 5) At the appropriate flare altitude, increase the pitch attitude to touchdown as descent is continued to a height of 1 to 2 feet above the runway. Use power throughout the flare so that a smooth and gentle touchdown on the main gear can be achieved at the slowest possible airspeed. 6) After touchdown, keep the weight off the nose gear as long as possible, and then gently lower the nose gear to the runway while maintaining back elevator pressure. 7) Use power as necessary to taxi. 8) Use brakes only as necessary. 9) Slow to normal taxi speed before clearing the runway. 10) Complete the after landing checklist when clear of the runway.
References:	Airplane Flying Handbook FAA-H-8083-3C FAA Private and Commercial Pilot Airmen Certification Standards (ACS)

Short-Field Approach and Landing

Description:

An approach and landing is accomplished at an airport with a restricted runway length due to obstacles on the approach path, short runway, unfavorable runway gradient, required downwind landing, high density altitude, or a combination of these factors. The approach is stabilized no lower than 300' above runway elevation. The round out and flare is accomplished in a manner that allows the airplane to reach the power off stall pitch attitude as the main landing gear touches the runway with power reaching idle at the same time. The roll out is minimized by proper use of aerodynamic deceleration and airplane wheel brakes.

Objective:

To develop the student's ability to safely and accurately accomplish maximum performance approaches and landings.

Procedures:

1) Select and plan the appropriate flight path and touchdown point on the runway.
2) Establish a stabilized power on approach prior to descending below 300' above runway elevation at the manufacturer's recommended short field approach speed with flaps extended to the landing position. Add ½ the wind gust factor to the approach speed as appropriate.
3) Make adjustment in the power setting to remain on the proper glide path and to avoid obstacles.
4) Make adjustments to the airplane pitch attitude to maintain the proper airspeed.
5) At the appropriate flare altitude, increase the pitch attitude and reduce power to a setting that will allow a slow decrease in rate of descent and airspeed so that touchdown occurs just as the power reaches idle and the pitch attitude reaches the power off stall attitude.

(NOTE: Touchdown point for a runway that has threshold markings should be the numbers. Touchdown point for a runway that does not have threshold markings should be the first centerline stripe beyond the numbers)

6) After touchdown, retract the flaps and apply full aft stabilator to achieve maximum aerodynamic braking without skidding the tires.
7) Slow to normal taxi speed before clearing the runway.
8) Complete the after landing checklist after the airplane clears the runway and comes to a complete stop.

References:

Airplane Flying Handbook FAA-H-8083-3C

FAA Private and Commercial Pilot Airmen Certification Standards (ACS)

Power-Off 180 Degree Accuracy Approach and Landing

Description:	In the landing configuration, with the power at idle, the airplane is maneuvered from downwind, abeam the touchdown point to a landing no more than 200 feet beyond a point specified by the examiner
Objective:	To develop the student's ability to maneuver with the power at idle, from downwind, abeam the touchdown point to a landing no more than 200 feet beyond a point on the runway specified by the examiner
Procedures:	1) Enter the traffic pattern at a 45 degree to the downwind 2) Make all appropriate radio calls 3) Clear the base and final for any traffic 4) Establish an altitude of 1000' AGL or TPA, whichever is higher 5) Abeam touchdown point – Power idle (1,000ft bars) 6) Slow to best glide speed (73KIAS for warrior, 76KIAS for 100i) 7) Adjust glide path with flaps and /or by slipping and/or adjusting airspeed 8) Short final slow to touchdown airspeed of approx. 1.2Vso 9) Touch down no more than 200' beyond predetermined point. 10) After touchdown, take a deep breath, retract flaps and then begin applying brakes as necessary
References:	Airplane Flying Handbook FAA-H-8083-3C FAA Commercial Pilot Airmen Certification Standards FAA-S-ACS-7 (Changes 1&2)

Go Around from a Rejected (Balked) Landing

Description:	The landing approach is abandoned and the airplane is transitioned to a climb
Objective:	To develop the student's ability to safely perform a go-around/rejected landing procedure
Procedures:	1) Smoothly, apply full power (mixture as required) 2) Adjust the pitch attitude to stop the descent 3) Retract the flaps gradually to the takeoff position, adjust the pitch attitude to climb at Vy or Vx as appropriate 4) Trim the aircraft 5) After clearing obstacles establish a Vy climb 6) Use appropriate collision avoidance techniques throughout the entire procedure 7) Radio intentions as appropriate
References:	Airplane Flying Handbook FAA-H-8083-3C FAA Commercial Pilot Airmen Certification Standards FAA-S-ACS-7 (Changes 1&2)

SECTION VII: Traffic Patterns

Traffic Pattern Operations

Description: The traffic pattern is used to establish an orderly flow of traffic for airplanes arriving, departing and operating in the vicinity of airports. The pattern consists of arrival to and departure from an airport while executing proper cockpit duties.

Objective: To develop the ability to conduct safe and efficient airport arrival and departure procedures.

Procedures:

1) Determine the active runway by an appropriate method. (wind direction or NOTAMs)
2) Establish the airplane on a 45° ground track toward the midpoint of the downwind leg unless otherwise directed by the control tower. Pattern altitude must be established 2 miles prior to reaching the downwind entry point. Slow to traffic pattern airspeed before turning downwind.
3) Maintain strict vigilance for other airplanes established in the pattern or in the vicinity of the airport.
4) Complete the pre-landing checklist.
5) Turn the airplane onto the downwind leg approximately ½ miles to 1 mile out from the active runway. Estimate wind direction and velocity by observing the windsock and make appropriate pattern adjustments. Maintain pattern altitude and airspeed unless traffic separation or ATC instructions dictate otherwise.
6) When abeam the point of intended landing check speed below Vfe, extend the flaps to an appropriate position and begin descent at an appropriate point considering traffic, terrain, obstacles, traffic pattern size, and ATC instructions. (90kts)
7) Clear for traffic and turn base leg when 45° from touchdown point.(80kts)
8) Coordinate the pitch and power to maintain the desired approach angle and base leg airspeed.
9) Visually clear the final approach path and turn on to final approach with the airplane aligned with the runway.
10) Extend flaps to the landing position (normally full down). Make coordinated pitch attitude and power adjustments to maintain the desired approach angle and final approach airspeed.
11) Adjust the final approach airspeed by adding ½ the gust factor if appropriate.
12) Achieve a stabilized final approach no lower than 300’ AGL
13) Execute the appropriate landing procedure.
14) After liftoff, maintain runway alignment and appropriate climb airspeed (Vx if obstacle or Vy)
15) After reaching a safe airspeed and altitude, retract the flaps if

16) Upon reaching a safe altitude, clear of obstacles but not less than 500’ AGL, accelerate to cruise climb airspeed
17) Continue straight out or exit with a 45° turn in the direction of the traffic pattern when beyond the departure end of the runway and at or above traffic pattern altitude.
18) Continue climb to appropriate altitude and proceed on course when clear of the airport and traffic
19) Closed pattern operation: clear for traffic and begin the turn to the crosswind leg beyond the departure end of the runway and within 500 feet of pattern altitude.
20) Upon reaching traffic pattern altitude, accelerate to traffic pattern airspeed and set power
21) Initiate the pre-landing checklist after completing the turn to the downwind leg.

Note: the above procedures assume an ideal traffic pattern situation. Additional traffic, ATC, local pattern restrictions, noise abatement procedures, obstacles, etc., may dictate modification of these procedures. In all cases the pilot shall exercise good judgment and maintain positive airplane control at all times.

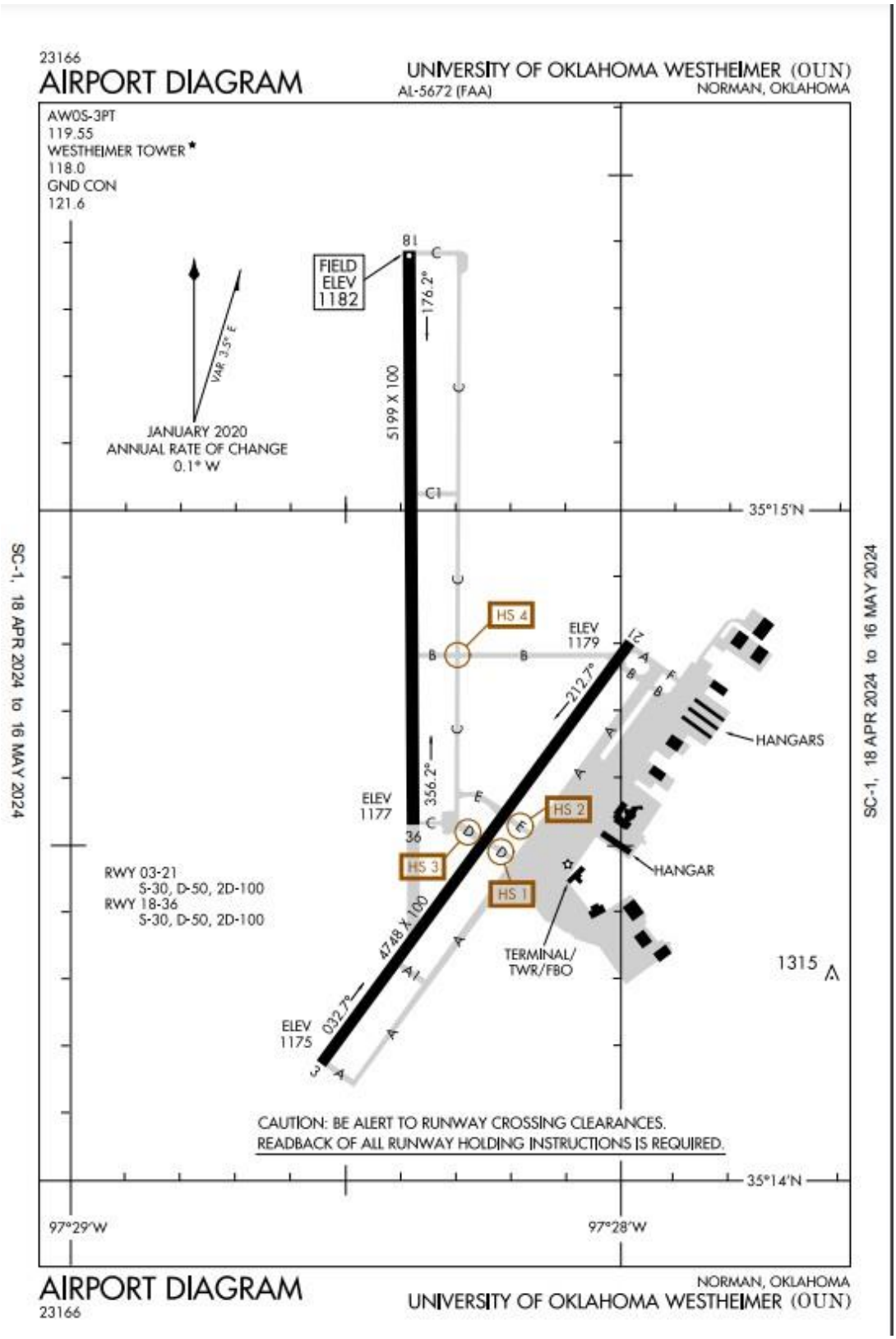
References:

Airplane Flying Handbook FAA-H-8083-3C

FAA Commercial Pilot Airmen Certification Standards FAA-S-ACS-7A (With Change 1)

