Coyote Flight Centers, LLC

Private Pilot Ground School Syllabus

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List of Effective Pages/Index

Coyote Flight Centers, LLC
Ground School Course

FAA-APPROVED 6/29/2022 *Gordon D. Morris*

[i] This course syllabus utilizes the lesson plans contained in the Coyote Flight and Training Centers Private Pilot Flight and Ground Training Course approved by FAA Principal Operations Inspector William Fitzgerald on July 23rd, 2018.

FAA-APPROVED GORDON D MORRIS Digitally signed by GORDON D MORRIS Date: 2022.06.29 15:59:55 -05'00'

List of Revisions
Private Pilot Ground School Course

	Section(s)	Rev	Date	Description
Revision 1, 11/20/2020	i, ii, iii, 1, 2, 4, 6a, 6c, 6d	1	11/20/2020	Initial release of sections
	3, 7, 8, 10, 13, 16, 22, 23, 25, 26, 27, 28	1	1/30/2018	Included from Coyote Flight and Training Centers Private Pilot Flight and Ground Training Course approved by FAA Principal Operations Inspector William Fitzgerald on July 23rd, 2018.
	5, 6b	1	3/28/2018	Included from Coyote Flight and Training Centers Private Pilot Flight and Ground Training Course approved by FAA Principal Operations Inspector William Fitzgerald on July 23rd, 2018.
	18	2	3/28/2018	Included from Coyote Flight and Training Centers Private Pilot Flight and Ground Training Course approved by FAA Principal Operations Inspector William Fitzgerald on July 23rd, 2018.
	21	2	6/13/2018	Included from Coyote Flight and Training Centers Private Pilot Flight and Ground Training Course approved by FAA Principal Operations Inspector William Fitzgerald on July 23rd, 2018.
	29	1	5/16/2018	Included from Coyote Flight and Training Centers Private Pilot Flight and Ground Training Course approved by FAA Principal Operations Inspector William Fitzgerald on July 23rd, 2018.
Revision 2, 1/3/2022	1	2	1/3/2022	Changed primary address of flight school to "4107 Tradewinds Rd." Revised description of ground instruction facilities. Removed Amarillo International Airport and associated address from footer of all documents and replaced with "Coyote Flight Centers, LLC – Private Pilot Syllabus"
	2a, 3, 4, 5a-5b, 6a-6d, 7, 10, 13, 16, 21, 22, 23, 24, 25, 26, 27, 28, 29	2	1/3/2022	Removed Amarillo International Airport and associated address from footer of documents and replaced with "Coyote Flight Centers, LLC – Private Pilot Syllabus"
	2b	2	1/3/2022	Added temperature restrictions. Removed Amarillo International Airport and associated address from footer and replaced with "Coyote Flight Centers, LLC – Private Pilot Syllabus"
	8	2	1/3/2022	Moved PAVE and APE checklists to Aeronautical Knowledge portion of lesson. Removed Amarillo International Airport and associated address from footer and replaced with "Coyote Flight Centers, LLC – Private Pilot Syllabus"

Revision 2, 1/3/2022	18	3	1/3/2022	Changed typo on FAR 91.207 from “24” to “12”. Removed Amarillo International Airport and associated address from footer of all documents and replaced with “Coyote Flight Centers, LLC – Private Pilot Syllabus”
	21	3	1/3/2022	Removed Amarillo International Airport and associated address from footer and replaced with “Coyote Flight Centers, LLC – Private Pilot Syllabus”
Revision 3, 5/23/2022	All documents			Modified header of each lesson plan, added PPG (Private Pilot Ground) and lesson number to title of each lesson. Modified the footer of all documents, instead of “Section No.” now reads “Coyote Document No”
	01	3	5/23/2022	Corrected airport name in section entitled flight school from “Amarillo International” to “Tradewind”. Removed school address. Clarified description of Ground Instruction Facilities to specify the number of students per room. Corrected the words “training room” to properly refer to “briefing rooms”. Under facility descriptions, removed the words “contacting Flight Standards Service (AFS) facilities” and inserted the words “obtaining weather and pre-flight briefings”. Under student enrollment and records, specified that students should be given an enrollment certificate and a copy of the safety procedures.
	02	3	5/23/2022	Combined sections 02a Safety Policies and 02b. Weather limitations into one document. Corrected Safety Policy item No.3 to specify that aircraft may be inspected in the hangar but must be pulled out of the hangar prior to being started Corrected item No. 9 to specify that aircraft are to be hangered unless in use. Item No. 17 and Item No. 19 changed the word “pilot” to “instructor”. Item No. 18 and Item No. 20 changed “Amarillo, International” to “Tradewind”. Added Item No. 25 added “any deviation from these policies must be specifically authorized in writing by the Chief Instructor.”
	04	3	5/23/2022	Added column specifying “lesson no”. Changed Document no 21, to Document no 21a (Ground Lesson 08 - Emergency Procedures and Equipment Malfunctions). Added Document 29, lesson 09, Introduction to the E6B for 2.0 hrs. Changed total hours from 37 to 35.
	05a	3	5/23/2022	Corrected question no. 1 answer “b” to state “080° and 260° magnetic”.

Revision 3, 5/23/2022	05b	3	5/23/2022	Corrected question no. 4 answer c to say 7907 MSL. Question no 5, inserted figure 40 from FAA testing supplement. Corrected question 34 to specify KINK.
	07	3	5/23/2022	Split Coyote Document 7 into 7a – Ground, and 7b – Flight.
	08, 10, 13, 16	3	5/23/2022	Changed completion standard, now states "The lesson is considered complete when the student passes the stage 1 written exam (Coyote Document No. 05a rev 3) with a grade of 70% or better."
	18	4	5/23/2022	Under student pilots logbook endorsements, changed the word "requirements" to "limitations". Under 61.89, corrected "25NM leash with 25NM-50NM grey area" to "must remain within 25NM of the airport of departure". Under 61.93, corrected the definition of cross country and changed the words "training purposes" to "certification purposes". Under 61.113, changed "250" to "500". Under Instrument pilots 61.65, corrected the required times for instrument training. Added a note to clarify why private pilots should understand the requirements, privileges, and limitations of both the instrument and commercial certificates. Added 91.131, 91.135. Under 91.211, corrected the requirements for use of oxygen. Added, 91.225. Added to 830.5, "Any accident". Changed completion standard, now states "The lesson is considered complete when the student passes the stage 1 written exam (Coyote Document No. 05a rev 3) with a grade of 70% or better."
	21	4	5/23/2022	Split Coyote Document 21 into 21a – Ground and 21b – Flight.
	22	3	5/23/2022	Under Performance, removed duplicate "Takeoff and landing". Clarified Range Performance to encompass "Cruise range and endurance." Changed completion standard, now states "The lesson is considered complete when the student passes the stage 2 written exam (Coyote Document No. 05b rev 3) with a grade of 70% or better."
	23	3	5/23/2022	Changed completion standard, now states "The lesson is considered complete when the student passes the stage 2 written exam (Coyote Document No. 05b rev 3) with a grade of 70% or better."