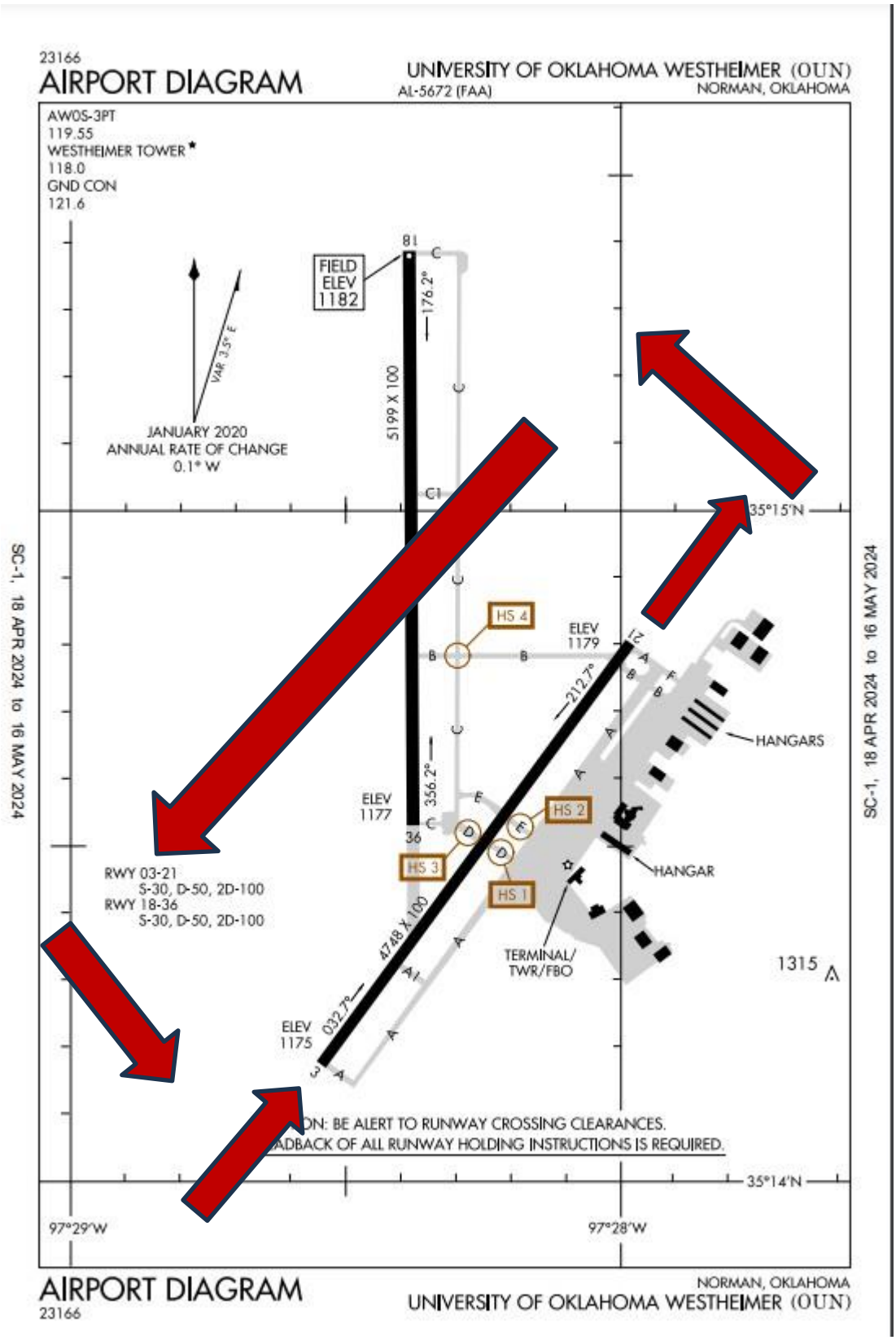
AIM (current Revision)

Max Westheimer Airport Diagram



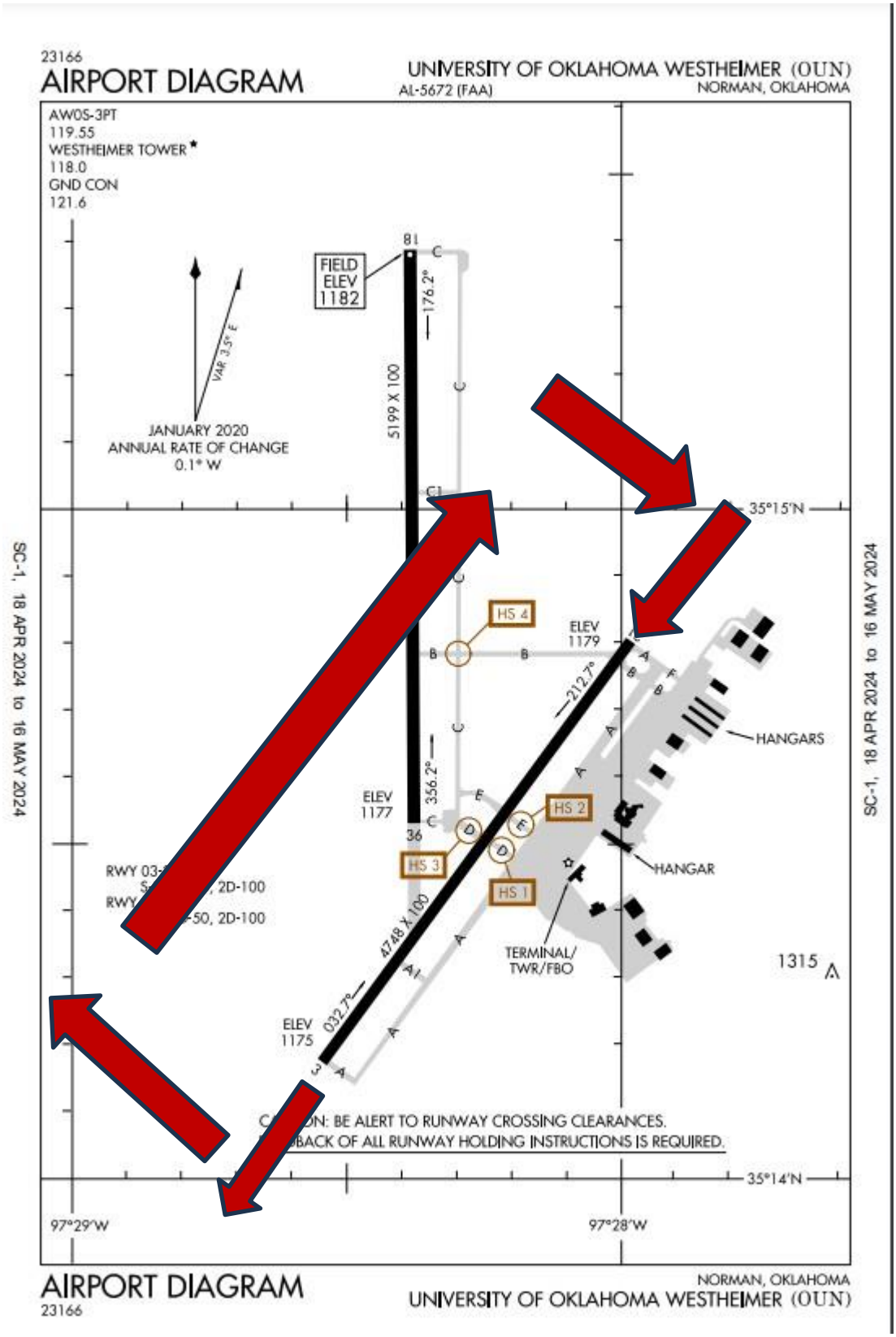
Max Westheimer Runway 03 Traffic Pattern

NOT TO SCALE



Max Westheimer Runway 21 Traffic Pattern

NOT TO SCALE



Max Westheimer Runway 36 Traffic Pattern

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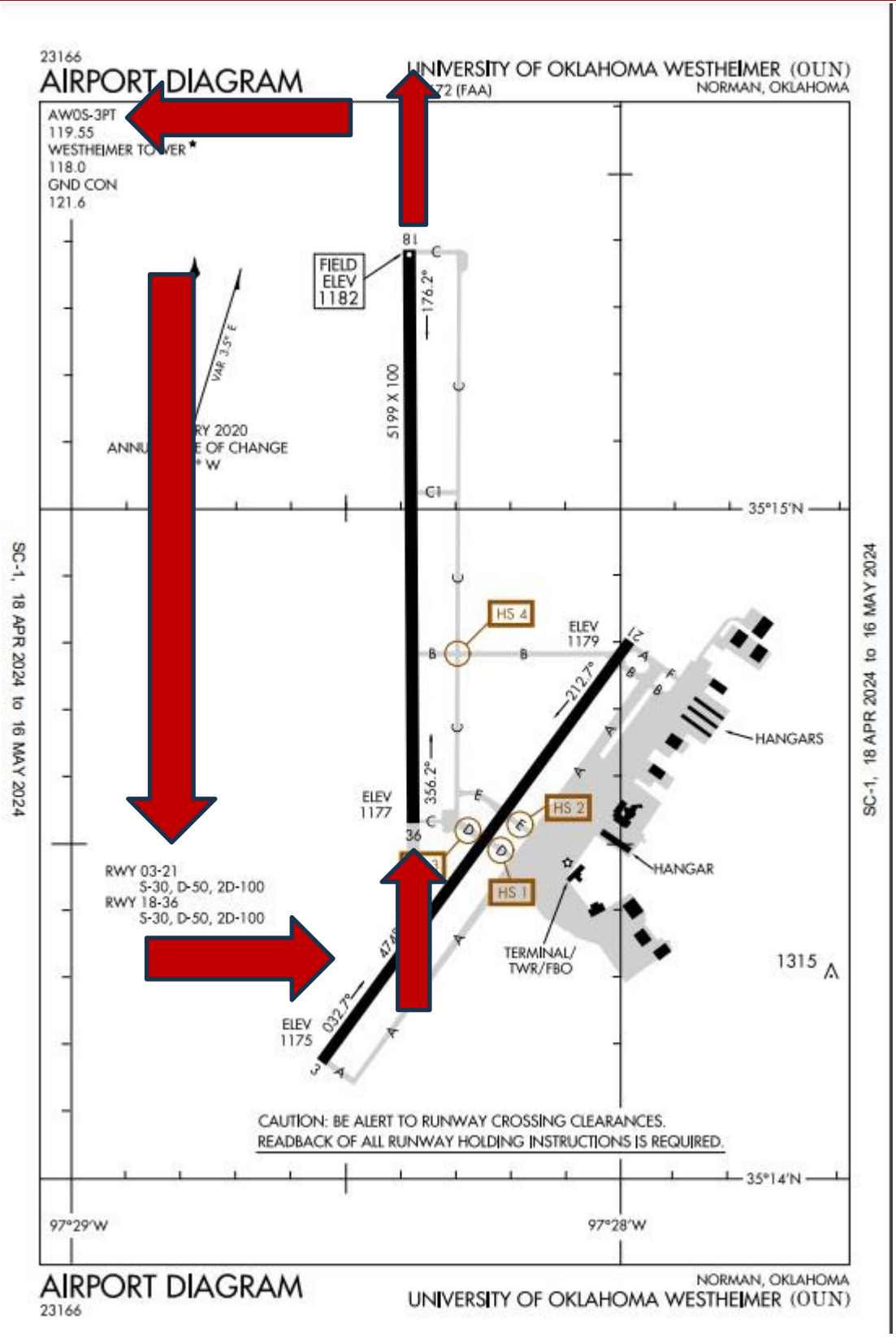
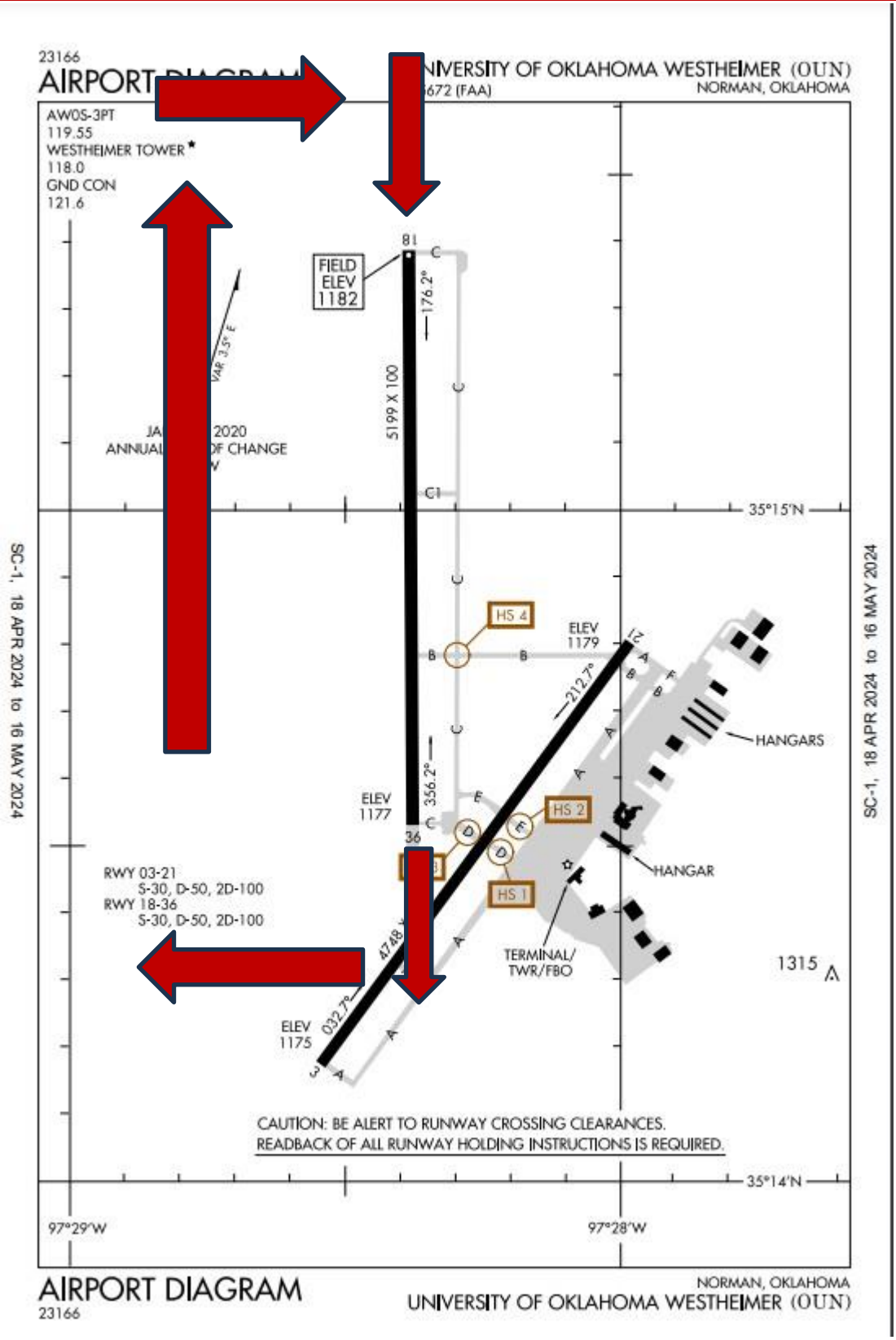


Max Westheimer Runway 18 Traffic Pattern

NOT TO SCALE



SECTION VIII: Emergencies

Emergency Approach and Landing

Description: The airplane is maneuvered, power-off, to the best available landing site. Time and altitude permitting, cockpit procedures are completed.