Revision 3, 5/23/2022	25	3	5/23/2022	Under Service Outlets, FSS added www.1800wxbrief.com. Clarified all other types of service stations to be discontinued. Under area forecasts, clarified that area forecasts are a graphical presentation only. Changed completion standard, now states "The lesson is considered complete when the student passes the stage 2 written exam (Coyote Document No. 05b rev 3) with a grade of 70% or better."
	26, 27, 28	3	5/23/2022	Changed completion standard, now states "The lesson is considered complete when the student passes the stage 2 written exam (Coyote Document No. 05b rev 3) with a grade of 70% or better."
	29	3	5/23/2022	Added section entitled "Miscellaneous calculations". Changed completion standard, now states "The lesson is considered complete when the student passes the stage 2 written exam (Coyote Document No. 05b rev 3) with a grade of 70% or better."
Revision 4, 6/27/2022	i, ii, iii	4	6/27/2022	Updated to revision 4
	1	4	6/27/2022	Added school address to page 1
	4b	4	6/27/2022	Removed "flight lesson", "solo flight", and "simulator" from legend. Removed "flight" column from table. Added stage 1 and stage 2 objective and completion standards
	8, 10, 13, 16, 22, 23, 25, 26, 27, 28	4	6/27/3022	Revised completion standards
	18	5	6/27/2022	Revised completion standards
Revision 5, 6/28/2022	I, ii, iii	5	6/28/2022	Updated to revision 5
	7	4	6/28/2022	Added the word "standard" to "Completion"
	8, 10, 13, 16, 22, 23, 25, 26, 27,28, 29	5	6/28/2022	Added the word "standard" to "Completion"
	18	6	6/28/2022	Added the word "standard" to "Completion"
	21	5	6/28/2022	Added the word "standard" to "Completion". Corrected the Objective to state, "Prepare the student to analyze and respond to unexpected events in order to prevent serious bodily injury or death."

Coyote Flight Centers, LLC
Private Pilot Ground School
Training Course Outline

Flight School
Coyote Flight Centers, LLC located at Tradewind Airport in Amarillo, TX. It is owned and operated as:

Coyote Flight Centers, LLC
4107 Tradewind St
Amarillo, TX 79118

Course Title and Objective

1. This course is entitled Private Pilot Ground School. This ground school course will provide the student with the aeronautical knowledge necessary to meet the requirements for a private pilot certificate with an airplane category rating and a single-engine land class rating. The training syllabus provided contains ground school courses intended to provide students with aeronautical knowledge.

2. This TCO meets the curriculum requirements for a Private Pilot Ground School Course as defined in part 141 appendix B:

    a. 35 hours of ground school training
    b. Applicable Federal Aviation Regulations for private pilot privileges, limitations, and flight operations;
    c. Accident reporting requirements of the National Transportation Safety Board;
    d. Applicable subjects of the "Aeronautical Information Manual" and the appropriate FAA advisory circulars;
    e. Aeronautical charts for VFR navigation using pilotage, dead reckoning, and navigation systems;
    f. Radio communication procedures;
    g. Recognition of critical weather situations from the ground and in flight, windshear avoidance, and the procurement and use of aeronautical weather reports and forecasts;
    h. Safe and efficient operation of aircraft, including collision avoidance, and recognition and avoidance of wake turbulence;
    i. Effects of density altitude on takeoff and climb performance;
    j. Weight and balance computations;
    k. Principles of aerodynamics, power plants, and aircraft systems;

l. Stall awareness, spin entry, spins, and spin recovery techniques;
m. Aeronautical decision making and judgment; and
n. Preflight action that includes:
    i. How to obtain information on runway lengths at airports of intended use, data on takeoff and landing distances, weather reports and forecasts, and fuel requirements; and
    ii. How to plan for alternatives if the planned flight cannot be completed or delays are encountered.

Completion Standards
The student must demonstrate through written tests and appropriate records that he or she meets the aeronautical knowledge requirements necessary to obtain a private pilot certificate with an airplane category rating and a single-engine land class rating. Each individual must satisfactorily complete at least one stage of training within a time period of not more than 90 days.

Ground Instruction Facilities
Ground instruction facilities are described below. The rooms are located in the operations offices attached to the Coyote Flight Centers, LLC hangar located on Tradewind Airport, hangar no 2.

- Classroom 1: Dimensions are 20'x20' with two entry/exit doors. The room contains tables with chairs, a bookshelf with aviation related material, a 48"x72" whiteboard, and a media playback system. A maximum number of 12 students may be trained in this room at a time.
- Briefing room 1: Dimensions are 12’ x 8’ with a closeable door. The room contains 1 large desk and chairs. A maximum number of 3 students may be trained in this room at a time.
- Briefing room 2: Dimensions are 12’x 8’ with a closeable door. The room contains a desk with chairs and a Frasca 131 BATD. Briefing room 2 may be used for simulator training or classroom ground school but shall be exclusive to only one type of activity at a time.
- The classroom and briefing rooms are well lighted and the temperature is thermostatically controlled. Each room is well ventilated and conforms to the city of Amarillo building, sanitation and health codes. The rooms are designed and located so that students will not be distracted by instruction conducted in the other rooms or by flight and maintenance operations at the airport.
- The rest of the facilities consists of a 20’x20’ lobby, a main office, and a print room.
- WiFi is available throughout the entire facility and laptop computers are available for use by both students and instructors.