Objective: To develop the skill and proficiency necessary to accomplish a power-off emergency approach and landing to the best available site.

Procedures:

1) Establish and trim for best glide speed.
2) Select best available landing site within glide range

--Look first for a site downwind—this will extend your glide range.

-- Pick a site as close as possible. (preferably plowed in the direction of landing)

3) Maneuver the airplane to the "key position" left or right downwind, abeam the touchdown point.
4) Complete the engine failure check list **TIME AND ALTITUDE PERMITTING.** (unless there is an actual emergency, this step is simulated)
5) Squawk 7700 and declare an emergency on frequency 121.5 (or to ATC if in contact with ATC)

Note: Unless there is an actual emergency, this step is simulated.

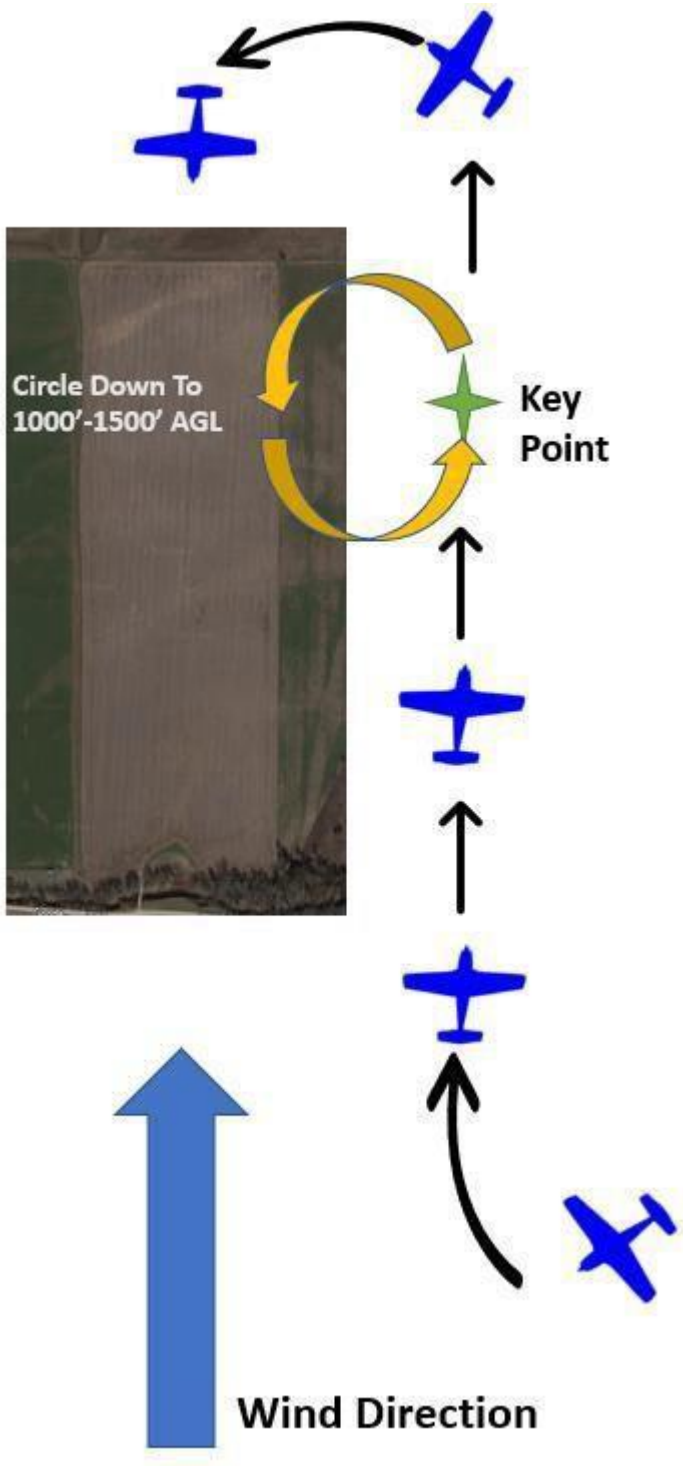
6) Upon arrival at the "key position" execute 360° turns at 30° of bank until reaching an altitude of 1000-1500' AGL
7) Ignition off, fuel selector off, mixture lean **Note: unless there is an actual emergency, this step is simulated.**
8) Master switch off when radio communication is no longer required. **Note: unless there is an actual emergency, this step is simulated.**
9) Unlatch door.

Note: unless there is an actual emergency, this step is simulated.

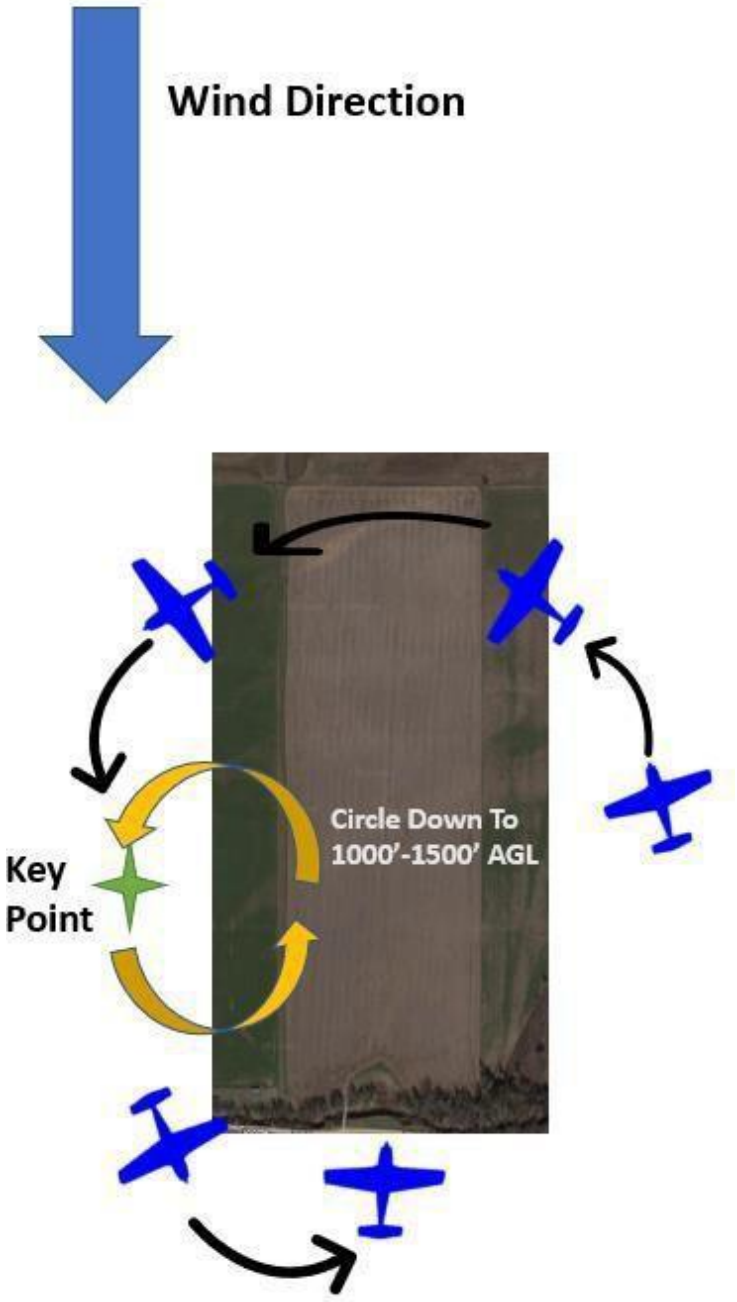
10) From the "key position" fly an abbreviated downwind base and final to the field.
11) When landing is assured, extend flaps and gear if appropriate and touch down at the slowest possible airspeed using a nose high attitude in the flare.
12) *Initiate recovery to avoid descent below 500' AGL unless over an approved landing point (i.e. runway)

References: Airplane Flying Handbook FAA-A-8083-3C

Emergency Approach (Downwind Approach to Field)



Emergency Approach (Upwind Approach to Field)



Unusual Flight Attitudes

Description: The instructor or student will place the airplane in an unexpected attitude. When told to recover, the student will assume control, stabilize the airplane, and return it to its original flight path by reference to available flight instruments.

Objective: To learn to recognize and properly recover from unusual attitudes by reference to both full and partial instrument panels.

Procedures:

1) The student is instructed to take her/his hands and feet off the controls and close her/his eyes.
2) The instructor clears the area for other airplane traffic and ensures that the altitude is adequate for the safe conduct of the maneuvers.
3) The instructor then puts the airplane into a critical flight attitude.
4) Then, the instructor will clearly say, “open your eyes and recover.”
5) The student will look at the flight instruments to determine what kind of critical attitude the airplane is in, and how best to recover.
6) Recovery is initiated and the airplane is stabilized.
7) Return to original flight path and altitude as rapidly as practicable.

Note: while space does not allow for a discussion of all possible situations, two common situations and their respective recovery procedures are:

Nose High – airspeed low, trend decreasing:

1) Lower the nose and simultaneously apply full power while leveling the wings.
2) Establish straight and level flight at cruise power on original flight path and altitude.

Nose Low – airspeed high, trend increasing:

1) Reduce power.
2) Level the wings.
3) Smoothly raise the nose to level flight altitude.
4) Establish straight and level flight at cruise power on original flight path and altitude.

References: Airplane Flying Handbook FAA-H-8083-3C

Instrument Flying Handbook FAA-H-8083-15B

FAA instrument Rating Airmen Certification Standards (ACS)

Emergency Descent (PA28-161 Warrior)

Description: A descent from a higher altitude in the case of an emergency such as: incapacitated passenger, smoke filling the cockpit, and fire.

Objective: To descend from a higher altitude in the shortest amount of time as safely as possible.

Procedures:

1) Perform clearing turns
2) Position report including: location, altitude, heading, airspeed, and intentions.
3) Power idle
4) Pitch for flap operation speed 103KIAS
5) Configure flaps full (airspeed will decrease further, continue pitching for 103 kts)
6) Establish bang angle between 30°-45°
7) Allow for maximum descent

Note: Airspeed not to exceed 103KIAS

8) Execute applicable checklist as appropriate (engine fire, electrical fire etc.)

Recovery (500 AGL)

1) Roll wings level
2) Pitch for the horizon
3) Add full power
4) Retract flaps (one by one as necessary)
5) Continue to climb to desired altitude)
6) Set power to cruise power
7) Fuel pump off

Note: transition to emergency approach and landing procedures if required.

Note: steps 1-3 are designed to maximize safety and avoid collisions with aircraft at lower altitudes. In a real world situation requiring an emergency descent, the priority is to initiate the descent as soon as possible while still practicing anti-collision precautions to maximum extent possible.

Note: In real world engine fire situation, the fuel pump would not be turned on.

References: Airplane Flying Handbook FAA-H-8033-3B

Emergency Descent (PA28-181 Pilot 100i)

Description:	A descent from a higher altitude in the case of an emergency such as: incapacitated passenger, smoke filling the cockpit, and fire.
Objective:	To descend from a higher altitude in the shortest amount of time as safely as possible.
Procedures:	9) Perform clearing turns 10) Position report including: location, altitude, heading, airspeed, and intentions. 11) Power idle 12) Pitch for flap operation speed 102KIAS 13) Configure flaps full (airspeed will decrease further, continue pitching for 102 kts) 14) Establish bang angle between 30°-45° 15) Allow for maximum descent **Note: Airspeed not to exceed 102KIAS** 16) Execute applicable checklist as appropriate (engine fire, electrical fire etc.) Recovery (500 AGL) 8) Roll wings level 9) Pitch for the horizon 10) Add full power 11) Retract flaps (one by one as necessary) 12) Continue to climb to desired altitude) 13) Set power to cruise power 14) Fuel pump off **Note: transition to emergency approach and landing procedures if required.** **Note: steps 1-3 are designed to maximize safety and avoid collisions with aircraft at lower altitudes. In a real world situation requiring an emergency descent, the priority is to initiate the descent as soon as possible while still practicing anti-collision precautions to maximum extent possible.** **Note: In real world engine fire situation, the fuel pump would not be turned on.**
References:	Airplane Flying Handbook FAA-H-8033-3B

SECTION IX: Slow Flight, Stalls and Spins

Maneuvering During Slow Flight

Description:	After clearing turns are completed, the airplane is maneuvered at an airspeed such that controllability is minimized to the point where the aircraft is operated in the area of reverse command, typically 5-10 knots above 1G stall speed. The maneuver should be accomplished in straight flight, turns, climbs, and descents using various flap configurations.
Objective:	To teach the student to recognize changes in airplane flight characteristics and control effectiveness at critically slow airspeeds in various configurations while maintaining positive airplane control at all times.
Procedures:	1) Clear the area by performing clearing turns. 2) After completing clearing turns, reduce power to 1500 RPM; maintain heading and altitude while slowing to the critically slow airspeed. 3) Extend flaps below Vfe. 4) As airspeed approaches Vso +5-10, power is adjusted to control altitude and pitch is adjusted to maintain airspeed. 5) Turn, climbs, and descents using bank angles of no greater than standard rate are performed as directed by the instructor while maintaining a critically slow airspeed. 6) Recovery is initiated by applying takeoff power and adjusting pitch attitude to maintain altitude while retracting flaps. 7) Resume normal cruise or as directed.
References:	FAA Private and Commercial Airmen Certification Standards Airplane Flying Handbook FAA-H-8083-3C

Note: Flight with continued or repeated stall horn/annunciator alerts will be avoided. Upon stall horn/ annunciator activation, stall recovery procedures will be implemented.

Power-Off Stalls

Description:	The airplane is maneuvered to a critically slow airspeed in straight flight or turning flight in a power-off configuration. A descent is established, and the angle of attack is then increased until an imminent stall (initial buffet or loss of control effectiveness) or the full stall occurs.
Objective:	To develop the student's ability to recognize the indications leading to an imminent or full stall while making an approach to landing and to make prompt, positive and effective recoveries with a minimum loss of altitude.
Procedures:	1) Perform clearing turns and make a radio call on OU traffic prior to starting the maneuver. 2) Reduce power to 1300-1500, maintain heading and altitude while slowing to normal approach speed. 3) Extend flaps to the landing position below Vfe. 4) Upon reaching normal approach speed, establish 400-600fpm descent. 5) Smoothly adjust the pitch to an attitude that will induce an imminent stall. 6) Maintain coordinated flight. 7) Maintain a pitch attitude that will induce an imminent or full stall (as directed). For imminent stalls, maintain pitch attitude until the initial buffet or a rapid decay of control effectiveness is experienced. For full stalls, maintain pitch attitude until a sudden loss of control effectiveness, excessive sink rate with full up elevator, or uncontrollable pitch down occurs. 8) Recover by decreasing the angle of attack, leveling the wings with coordinated use of aileron, rudder, and applying full power. 9) Retract the flaps while adjusting the pitch attitude to minimize altitude loss. 10) Accelerate to the normal cruise or climb as necessary to an appropriate altitude.
References:	FAA Private and Commercial Airmen Certification Standards Airplane Flying Handbook FAA-H-8083-3C

Power-On Stalls

Description:	The airplane is maneuvering to a critically slow airspeed in straight flight or turning flight in a power-on configuration. The angle of attack is then increased until an imminent stall (initial buffet or loss of control effectiveness) or the full stall occurs.
Objective:	To develop the student's ability to recognize the indications leading to an imminent or full stall in power on situations and to make prompt and effective recoveries with a minimum loss of altitude.
Procedures:	1) Perform clearing turns and make a radio call on OU traffic prior to starting the maneuver 2) Reduce power to idle and maintain heading and altitude while establishing a takeoff or climb configuration and airspeed as directed. 3) At Vr, simultaneously increase the pitch attitude to a stall attitude and apply full power. **Note: Avoid excessively high pitch attitudes.** 4) Maintain coordinated flight. 5) For imminent stalls, maintain the stall pitch attitude until the initial buffet or a rapid decay of control effectiveness is experienced. For full stalls maintain the stall pitch attitude until a sudden loss of control effectiveness is experienced, excessive sink rate with full up elevator, or uncontrollable pitching occurs. 6) Recover by decreasing the angle of attack, leveling the wings with coordinated use of aileron and rudder, and applying full power. 7) After recovery is complete, accelerate to normal cruise or climb as necessary.
References:	FAA Private and Commercial Airmen Certification Standards Airplane Flying Handbook FAA-H-8083-3C

Spins

Note: This maneuver is not authorized in any OU airplane.

Description: The airplane is maneuvered into an aggravated stall condition during which uncoordinated control use is accomplished in a manner that produces a spin entry.

Objective: To develop the student's ability to recognize flight situations that lead to spin entries and to recover from spin entries and spins.

Procedures:

Entry Procedures:

1) Climb to at least 6000' AGL and clear the area by performing clearing turns.
2) Set up a power off stall entry (power on stall entry may also be used)
3) As the airspeed and pitch attitude approach stall conditions, smoothly apply full aft elevator control with ailerons neutral.
4) Just prior to stall "break", apply full rudder in desired direction of spin.
5) A slight burst of power may assist spin entry.
6) Hold the rudder and elevator fully deflected until initiating recovery.
7) Initiate recovery after one to three turns.

Note: Recovery must be completed no lower than 4000' AGL

Recovery Procedures:

1) Retard power to idle.
2) Neutralized ailerons.
3) Apply and hold full opposite rudder.
4) Briskly apply positive forward-elevator movement to break the stall.
5) Hold these control inputs until rotation stops.
6) As rotation stops, neutralize the rudder.
7) Smoothly return to level flight from the resulting dive.

References: Airplane Flying Handbook FAA-H-8083-3C

FAA CFI Airmen Certification Standards (ACS)

Accelerated Stalls

Description:	The Airplane is maneuvered to an airspeed that is below Va. A constant bank is established and angle of attack is adjusted to maintain altitude inducing an imminent stall.
Objective:	To develop the student's ability to determine the stall characteristics of the airplane and develop the ability to instinctively recover at the onset of a stall at other-than-normal stall speeds or flight attitudes.
Procedure:	1) Select altitude that allows maneuver to be completed no lower than 3000' AGL. 2) Perform clearing turns, fuel selector to appropriate position. 3) Reduce power to 2000RPM(warrior) slowing down to 85kts (warrior). 4) Upon reaching entry speed, establish a 45° bank either direction. 5) Smoothly and firmly adjust pitch to maintain altitude and induce stall. 6) Maintain coordinated flight. 7) Maintain stall pitch attitude until the initial buffet or rapid decay of control effectiveness is experienced. 8) Recover by simultaneously decreasing back pressure, increasing power, and leveling the wings. 9) After recovery is complete, accelerate to normal cruise or climb as necessary.
Reference:	FAA Commercial Airmen Certification Standards. Airplane Flying Handbook FAA-H-8083-3C

SECTION X: Performance Maneuvers

Steep Turns

Description:	360° turns are performed in both directions using a steep bank angle.
Objective:	To develop the student's smoothness, coordination, orientation, division of attention, and control techniques while executing high performance turns.
Procedures:	1) Clear the area of other traffic. 2) Establish an appropriate altitude and Va airspeed (mixture as required). 3) As the bank angle steepens, adjust back elevator pressure to maintain a level altitude and adjust power to maintain airspeed. 4) Maintain a 50° bank angle, altitude, and airspeed during the turn. 5) Be constantly alert for other traffic while performing this maneuver. 6) Plan to lead the rollout so the turn is stopped after 360° of heading change and immediately initiate a 360°turn in the opposite direction. 7) After completion of the second turn, return to straight and level flight at cruise airspeed.
References:	FAA Private and Commercial Airmen Certification Standards Airplane Flying Handbook FAA-H-8083-3C

Chandelles

Description:	A 180° maximum performance climbing turn.
Objective:	To develop the student's control techniques at varying airspeeds and altitudes while remaining oriented and coordinated.
Procedures:	1) Clear the area of other traffic. 2) Establish an appropriate airspeed at or below Va. 3) Select a prominent reference point off the wing tip. Consider wind direction. 4) Smoothly apply full power 5) Enter a coordinated 30° bank turn into the direction of the reference point and wind. 6) Once a 30° bank is established, simultaneously increase pitch attitude at a constant rate so as to obtain a maximum pitch attitude at the 90° point which, when maintained, will result in the airplane slowing to just above stalling speed at the completion of 180° turn. 7) Maintain coordinated control inputs throughout maneuver. 8) Maintain a constant 30° bank angle during the first 90° of the turn. 9) After passing the 90°point, begin a slow, constant rate roll out in order to arrive at the wings-level position just as the 180° turn is completed. 10) After the 90° point, back pressure should be added as required to maintain a constant pitch attitude until reaching the 180° point. 11) Upon reaching the 180° point, the airplane should be held momentarily within 5 knots of stalling speed with the wings level. 12) Maintain altitude and accelerate to cruise by decreasing pitch attitude to the horizon. **<u>Note:</u> This maneuver should be done into the wind to avoid drifting away from the reference point and/or the practice area.**
References:	Airplane Flying Handbook FAA-H-8083-3C FAA Commercial Pilot Airmen Certification Standards (ACS)

Lazy Eights

Description:	Two 180° turns are completed in opposite directions. Each turn includes a climb and a descent in a symmetrical pattern; the nose of the airplane scribing a horizontal eight on the horizon.
Objective:	To develop the proper coordination of the flight controls across a wide range of airspeed and attitudes.
Procedures:	1) Clear the area for other traffic. 2) Establish an appropriate attitude at or below Va. 3) Select reference points and consider wind direction. 4) Begin a gradual climbing turn in the direction of the 45° reference point. Plan a climbing turn so that at the 45°point, the airplane is at its maximum pitch attitude and a 15° bank angle is rolled in with the bank slowly and steadily increasing. 5) The bank angle should continue to increase until it reaches a 30° bank angle at the 90° visual reference point. The pitch attitude should be slowly decreasing. 6) As the airplane passes through the 90° reference point on the horizon. The bank angle should be at 30° and the airspeed should be 5-10 KIAS above stall. 7) Both the pitch attitude and the bank angle continue to decrease so that, at the 135° point, the pitch attitude reaches its lowest point and approximately 15° bank angle remains. 8) As the airplane passes through the 135°point, the roll out is continued and the pitch attitude is slowly increased so that the airplane returns to straight and level flight at the entry altitude and airspeed at the 180° point. 9) Continue immediately into a similar turn in the opposite direction. **Note: this maneuver should be done into the wind to avoid drifting away from the reference point and/or the practice area.**
References:	Airplane Flying Handbook FAA-H-8083-3C FAA Commercial Pilot Airmen Certification Standards (ACS)

Steep Spirals

Description:	The airplane is maneuvered in a descending turn, around a point on the ground that causes the ground track to be a circle.
Objective:	To develop the student's ability to make a descending turn maneuvering the airplane around a point on the ground in a manner that causes the ground track to be a circle.
Procedures:	1) Perform clearing turns and radio calls. 2) Establish an altitude of at least 4500' AGL. 3) Check gear and flaps up. 4) Determine wind direction and set-up for downwind entry. 5) Select a small but prominent reference in a sparsely populated area. 6) Crossing point, apply carb heat reduce power to idle, slow to best glide (73 KIAS Warrior) (78 knots Pilot 100I) and roll into a maximum of 60° of bank. 7) Vary bank angle to maintain constant ground track of about 1/8-mile radius from your center point. 8) Make at least three turns recovering on the entry heading and an altitude of more than 1500' AGL. 9) During each up-wind turn clear the engine by briefly advancing the throttle to at least 1700 RPM. 10) Be constantly on the alert for traffic while performing this or any maneuver. 11) Plan to depart on entry heading unless otherwise instructed.
References:	Airplane Flying Handbook FAA-H-8083-3C FAA Commercial Pilot Airman Certification Standards (ACS)

SECTION XI: Ground Reference Maneuvers

Eights-On-Pylons

Description: The airplane is maneuvered between and then around two prominent reference points (pylons) in the form of a figure "8". During the turn portion the pylon is kept in the same position relative to the airplane's lateral axis by adjusting both altitude and bank angle.