Airport
The Tradewind Airport is the main base of operations for training in this course. Flight training operations, including the dispatching of flights, will be solely at this airport. The airport has hard-surfaced runways and meets § 141.38 requirements for day and night flight operations. The airport has fuel and maintenance services available.

Facility Descriptions
The airport is equipped with a lounge and pilot briefing area for Coyote Flight Centers, LLC's students which may be used for cross country flight planning and/or pre-flight briefings. The briefing area has a computer with internet access for weather briefings. A telephone and internet connections are provided for obtaining weather and pre-flight briefings and are dedicated to be used exclusively by Coyote Flight Centers, LLC's students. The briefing areas are equipped with tables for planning purposes. The briefing area has electronic access to current aeronautical charts, including the current Aeronautical Information Manual (AIM). The local practice areas are displayed along with the local tower frequencies and airport dimensions on a bulletin board in the lounge.

Ground Trainers
This course does not utilize any FFSs, FTDs, or ATDs.

Airplanes
This course of training will not require the use of any aircraft.

Chief Instructor and Qualifications
The chief instructor for this course will be Joshua A. Collier.

His qualifications meet or exceed the following:

- Hold a current flight instructor's certificate (airplane single engine land)
- Have at least 1000 hours PIC time in an airplane
- 2 years flight training experience with a minimum of 500 hours of flight instructor experience
- 1 year work experience at a part 141 school

Assistant Chief Flight Instructor and Qualifications
An Assistant Chief Instructor will not be used.

Instructor Qualifications
Each instructor assigned to teach any portion of this course must be the holder of at least a Basic Ground Instructor Certificate.

Training Syllabus
For the ground portion of the course, see section 4 – Private Pilot Ground Training Syllabus.

Student Enrollment and Records
An electronic copy of this training course syllabus, lesson plans, and safety procedures shall be made available to each student. Upon enrollment, each student shall be issued an enrollment certificate. Each enrolling student shall provide a valid driver's license (or state issued ID card) and either a passport or a birth certificate. Student records shall be stored electronically in a database. The program shall be password protected with varying levels of access to prevent unauthorized users from tampering with records. The program shall keep a dated record of each

class, hours logged, a grade sheet, and a digital signature to verify the integrity of each record. A physical copy of each student's record may be kept as a backup.