Objective: To develop the student's ability to maneuver the airplane accurately while dividing his/her attention between the flight path and the selected points on the ground.

Procedures: **Note: consideration must be given to the possibility of a low altitude engine failure while performing this maneuver. Select an area with an adequate landing site.**

1) Perform clearing turns and make radio calls
2) Establish pivotal altitude and airspeed below Va/Vo
3) Determine the wind direction.
4) Select two prominent reference points (pylons). They should be on a line perpendicular to the wind and far enough apart to allow 3-5 seconds of straight-and-level flight between turns.
5) Enter the "8" at the pivotal altitude by flying diagonally downwind between the pylons. The first turn is made into the wind.
6) As the line of sight reference approaches the pylon enter a bank as necessary to properly position the reference line on the pylon.
7) As the turn is continued, hold the line of sight reference on the pylon by adjusting bank and altitude. (lower altitude upwind and higher altitude downwind.)
8) Begin rolling out from the left when diagonally downwind to the right.
9) Once wings level, fly 3-5 seconds until reference line crosses right wing.
10) Complete maneuver to the right.
11) Be constantly alert for other traffic and obstacles while performing this maneuver.
12) To complete the maneuver, exit on 45 degrees downwind to the left.

Note: pivotal altitude may be approximated by squaring ground speed, then dividing by 11.3 for Knots, or 15 for MPH.

References: Airplane Flying Handbook FAA-h-8083-3C

FAA Commercial Pilot Airman Certification Standards (ACS)

Rectangular Course

Description:	The airplane is maneuvered over a predetermined rectangular ground path. The pilot will maneuver the airplane utilizing necessary wind corrections so as to parallel the sides of the rectangle at a uniform distance. Turns at the corners of the rectangle are constant radius turns.
Objective:	To develop the student's ability to maneuver the airplane over a predetermined ground path while dividing attention inside and outside the airplane.
Procedures:	**<u>Note:</u> consideration must be given to the possibility of a low altitude engine failure while performing this maneuver. Select an area with adequate landing site available.** 1) Perform clearing turns and radio calls 2) Establish an altitude between 600' – 1000' AGL and establish cruise power and airspeed. 3) Select a prominent rectangular field bound by four section lines whose sides are approximately equal to a typical traffic pattern. 4) The field should be in a sparsely populated area. 5) Enter the maneuver on downwind. 6) Establish the proper crab angle to maintain a uniform distance from the field boundaries. (about ½ - ¾ mile) 7) Be constantly alert for other traffic while performing this maneuver. 8) Vary the bank angle to maintain a constant radius during the turns.
References:	Airplane Flying Handbook FAA-H-8083-3C FAA Private Pilot Airman Certification Standards (ACS)

S-Turns Across a Road

Description:	The airplane is maneuvered through a series of 180° turns in opposite directions over a predetermined reference line. The ground path should be a series of half circles of equal size alternately executed on the upwind side and the downwind side of the reference line.
Objective:	To develop the student's ability to maneuver the airplane over a predetermined ground path while dividing attention inside and outside the airplane.
Procedures:	**Note: consideration must be given to the possibility of low altitude engine failure while performing this maneuver. Select an area with adequate landing site available.**

1) Perform clearing turns and radio calls.
2) Establish an altitude between 600' and 1000' AGL that is at least 500' above obstacles and establish cruise airspeed.
3) Determine the wind direction.
4) Select a road or other straight reference line running approximately perpendicular to the wind (in a sparsely populated area).
5) Enter the maneuver downwind on a ground track perpendicular to the reference line.
6) At a point directly over the reference line, start a 180°constant radius turn, modifying the bank angle as necessary to compensate for wind drift. At the completion of the turn, the airplane will be directly over and perpendicular to the reference line with wings level.
7) Immediately upon completion of the first turn, an identical turn is begun on the upwind side of the reference line in the opposite direction. (The airplane should roll through level flight as the reference line is passed).

Do not stop in the wings level position.

8) Be constantly alert for other traffic while performing this maneuver.
9) The bank angle should be adjusted as necessary throughout the maneuver to achieve two complete semicircles of equal radius. Bank angle should not exceed 45°.

References:	Airplane Flying Handbook FAA-H-8083-3C FAA Private Pilot Airman Certification Standards (ACS)

Turns Around a Point

Description:	The airplane is maneuvered around a point on the ground in a manner that causes the ground track to be a circle.
Objective:	To develop the student's ability to maneuver the airplane over a predetermined ground path while dividing attention inside and outside the airplane.
Procedures:	**<u>Note:</u> consideration must be given to the possibility of low altitude engine failure while performing this maneuver. Select an area with an adequate landing site available.** 1) Perform clearing turns and radio calls. 2) Establish an altitude between 600' and 1000' AGL that is at least 500' above obstacles and establish cruise airspeed (mixture as required). 3) Determine the wind direction. 4) Select a small but prominent reference point in a sparsely populated area. 5) Enter downwind and start a turn around the point. 6) Adjust the bank angle as necessary to correct for the effects of wind in order to maintain a constant radius. 7) Be constantly alert for other traffic while performing this maneuver. 8) Plan to depart on the entry heading unless otherwise instructed.
References:	Airplane Flying Handbook FAA-H-8083-3C FAA Private Pilot Airman Certification Standards (ACS)

SECTION XII: Cross Country Flight Planning

TIME/DISTANCE/FUEL TO DECEND

Parameters:

Descent Rate: 500 FPM

Descent Speed: 90 KTS

Power Setting: 2100 RPM

Time: (Cruise ALT – TPA)/ 500

Distance: (90kts x Descent time)/60 + 2 *

Fuel burn (9.2 GPH) x Descent time

*Allows traffic pattern entry 2 miles from airport

Example: Cruise ALT = 4500 feet TPA = 2200 feet

Time: (4500-2200) / 500 fpm = 4.6 min

Distance E6B : Set speed at 90, Above 4.6 read 7 NM, add 2 to get 9 NM

Fuel Set Fuel to 9.2, Above 4.6 read .7 gallons

WHY this method?

The POH has you begin your descent fairly far out from the destination. The OU method has the pilot maintain cruise airspeed until closer to the destination and then descent at a slower airspeed. The OU method also keeps the aircraft at or under Va for all phases of flight.

VFR Cross Country Flight Planning

Materials Needed: Sectional, plotter, E6B, pencil, Chart supplement, X-C log, aircraft POH, and W&B

I) Sectional Chart
   a. Plan to use a new flight log for each leg of your cross country.
   b. Plot a straight – line course from center of the departure airport to the center of the arrival airport.
   c. Select checkpoints along the course, preferably on your side of the aircraft, within 5 nm of the course, about every 10-15 miles. Good checkpoints are easily identifiable, i.e. towns, hard-surface airports, industrial plants, major highways, large rivers and lakes. Bad checkpoints would be using the windfarm which has no identifiable boundary.
   d. Record checkpoints, nm between them and total leg lengths on the flight log.
   e. Choose the best altitude based on the hemispherical rule, winds, and elevation along the route.
   f. Record wind direction and speed and temperature at chosen altitude (may require interpolation)
   g. Find an intersection of the course and a line of longitude and measure the true course.
   h. Using an E6B, determine TH, MH, CH, GS.
   i. Using the calculated GS, fill in the ETE between checkpoints and total for the leg.
   j. Using the ETE and leg lengths, fill in GPH between checkpoints and total for the leg.

II) Airport Facility Directory
   a. Note the following information on the flight log for each airport you will be flying to:
      i) All communication frequencies in order of their use
      ii) All navigation frequencies in order of their use (Ex: VORs along your route)
      iii) Arrival airport field elevation, traffic pattern altitudes (and if it is standard or non-standard)
      iv) All other pertinent data such as runway lengths, FSS frequencies, TFRs, forecast weather, remarks, etc.

III) Weight and Balance
   a. Calculate a complete weight and balance using the assigned aircraft, ensure you are within CG and weight limits (remember that is not always possible to completely fill the fuel tanks on every flight)
   b. Use actual passenger weights, when possible, otherwise use standard weight values.
   c. Fill in all values on the weight and balance form.

IV) Weather briefings
   a. Call FSS at 1-800-WX-BRIEF (992-7433)
   b. Dial 1 at the end of the recording to speak to a briefer.
   c. Ask for a “standard” weather briefing, and give him/her to following information: (having a completed flight plan form in front of you will simplify this process)
      i) Type of flight plan (VFR/IFR)
      ii) Aircraft identification
      iii) Aircraft type
      iv) Departure airport
      v) Route of flight
      vi) Destination
      vii) Altitude to be flown
      viii) Estimated departure time
      ix) Estimated time en route
      x) Advise the briefer you are a student pilot (note during poor weather conditions the briefer will be reluctant to provide a complete briefing – if this happens just tell them your instructor requires you to receive a “full“ briefing).

d. Obtain actual weather conditions and forecasts for your departure airport, en route and destination airport
e. Obtain winds aloft at 3000' MSL, 6000; MSL, and 9000' MSL and temperatures aloft at 6000' MSL and 9000' MSL (use higher if necessary)
f. Obtain current altimeter setting and surface temperature closest to your departure airport
g. Ask for NOTAMs, PIREPs, and military advisories

V) Pressure/density altitude

a. Obtain current altimeter setting and surface temperature from Westheimer AWOS (405)325- 7302, if possible, Cruise Aviation's WSI terminal, or a briefer
b. Compare the current altimeter setting with 29.92 in hg. and compute the difference
    i) If the current altimeter setting is less than 29.92 in hg, a positive correction factor exists. Multiply the difference by 1000 and add this value to your planned cruise altitude to determine pressure altitude aloft. Add this value to the field elevation to determine field pressure altitude.
    ii) Example: today's altimeter setting is 28.79 in hg
        (1) Subtract this from 29.92 in hg = 1.13, then multiply this by 1000 =1130, and add this number to 1182 to get pressure altitude of 2300 at the surface
    iii) If the current altimeter setting is greater than 29.92 in hg, a negative correction factor exists. Multiply the difference by 1000 and subtract this value from your planned cruise altitude to determine pressure altitude aloft. Subtract this value from the field elevation to determine field pressure altitude.
    iv) Example: Today's altimeter setting is 30.27 in hg
        (1) Subtract this from 29.92 =.35 then multiply this by 1000 = 350 and subtract this number from 1182 to get a pressure altitude of 800 at the surface (note these figures are rounded for simplicity)
c. Compare the field temperature with the temperature aloft and determine if the temperature lapse rate is standard or non-standard. If nonstandard compute/interpolate the temperatures at the altitudes to be used and use these temperatures in your planning.
d. Be sure to include density altitude computations in your aircraft performance calculations if temperature is above standard
e. Density altitude can be determined by using pressure altitude and today's temperature from an E6B or a density altitude chart

VI) Aircraft Performance

a. Take-off Distance
    i) Add or subtract your pressure altitude correction factor to/from field elevation to get field pressure altitude
    ii) Determine surface temperature and headwind/crosswind component.
    iii) Determine density altitude
    iv) Compute take-off distance using the chart which best computes take-off performance over a 50' barrier using zero degrees flaps.
    v) Note computed distance on sheet
b. True airspeed
    i) Add or subtract your pressure altitude correction factor to/from your cruising altitude to get pressure altitude in cruise flight
    ii) Correct surface temperature or the winds aloft temperature to get an outside air temperature at your cruising altitude. (Remember air temperature decreases 2 degrees Celsius or 3.5 degrees Fahrenheit per 1000' of altitude gain.) Determine density altitude at your cruising altitude.

iii) Compute true airspeed using a 65% power setting
iv) Note calculated true airspeed on flight log and weight & balance form
v) Compute fuel flow from chart using 65% power and record on flight log

c. Power Setting
i) Using a flight computer, determine the density altitude at your cruising level based on previously computed pressure altitude and temperature at your cruising altitude. Use this density altitude figure if outside air temperature is not a computed variable on chart.
ii) From the power setting/engine performance chart, compute power setting in cruise flight at 65% power and note on flight log.

d. Landing Distance
i) Add or subtract correction factor to the field elevation to get field pressure altitude. Compute field density altitude if necessary, or if large temperature rise is expected before landing.
ii) Use known/estimated surface temperature and surface winds
iii) Using the landing distance 50' obstacle chart, compute the landing distance required.
iv) Note distance on weight and balance form

VII) Flight Computer
a. Wind side
i) Using True course and True airspeed, compute WCA (wind correction angle) and ground speed for each leg of the flight
ii) Note ground speed and wind correction angle for each let on flight log

b. Calculator Side
i) Determine time for each leg using G.S. and distance, and note on flight log
ii) Determine time between each checkpoint for ETE and note on flight log
iii) Add 5 minutes for each takeoff and landing to allow for pattern entry
iv) Determine total time for each leg and note on flight log
v) Determine total fuel to be used using previously computed total time and GPH; note on flight log
vi) Determine endurance using usable gallons on board and GPH; note on flight log

VIII) Flight Plan
a. Fill out remainder of flight plan form (see AIM Ch. 5)
b. Call FSS at 1-800-WX –BRIEF. Advise the briefer you want to file a VFR flight plan and read the information from the flight plan from to him/her.

IFR Cross Country Flight Planning

Note: the pilot should monitor weather information during the 12 hours prior to the flight. Develop a mental picture of the weather covering the area of the flight. Determine, using the 1-2-3 rule, if an alternate airport will be needed. If so, including the alternate airport in you flight planning.

I) Route Planning/Enroute Chart
   a) Use the "Route Advisor" function in Foreflight to determine if a preferred route exists for your route of flight. If so, this should be your 1st choice for your route of flight. (**Note: whether it is a High or Low altitude route.)**
   b) Review your departure and destination airport for DPs and STARs. These should be your 2nd choice for your route of flight.
   c) Should a preferred route or DP/STAR not be available, determine route to be used using airway routes whenever available. Use the most direct route when possible and/or practical.
   d) List the fixes/checkpoints for each leg along the route on a flight log. Note each one that is also a compulsory reporting point.
   e) Determine the course for each leg and note on flight log. Also note the navigation aid and frequency to be used for each leg.
   f) Note the distance between each fix or checkpoint on the flight log.
   g) Note any en route weather service facilities and their frequencies along the route of flight on flight log
   h) Check all NOTAMs thoroughly ensuring no navigation aid outages or approach plate changes.

II) Approach Plates
   a) Determine which approach plates are necessary and verify you have a current set.
   b) Study the plates for your departure, arrival, and alternate airports.
      i) Note the IAF for your desired approaches, missed approach procedures, initial altitudes, approach facilities, and their frequencies, approach category and times for your aircraft, directions for each approach, and minimum altitude and visibility for each approach.
   c) Note any en route facilities and frequencies as well as feeder routes shown on the chart.
   d) Be familiar with fixes along your route and the expected approaches based on the most recent weather data available.

III) Follow steps II-III under VFR cross-country planning

Lost Procedures

Description: The pilot becomes aware that the airplane is off course and in an unknown position. Procedures are initiated that will determine the new location and correct back on course.

Objective: To develop the skills and proficiency necessary to determine airplane position and the corrections needed to re-establish the airplane on the proper course.

Lost procedures:

- Confess
- Climb
- Conserve
- Communicate
- Comply

Procedures:

1) Maintain positive airplane control at all times.
2) Use topographical features and /or navaids to determine position:

Topographical features:

1) Reset the heading indicator.
2) Turn the sectional chart to match airplane heading.
3) Look outside the airplane for prominent landmarks.
4) Match the landmarks to the chart.

Navaids:

GPS:

1) Program GPS direct to KOUN (or desired alternate)

VOR:

1) Tune and identify available stations VOR/NDB.
2) Locate the airplane's current position using radials/bearings/DME.
3) In the event the above procedures fail to determine airplane position, contact the nearest ATC facility or FAA for radar assistance or DF steer.

Note: consideration must be given to alternatives other than continuing to the planned destination considering the amount of time that has elapsed and the distance off course. Remaining fuel available and weather conditions must also be considered when determining action to be taken.

References: Airplane Flying Handbook FAA-H-8083-3C

Diversion Checklist

Diversion Checklist - Updated 1/24

- GPS - Direct new destination _____ TIME_____
- Turn to GPS Heading
  - Note DG heading for GPS course _____
- Advise ATC/FSS/NOTAMS?
- Adjust altitude for Hemispherical Rule

If Field in-sight Skip to Airport Info

- Distance _____ GS_____ ETA_____ Fuel_____
- Airport Info: From Sectional
  - CTAF_____
  - AWOS_____
  - Field Elevation_____
  - TPA_____
- ***Complete In Range Checklist***
- Determine best runway and pattern entry (DRAW)

SECTION XIII: Instrument Procedures

Instrument Cockpit Check

Description: The instrument cockpit check starts prior to taxi with a systematic check of all radios and navigation equipment. The magnetic compass and gyro instruments are checked while taxiing to the active runway

Objective: To ensure the proper operation of all instruments, avionics and navigation equipment prior to flight

Procedures: **Avionics and Navigation equipment check**

1) Turn the master switch on.
2) Check the audio panel.
3) Check both communication radios (transmit and receive)
4) Set a frequency in #2 nav to check for the identifier and proper needle deflection
5) Verify transponder in ALT mode
6) Verify AHRS alignment
7) Verify no red X's on PFD instruments
8) Check HSI and bearing pointer
9) Clock operating and set to correct time
10) Altimeter – set-to current altimeter setting with a maximum error +-75'.
11) Vertical speed indicator – should indicate zero
12) Circuit breakers –check
13) Alternate static source – normal position
14) magnetic compass – bowl full of fluid, card moves freely, checked on know heading, deviation card intact
15) Check gyro instruments
    A) Turn coordinator – slip skid indicator moves into taxi turns, inclinometer moves opposite
    B) HSI – checked with magnetic compass and operating properly
    C) Attitude indicator – no red X

References: Instrument Flying Handbook FAA-H-8083-15B

Basic Attitude Instrument Flying

Description:	Straight and level flight climbs, descents, and turns are accomplished by establishing and maintaining appropriate control forces by reference to the control instruments and cross – checking the airplane's performance by reference to the performance instruments.
Objective:	To develop the student's ability to maintain airplane control solely by reference to instruments.
Procedures:	1) Properly cross-check the instruments. a. Consider control, performance, primary, and supporting instruments when cross-checking. b. Include engine and navigation instruments. c. Avoid fixation, omission, and emphasis. 2) Properly interpret the instruments that were cross-checked. a. Interpret instrument indications/trends/rates. b. Recognize malfunctioning instruments. c. Understand the instrument limitations and errors. 3) Effectively control the airplane. a. Set the control instruments using pitch, bank, power and trim. b. Monitor the performance instruments. c. Make corrections/modifications as necessary by reference to the control instruments.
References:	Instrument Flying Handbook FAA-H-8083-15C FAA Instrument Rating Airman Certification Standards (ACS)

Constant Airspeed Climbs

Description:	A constant airspeed is maintained during a climb at a fixed power setting by establishing and maintaining the appropriate pitch attitude.
Objective:	To develop the Student's proficiency in the basic skills required for instrument flight.
Procedures:	1) Simultaneously apply climb power and establish the approximate pitch attitude, which will result in the desired climb airspeed. 2) Maintain the climb attitude by reference to the attitude indicator and cross-check the airspeed indicator for the desired performance. 3) Adjust the pitch trim to neutralize control pressures. 4) Make small pitch adjustments by reference to the attitude indicator as necessary to achieve and maintain the desired airspeed. 5) Lead the level off by approximately 10% of the rate of climb, reducing the power to the cruise power setting when the airspeed increases to within 5 knots of the cruise airspeed.
References:	Instrument Flying Handbook FAA-H-8083-15B FAA Instrument Rating Airman Certification Standards (ACS)

Constant Airspeed Descents

Description:	A constant airspeed is maintained during a descent at a fixed power setting by establishing and maintaining the appropriate pitch attitude.
Objective:	To develop the student's proficiency in the basic skills required for instrument flying.
Procedures:	1) Simultaneously reduce the power and establish the approximate pitch attitude, which will result in desired airspeed during the descent. 2) Maintain the pitch attitude by reference to the attitude indicator and cross-check the airspeed indicator for the desired performance. 3) Adjust the pitch trim to neutralize control pressures. 4) Make small pitch adjustments by reference to the attitude indicator as necessary to achieve and maintain the desired airspeed. 5) Lead the level off by approximately 10-20% of the rate of descent, increasing the power to the cruise power setting as initiate the level off.
References:	Instrument Flying Handbook FAA-H-8083-15B FAA Instrument Rating Airman Certification Standards (ACS)

Constant Rate Climbs

Description:	A constant rate and a constant airspeed is maintained during a climb by establishing and maintaining the appropriate pitch attitude and power setting.
Objective:	To develop the student's proficiency in the basic skills required for instrument flight.
Procedures:	1) Simultaneously establish the appropriate climb attitude and power setting which will result in the desired climb rate and airspeed. 2) Maintain the climb attitude by reference to the attitude indicator and cross-check the airspeed indicator and the vertical speed indicator for the desired performance. 3) Adjust the pitch trim to relieve elevator control pressure. 4) Make small pitch adjustments by reference to the attitude indicator as necessary to achieve and maintain the desired climb rate. Make small power changes by reference to the tachometer to achieve and maintain the desired climb airspeed. 5) Lead the level off by approximately 10% of the rate of climb, reducing power to the cruise power setting when the airspeed increases to within 5 knots of cruise airspeed.
References:	Instrument Flying Handbook FAA-H-8083-15B FAA Instrument Rating Airman Certification Standards (ACS)

Constant Rate Descents

Description:	A Constant rate and a constant airspeed are maintained during a descent by establishing and maintaining the appropriate pitch attitude and power setting.
Objective:	To develop the student's proficiency in the basic skills required for instrument flights
Procedures:	1) Simultaneously, establish the approximate attitude and power setting which will result in the desired descent rate and descent airspeed. 2) Maintain the descent attitude by reference to the attitude indicator and crosscheck the airspeed indicator and the vertical speed indicator for the desired performance. 3) Adjust the pitch trim to relieve elevator control pressure. 4) Make small pitch adjustments by reference to the attitude indicator as necessary to achieve and maintain the desired descent rate. Make small power adjustments by reference to the tachometer to achieve and maintain the desired airspeed. 5) Lead the level of by approximately 10-20% of the rate of descent, increasing power to the cruise power setting as level off is initiated.
References:	Instrument Flying Handbook FAA-H-8083-15B FAA Instrument Rating Airman Certification Standards (ACS)

Magnetic Compass Turns

Description:	Turns to specific headings are accomplished by reference to the magnetic compass.
Objective:	To develop the student's proficiency in making turns to specific headings by reference to the magnetic compass.
Procedures:	1) Determine the amount of northerly turning error that is appropriate to your desired heading. The amount of error reaches a maximum on headings of north and south and is roughly equivalent to the airplane's latitude. The amount of error decreases to approximately zero on headings of east or west. 2) Establish a turn in the appropriate direction using a bank angle of 15°-18°. (standard rate) 3) When turning to a northerly heading, lead the roll-out by the amount of the turning error plus the lead needed to roll out of the bank. 4) When turning to a southerly heading, roll-out past the desired heading by an amount equivalent to the turning error minus the lead needed to roll out of the bank. 5) Check the accuracy of the new heading and correct if necessary.
References:	Instrument Flying Handbook FAA-H-8083-15B

Timed Turns to Magnetic Compass Headings

Description:	Turns to specific magnetic compass headings will be accomplished by accurately timing standard or half-standard rate turns.
Objective:	To develop proficiency in making timed turns to specific compass headings with and without the use of altitude indicator or the heading indicator.
Procedures:	1) Determine the number of degrees to be turned. 2) Compute the time needed to accomplish the turned a standard rate (3 degrees per second) or half-standard rate (1 and ½ degrees per second). 3) Begin the timing as the roll is started. Establish the appropriate rate or turn. 4) Maintain a standard or half-standard rate of turn as appropriate. 5) When the appropriate time has elapsed, roll-out at the same rate as the roll-in. 6) Check the new heading and correct if necessary.
References:	Instrument Flying handbook FAA-H-8083-15B FAA Instrument Rating Airman Certification Standards (ACS)

IFR Departure Procedures

Description:	The airplane is maneuvered after takeoff to proceed on course as directed by ATC.
Objective:	To develop the skills and proficiency necessary to depart an airport under IFR conditions and transition to the en route phase of the flight.
Procedures:	1) Prior to takeoff, set navigation and communication radios as needed to comply with the departure clearance. 2) Record the takeoff time. 3) After receiving takeoff clearance, follow the departure clearance and any special ATC instructions. If cleared for a "SID", refer to the chart for procedures. 4) When departing from an uncontrolled airport, adhere to the "clearance void time" and contact ATC as appropriate. 5) Maintain geographic orientation and verify navigation frequency identification as soon as possible. 6) Note the time passing designated checkpoints. 7) Intercept the appropriate en route course.
References:	Instrument Flying Handbook FAA-H-8083-15B Current FAR/AIM

VOR Tracking

Description:	The airplane is maneuvered along a VOR radial solely by reference to flight instruments. Heading adjustments will be made to correct for the effect of wind.
Objective:	To develop the student's proficiency in following a VOR radial while correcting for wind effect.
Procedures:	1) When the desired course has been intercepted, with the CDI centered, maintain a heading corresponding to the OBS setting. 2) When a definite off-course indication occurs, turn 20°in the direction of the CDI deflection. 3) Maintain the new track until the CDI begins to center. 4) As the CDI centers, turn 10° back toward the selected course. This establishes a wind correction angle of 10°. If the CDI remains centered, maintain the heading. The wind correction angle is correct. 5) If the CDI begins to show deflection in the direction opposite the initial deviation, the 10°wind correction was too great. Turn to a heading parallel to the course selected and allow the airplane to drift back onto the desired radial. When the CDI centers, establish a 5° wind correction angle. 6) 5° corrections are normally adequate to keep the CDI centered after the initial wind corrections. However, exact center needle accuracy may require corrections less than 5 °. **<u>NOTE:</u> If the first 20°of heading change fails to change the direction of the CDI movement within a reasonable period of time, an additional 20° heading change should be made (a strong crosswind is indicated). As the CDI re-centers, establish a 20° correction angle. Adjust this angle as necessary, using the bracketing technique described above.**
References:	Instrument Flying Handbook FAA-H-8083-15B FAA Instrument Rating Airman Certification Standards (ACS)

VOR Intercepts

Description:	The airplane is maneuvered to intercept and track a predetermined VOR radial either inbound or outbound.
Objective:	To develop proficiency in intercepting and tracking predetermined VOR radials inbound or outbound.
Procedures:	1) Reset the heading indicator by reference to the magnetic compass 2) Tune and identify the VOR station. 3) Turn the airplane to a heading parallel to the desired course. 4) Center the course deviation indicator (CDI) with a “TO "or “FROM” indication as appropriate and note the course “TO” or “FROM” the facility as indicated by the Omni bearing selector (OBS). 5) Set the OBS to the desired course. 6) To intercept a course 30° or less form the present course, turn 45°in the direction of CDI deflection. To intercept a course more than 30° from the present course turn 90°in the direction of the CDI deflection. 7) Maintain the intercept heading until the CDI starts to center. 8) As the CDI centers, turn on course and begin tracking procedures to correct for wind. **<u>Note:</u> as proficiency is gained and familiarity with the relationship between intercept angle, distance from the station and the magnitude of off course deviation is developed, the course parallel orientation method may be omitted and intercept angles other than 45° and 90° should be used as appropriate.**
References:	Instrument Flying Handbook FAA-H-8083-15B FAA Instrument Rating Airman Certification Standards (ACS)

DME Arc Procedures

Description: The airplane will be maneuvered to intercept and follow a predetermined circular course at a set distance from a VORTAC/VOR-DME facility. The DME distance is maintained until intercepting the desired approach course.

Objective: To develop the skill and proficiency necessary to maneuver the airplane along a DME arc and intercept final approach courses from DME arcs.

Procedures:

1) Fly inbound or outbound on the selected course/heading to intercept the arc.
2) Tune and identify the VORTAC/VOR-DME frequency in VOR2 and set the final approach course.
3) Set bearing pointer 2 to VLOC2. Use the bearing pointer feature to track your progress every 10°.
4) Determine the proper direction to turn when intercepting the arc. Use the 90°wing tip position on the OBS or HSI to determine the initial heading to fly after intercepting the arc.
5) Start the turn to fly the arc when the airplane is ½ mile from the arc intercept.
6) Wait until the tail end of the bearing pointer reaches 10° past the initial radial.
7) Turn the airplane 10° so that the next selected radial is crossed at a 90° angle.
8) When the tail of the bearing pointer reaches the next 10°, turn the airplane another 10°.
9) Wind correction for arc deviation is accomplished by:
   a. A wind causing the arc distance to increase requires a heading correction of approximately 10° for each 1 mile deviation.
   b. A wind causing the arc distance to decrease requires you to maintain the present heading until the arc is intercepted.
10) Approach course interception is accomplished by turning to an appropriate intercept heading upon crossing the depicted lead radial. For procedures not depicting a lead radial, lead the turn by approximately 5°.

References: Instrument Flying Handbook FAA-H-8083-15B

FAA Instrument Rating Airman Certification Standards (ACS)

Holding Procedures

Description:	The airplane is maneuvered to enter a standard or non-standard pattern using the AIM recommended entry procedure. Wind correction is applied to keep the airplane in protected airspace and on the inbound course. The straight and level legs are timed in order to establish the desired inbound leg length.
Objective:	To develop the skill and proficiency necessary to enter and become established in a published or non-published holding pattern.
Procedures:	1) Determine the type of entry to be used based on the airplane heading upon arrival over the holding fix. 2) Slow to the desired airspeed and establish the proper configuration when within 3 minutes of the holding fix. 3) Upon crossing the holding fix execute the appropriate entry procedure recommended by the AIM and report to ATC as appropriate. 4) Intercept the inbound course and establish the wind correction angle as soon as possible. 5) Start outbound timing when abeam the fix or at the completion of the outbound turn if the abeam point cannot be determined. 6) Adjust the outbound heading (normal 2x the inbound wind correction angle) so that the course intercept occurs at the completion of the inbound turn. 7) Adjust outbound timing so that the inbound leg is one minute long. 8) Begin inbound timing at the completion of the inbound turn. 9) Leave holding according to ATC instructions. **<u>Note:</u> DME holding- DME holding is the same as above except that the legs are measured in miles. Timing is not required but wind correction angles must still be used. If the inbound course is towards the NAVAID and the fix distance is 16NM and the leg length is specified as 4NM, then the end of the outbound leg will be reached when the DME reads 20NM. If the inbound course is away from the NAVAID the end of the outbound leg will be reached when the DME reads 12NM.**
References:	Instrument Flying Handbook FAA-H-8083-15B FAA instrument Rating Airman Certification Standards (ACS) Current FAR/AIM

ILS Approach

Description: The airplane is established on the final approach course and at glideslope intercept the descent to the DA or circling minimum is begun. The approach is terminated either with a landing or missed approach as appropriate.

Objective: To develop the skills and proficiency necessary to execute ILS approaches.

Procedures:

1) Prior to reaching the IAF, select, tune, identify, and confirm the operational status of ground and airplane navigation equipment to be used for the approach.
2) Brief the approach plate and check frequencies, courses, altitudes and missed approach procedures.
3) Initiate the pre-landing checklist and slow to final approach course speed after reaching one of the following positions as appropriate:
   a. Crossing the initial approach fix.
   b. Within 30°of the final approach course.
   c. With 5 miles of the final approach fix.

Note: these are guidelines designed to get the airplane properly set up for the final approach. ATC requirements may dictate modification of these guidelines.

4) Complete a procedure turn, if appropriate
5) Intercept the final approach course at the proper altitude and airspeed.
6) Upon intercepting the glideslope begin descent to the DH.
7) Note the time crossing the outer marker.
8) Use 5°-10° wind correction angles to track the localizer outside the outer marker and 2°-5° after crossing the outer marker inbound.
9) Adjust pitch altitude to maintain the glideslope and power to maintain the correct airspeed.
10) Be alert for equipment malfunctions or course/glideslope deviations that may require executing a missed approach.
11) Upon reaching the DA or circling minimums as appropriate:
    a. Make a normal landing if the provisions of FAR 91.175 are met
    b. Execute the missed approach.

References: Instrument Flying Handbook FAA-h-8083-15B

FAA instrument Rating Airman Certification Standards (ACS)

RNAV Approach – Precision

Description: The airplane is established on the final approach course and at glideslope intercept the descent to the DH or circling minimum is begun. The approach is terminated either with a landing or missed approach as appropriate.

Objective: To develop the skills and proficiency necessary to execute RNAV approaches.

Procedures:

1.) Prior to reaching the IAF, load the approach on the GPS through the procedures page, ensure the correct approach and initial fix (or vectors to final) are selected, finally activate the approach procedure. Ensure the CDI is set to GPS and set the final approach course on the CDI.
2.) On the bottom left of the GNX375 ensure the GPS is in LPV or LNAV/VNAV mode, if still in terminal mode monitor the screen to ensure the correct mode is displayed prior to the FAF.
2) Brief the approach plate and check courses, altitudes and missed approach procedures.
3) Initiate the pre-landing checklist and slow to final approach course speed after reaching one of the following positions as appropriate:
   d. Crossing the initial approach fix.
   e. Within 30°of the final approach course.
   f. With 5 miles of the final approach fix.

Note: these are guidelines designed to get the airplane properly set up for the final approach. ATC requirements may dictate modification of these guidelines.

4) Complete a procedure turn, if appropriate
5) Intercept the final approach course at the proper altitude and airspeed.
6) Upon intercepting the glideslope begin descent to the DH.
7) Note the time crossing the outer marker.
8) Use 5°-10° wind correction angles to track the localizer outside the outer marker and 2°-5° after crossing the outer marker inbound.
9) Adjust pitch altitude to maintain the glideslope and power to maintain the correct airspeed.
10) Be alert for equipment malfunctions or course/glideslope deviations that may require executing a missed approach.
11) Upon reaching the DH or circling minimums as appropriate:
   c. Make a normal landing if the provisions of FAR 91.175 are met
   d. Execute the missed approach.

References: Instrument Flying Handbook FAA-h-8083-15B

FAA instrument Rating Airman Certification Standards (ACS)

RNAV Approach – Non Precision

Description: The airplane is established on the final approach course and at the final approach fix or the beginning of the final approach segment, descent to the MDA or circling minimum is begun. The approach is terminated either with a landing or a missed approach as appropriate.

Objective: To develop the skill and proficiency necessary to execute RNAV approaches.

Procedures:

1) Prior to reaching the IAF, load the approach on the GPS through the procedures page, ensure the correct approach and initial fix (or vectors to final) are selected, finally activate the approach procedure. Ensure the CDI is set to GPS and set the final approach course on the CDI.
2) Brief the approach plate and check courses, altitudes and missed approach fix.
3) On the bottom left of the GNX375 ensure the GPS is LNAV mode, if still in terminal mode monitor the screen to ensure the correct mode is displayed prior to crossing the FAF.
4) Initiate the pre-landing checklist and slow to final approach course speed after reaching one of the following positions as appropriate:
    a. Crossing the initial approach fix.
    b. Within 30° of the final approach course.
    c. Within 5 miles of the final approach fix.

Note: ATC requirements may dictate modification of these guidelines.

5) Complete a procedure turn, if appropriate.
6) Intercept the final approach course at the proper altitude and airspeed.
7) At the final approach fix note the time and descent to the MDA or step-down fix as appropriate.
8) Be alert for equipment malfunctions or course deviations that may require executing a missed approach.
9) Initiate a level-off to stay at or above the MDA until the requirements listed in FAR 91.175 are met and a normal landing can be made.
10) If the requirements of FAR 91.175 cannot be met, execute the missed approach.

References: Instrument Flying Handbook FAA-H-8083-15B

FAA Instrument Rating Airman Certification Standards (ACS)

FAR 91.175

VOR Approach

Description: The airplane is established on the final approach course and at the final approach fix or the beginning of the final approach segment, descent to the MDA or circling minimum is begun. The approach is terminated either with a landing or a missed approach as appropriate.

Objective: To develop the skill and proficiency necessary to execute VOR approaches.

Procedures:

11) Prior to reaching the IAF, select, tune, identify, and confirm the operational status of ground and airplane navigation equipment to be used for the approach.
12) Brief the approach plate and check frequencies, courses, altitudes and missed approach fix.
13) Initiate the pre-landing checklist and slow to final approach course speed after reaching one of the following positions as appropriate:
    a. Crossing the initial approach fix.
    b. Within 30° of the final approach course.
    c. Within 5 miles of the final approach fix.

Note: these are guidelines designed to get the airplane properly set up for the final approach. ATC requirements may dictate modification of these guidelines.

14) Complete a procedure turn, if appropriate.
15) Intercept the final approach course at the proper altitude and airspeed.
16) At the final approach fix note the time and descent to the MDA or step-down fix as appropriate.
17) Be alert for equipment malfunctions or course deviations that may require executing a missed approach.
18) Initiate a level-off to stay at or above the MDA until the requirements listed in FAR 91.175 are met and a normal landing can be made.
19) If the requirements of FAR 91.175 cannot be met, execute the missed approach.

References: Instrument Flying Handbook FAA-H-8083-15B

FAA Instrument Rating Airman Certification Standards (ACS)

FAR 91.175

Terminal Approach

Description:	An instrument approach using a navigation aid located on the airport. Normally there is not a final approach fix associated with the approach. The approach may be conducted in either a radar or non-radar environment. Upon completing a procedure turn or being radar vectored to the final approach course, a descent to the MDA is begun when course guidance is assured. Final approach timing is not necessary since a missed approach is initiated at station passage.
Objective:	To develop the skill and proficiency necessary to execute terminal approaches.
Procedures:	1) Prior to reaching the IAF, select, tune, identify, and confirm the operational status of ground and airplane navigation equipment to be used for the approach. 2) Review the approach plate and check frequencies, courses, altitude and missed approach procedures. 3) Initiate the pre-landing checklist and slow to the final approach course speed after reaching one of the following positions as appropriate: a. Crossing the initial approach fix. b. Within 30° of the final approach course. c. Within 10 miles of the airport. **<u>Note:</u> these are guidelines designed to get the airplane properly set up for the final approach. ATC requirements may dictate modifications of these guidelines.** 4) Complete the procedure turn, as appropriate. 5) Intercept the final approach at the proper altitude and airspeed. 6) Upon achieving proper on-course indication and at the proper distance from the airport begin the descent to the MDA. 7) Be alert for equipment malfunctions or course deviations that may require executing a missed approach. 8) Initiate a level-off to stay at or above the MDA until the requirements of FAR 91.175 are met and a normal landing can be made. 9) If the requirements of FAR 91.175 cannot be met, execute the missed approach.
References:	Instrument Flying Handbook FAA-H-8083-15B FAA instrument Rating Airman Certification Standards (ACS)

No-Gyro Radar Vector Approach

Description:	The airplane is established on the final heading as assigned by ATC and at the desired approach speed. The descent to the MDA is begun when instructions are received from ATC. The approach is terminated either with a landing or a missed approach as appropriate.
Objective:	To develop the skill and proficiency necessary to execute radar instrument approach procedures during operations with an inoperative heading indicator.
Procedures:	1) Comply with turn, heading and altitude instructions as assigned by ATC. 2) Initiate the pre-landing checklist and slow to final approach course speed upon reaching a point 5 miles from the final descent point. 3) ATC will advise when to make heading changes by issuing turn instructions such as “turn left”, “stop turn”. 4) Upon receiving instructions from ATC to begin final descent, initiate a descent to the MDA. 5) Course guidance is provided by ATC in the form of heading and turn instructions. If executing a PAR approach, glideslope instructions are also provided by ATC. 6) Be alert for equipment malfunctions or course deviations that may require executing a missed approach. 7) Initiate a level-off to stay at or above the MDA until the requirements listed in FAR 91.175 are met and a normal landing can be made. 8) If the requirements of FAR 91.175 cannot be met, execute the missed approach.
References:	Instrument Flying handbook FAA-H-8083-15B Current FAR/AIM

SECTION XIV: Multi-Engine Maneuvers

Slow Flight

Description: After clearing turns are completed the airplane is maneuvered at an airspeed such that controllability is minimized to the point just above the stall warning horn. The maneuver should be accomplished in straight flight, turns, climbs and descents using carious flap configurations.

Objective: To teach the student to recognize changes in airplane flight characteristics and control effectiveness at critically slow airspeeds in various configurations while maintaining positive airplane control at all times.

Procedures:

Pre-Maneuver Flow

1) Perform clearing turn
2) Announce altitude, heading and airspeed

Procedure

1) Set power to 13”-15”Hg MP
2) Extend landing gear below 140kts
3) Full flaps inside the white arc
4) Propellers full forward before 90kts
5) Maintain 60kts of airspeed
6) Set power to 20” Hg MAP
7) Pitch for airspeed/power for altitude

Recovery

1) Set full power
2) Retract 1st flap
3) Retract the landing gear before reaching 109kts

Note: Landing gear cannot be retracted above 109kts

4) Retract the remaining flaps
5) Set normal cruise power

References: FAA Commercial Airman Certification Standards (ACS)

Airplane Flying Handbook FAA-H-8083-3C

Power-Off Stall

Description: The airplane is maneuvered to a critically slow airspeed in straight flight or turning flight in a power off configuration. A descent is established and the angle of attack is then increased until an imminent stall (initial buffet or loss of control effectiveness) or the full stall occurs.

Objective: To develop the student's ability to recognize the indications leading to an imminent or full stall while making an approach to landing and to make prompt, positive and effective recoveries with a minimum loss of altitude.

Procedures:

Pre-Maneuver Flow

1) Perform clearing turn
2) Announce altitude, heading and airspeed

Procedure

3) Set power to 13"-15"Hg MP
4) Extend landing gear below 140kts
5) Full flaps inside the white arc
6) Propellers full forward below 90kts
7) Maintain 85kts of airspeed
8) Set power to idle
9) Maintain a descent at 85kts and 500 fpm
10) Pitch up to induce imminent stall

Recovery

1) Set full power
2) Pitch for 82kts
3) Set flaps to 25°
4) Retract the landing gear before reaching 109kts

Note: Landing gear cannot be retracted above 109kts

5) Retract remaining flaps
6) Set normal cruise power.

References: FAA Commercial Airman Certification Standards (ACS)

Airplane Flying Handbook FAA-H-8083-3C

Power-On Stall

Description:	The airplane is maneuvering to a critically slow airspeed in straight flight or turning flight in a power on configuration. The angle of attack is then increased until an imminent stall (initial buffet or loss of control effectiveness) or the full stall occurs.
Objective:	To develop the student's ability to recognize the indications leading to an imminent or full stall in power-on situations and to make prompt and effective recoveries with a minimum loss of altitude.
Procedures:	Pre-Maneuver Flow 1) Perform clearing turn 2) Announce altitude, heading and airspeed Procedure 1) Set power to 13"-15"Hg MAP 2) Propellers full forward below 90kts 3) Maintain 75kts of airspeed 4) Set power to 18"Hg MAP 5) Pitch up to induce imminent stall Recovery 1) Maintain power at 18"Hg MAP 2) Pitch for 82kts 3) Set normal cruise power.
References:	FAA Commercial Airman Certification Standards (ACS) Airplane Flying Handbook FAA-H-8083-3C

Steep Turn

Description:	360° turns are performed in both directions using a steep bank angle.
Objective:	To develop the student's smoothness, coordination, orientation, division of attention, and control techniques while executing high performance turns.
Procedures:	1) Reduce power 2) Verify airspeed below Va 3) Establish a 50° bank 4) Power 19"-20"Hg MAP to maintain airspeed 5) Pitch for altitude during the turn 6) Relax back pressure and reduce power as you transition from one turn to the other in order to maintain PTS tolerances 7) To recover set power to 21"Hg MAP and 2400 RPM
References:	FAA Commercial Airman Certification Standards (ACS) Airplane Flying Handbook FAA-H-8083-3C

Emergency Descent

Description:	A descent from a higher altitude in the case of an emergency such as an incapacitated passenger, smoke filling the cockpit, or fire.
Objective:	To descend from a higher altitude in the shortest amount of time as safely as possible.
Procedures:	1) Preform clearing turns 2) Announce altitude, heading, and airspeed 3) Set power to flight idle 4) Propellers full forward 5) Extend landing gear below 140 kts. 6) Pitch for 140 kts to maximize descent rate 7) To recover raise the nose 8) Retract landing gear below 109 kts. 9) Set power to 21” Hg MAP 2400 RPM
References:	FAA Commercial Airman Certification Standards (ACS) Airplane Flying Handbook FAA-H-8083-3C

Drag Demonstration

Description: The aircraft will be configured in different high and low drag configurations and the performance will be monitored.

Objective: For the student to know how different configurations effect aircraft performance.

Procedures: **Note: Zero thrust is considered to be 10”Hg MAP and 2000RPM**

1) Power between 13”-15” Hg MAP
2) Propellers full forward below 90 kts
3) Airspeed intercept Vyse
4) Right cowl flap open
5) Left cowl flap closed
6) Right throttle set to full power
7) Left throttle set to 10” Hg MAP
8) Set up a 5° bank and use rudder as required to maintain directional control
9) Airspeed Vyse… note VSI
10) Airspeed Vyse-10 kts… note VSI
11) Airspeed Vyse +10 kts… note VSI
12) Airspeed Vyse
13) Extend landing gear… note VSI
14) Extend full laps… note VSI
15) Retract landing gear… note VSI
16) Retract flaps… note VSI
17) Left throttle to idle… note VSI

Recovery

18) Airspeed Vyse
19) Left throttle advance slowly to warm engine
20) Right throttle decrease slowly
21) Power set to 21” Hg MAP 2400 RPM
22) Right cowl flap closed

References: FAA Commercial Airman Certification Standards (ACS)

Airplane Flying Handbook FAA-H-8083-3C

Vmc Demonstration

Description: The aircraft will be maneuvered into an engine-out high angle of attack and low airspeed situation. Recovery will occur at the first sign of stall or VMC, whichever occurs first.

Objective: For the student to recognize a stall or VMC situation and recover properly.

Procedures:

Pre-Maneuver

1) Gear up
2) Rudder trim neutral
3) Flaps up
4) RT Cowl flap

Procedure

5) Set power 13”-15”Hg MAP
6) Propellers full forward below 90 kts
7) Airspeed intercept Vyse
8) Right throttle full power
9) Left throttle set to idle
10) Set up a 5° bank and use rudder as required to maintain directional control
11) Increase pitch (airspeed reduction of 1 kt per second)
12) At first sign? of stall or loss of directional control
13) Lower pitch
14) Reduce right throttle
15) Lower pitch until above Vmc
16) Right throttle full power
17) Establish airspeed at Vyse

Recovery

18) Airspeed Vyse
19) Left throttle advance slowly to warm engine
20) Right throttle decrease slowly
21) Power set to 21” Hg MAP 2400 RPM
22) Right cowl flap closed

References: FAA Commercial Airman Certification Standards (ACS)

Airplane Flying Handbook FAA-H-8083-3C

Accelerated Stall

1) Procedure
    i. Set power 13”-15” Hg MAP
    ii. Airspeed 100 knots
    iii. Props full
    iv. Bank to 45 degrees
    v. Pull until stall warning horn, while maintaining altitude.
2) Recovery
    i. Roll to level wings
    ii. Full power

Short Field

1) Mid field downwind
    i. Gear Down (3 green, one in the mirror)
2) Abeam the numbers
    i. Set power 13”-15” Hg MAP
    ii. Airspeed 90 knots
    iii. Propellers full forward below 90 knots
    iv. One notch of flaps
3) Short final (Be stable no later than .5 from runway)
    i. Flaps full
    ii. Slow to 85/80 knots

Approach Procedures

Precision Approach

1) One dot above glideslope
    i. Gear down (3 green, one in the mirror)
    ii. Props Full
    iii. Flaps one notch
    iv. Approach speed 100 knots
2) Short final
    i. Flaps as necessary
    ii. Airspeed 90

Precision Approach Single Engine

1) One dot above glideslope
    i. Gear down (3 green, one in the mirror)
    ii. Confirm prop on operating engine is full
    iii. Approach speed 100 knots
    iv. Monitor performance (raise flaps and gear if you cannot maintain glideslope)
2) Short final
    i. Gear down if previously raised for performance requirements.
    ii. Flaps as necessary (2 flaps)
    iii. Airspeed 90

Non-Precision Approach

1) 1 miles prior to FAF
    i. Gear down (3 green, one in the mirror)
    ii. Props Full
    iii. Flaps one notch
    iv. Approach speed 100 knots
2) Short final
    i. Flaps as necessary
    ii. Airspeed 90

Non-Precision Approach Single Engine

1) 1 miles prior to FAF
    i. Gear down (3 green, one in the mirror)
    ii. Confirm prop on operating engine is full
    iii. Approach speed 100 knots
    iv. Monitor performance (raise flaps and gear if you cannot maintain altitudes)
2) Short final
    i. Gear down if previously raised for performance requirements
    ii. Flaps necessary (2 flaps)
    iii. Airspeed 90
    iv. Confirm prop on operating engine is full

SECTION XV: Flight Test Checklist

Flight Test Checklist

Part 61 applicants, see ACS for complete list

Bring to oral:

1) Pilot certificate
2) Medical certificate
3) Logbook (with instructor's endorsement)
4) Government issued photo ID
5) Syllabus ticket
6) Ground School graduation certificate for 141 course
7) Written test results
8) Current Aeronautical Chart
9) Airplane Information Manual/POH
10) Current FAR/AIM
11) E6B flight computer
12) Plotter
13) Calculator
14) Weight and Balance (completely filled out)
15) Standard weather brief
16) Cross-Country log (completely filled out)
17) Flight plan form (completely filled out)
18) Notice or disapproval from failed written or flight test, if applicable

In the Aircraft:

19) IFR Hood
20) Ensure proper documents are in the airplane

Additional items for instruments applicants:

1) Current instrument en-route charts
2) Current instrument approach charts

Additional items for CFI Applicants:

1) Flight instructor's Handbook
2) Airplane Flying Handbook
3) Appropriate ACS guides
4) Flight instructor certificate for those pursuing an additional rating.
5) Model airplane
6) Lesson plans
7) Any additional teaching aids deemed necessary.