Safety Policies, Procedures, and Limitations

1. No aircraft may be flown or operated unless its status in the Aeroledger program reads "In-progress". If the aircraft is to be flown by a solo student or any place other than a designated practice area, the comment section of the Aeroledger reservation must contain a summary of the flight's intended locations.
2. Prior to any flight, the aircraft binder must be reviewed. Copies of all required documents and inspections must be in the binder and must be current.
3. Preflight and starting procedures will be carried out in accordance with the checklist provided with the aircraft. Pre-flight inspections may be conducted within the hangar, however the aircraft engine may NOT be started until the aircraft is outside of the hangar. The appropriate tow bar must be used when pulling the airplane from the hangar.
4. While taxiing near other aircraft a speed akin to a slow walk shall be maintained. No faster than a moderate walk shall be maintained when away from other aircraft.
5. A fire extinguisher is located in the lobby area of the front office. Additional fire extinguishers are located throughout the hangar. These are for use of all students or instructors in case of fire. Flight instructors will ensure all students know the locations.
6. Any aircraft discrepancies are to be noted in the "Squawk" section of the Aeroledger program. Students and their instructors will review these squawks prior to each flight. If any discrepancy is deemed to be an airworthiness or safety issue, by either the student or instructor, the aircraft is to be grounded until maintenance personnel return the aircraft to service.
7. Any aircraft undergoing maintenance must be marked as "grounded" or as "maintenance" in the Aeroledger program, and the key placed in the maintenance shop until after the aircraft is returned to service.
8. No flight may be made unless the present and forecast weather exceeds the company weather minimums as published below.
9. After each flight the aircraft shall be stopped with its nose pointed into the wind, and the keys returned to the key lockbox. Aircraft shall be hangered when not in use. If the aircraft is at an airport where no hangar is available, the aircraft is to be tied down and control yoke locked.
10. No aircraft shall be flown for more than three cumulative hours without a refueling stop. No flight shall begin without at least two hours of fuel in the fuel tanks. All flights should be terminated with at least one hour of fuel remaining in the fuel tanks.
11. All flights will avoid other aircraft using the right-of-way procedures in FAR 91.67. All pilots must review and be familiar with this regulation prior to any flight.
12. After takeoff, V_x or V_y may be used for the first 100'AGL. Afterwards, a less dramatic climb attitude should be used to allow the pilot to see over the nose of the aircraft. Shallow s-turns and other collision avoidance maneuvers should be used as necessary to prevent collisions.
13. Prior to each and every flight maneuver, clearing turns shall be performed.
14. Flight following and radar services shall be obtained and used during each and every flight.

15. Except for take-offs and landings, solo students shall perform all air work above two thousand five hundred feet AGL. Ground reference maneuvers may be practiced at nine hundred feet AGL.
16. The aircraft fuel boost pump shall be used during all maneuvers, when switching tanks, or when operating below one thousand feet AGL.
17. No student shall conduct any solo flight unless his/her primary instructor is available. If the student's primary instructor is not available, then the chief instructor may authorize another instructor to act in place of the primary instructor.
18. Students not actively involved in an authorized cross country must remain within 25NM of Tradewind airport, be transiting to or from designated practice areas, or within designated practice areas. Designated practice areas (Document No. 03) will be published in the main office and a copy will be placed in the aircraft binder.
19. Landings at unauthorized airports are not allowed except in case of an emergency. If a landing is made at an unauthorized airport, the aircraft should be taxied to a safe position on the ground, shut-down, and then secured. The student shall notify either their primary instructor or the chief instructor and await instructions.
20. No person may perform or authorize any maintenance except under supervision or direction from Coyote maintenance personnel. In the event an aircraft requires maintenance while away from Tradewind airport, the student is to secure the aircraft in a safe position, away from any runways, and contact either the Chief Flight Instructor or the Assistant Chief Flight Instructor for instructions.
21. Simulated emergency landings shall not be practiced unless an authorized instructor is on board. No simulated emergency shall proceed below 500 ft AGL unless over an airport runway where a normal landing can be made.
22. All flights must remain at least 1NM outside of the lateral boundaries of Pantex Nuclear Plant (P-47) unless at or above 5000' MSL.
23. Except in case of an emergency, pilots acting under the authorization of a student pilot certificate may only fly to approved airports. Approved airports include:
    a. Dalhart Municipal
    b. Hereford Municipal
    c. Hale County Municipal
    d. Lubbock International
    e. Clovis Municipal
    f. any airport specifically authorized in writing by the Chief Instructor
24. All students and pilots must read and be familiar with the most current copy of Coyote Company Policies as published on www.coyoteflight.com

Company Weather Limitations

Operation	Ceilings (AGL)	Visibility	Crosswind comp.	Gust factor	Maximum winds
VFR takeoffs and landings for **solo students**	3000 feet	20 statute miles	5 knots or as written in logbook by instructor	5 knots or as written in logbook by instructor	20 knots or as written in logbook by instructor
VFR takeoffs and landings for **certificated pilots** (not including approved flight instructors)	2000 feet	10 statute miles	No more than 50% of maximum demonstrated crosswind component	5 knots	No more than 25 knots including gusts
VFR takeoff and landings for **approved flight instructors**	1500 feet	5 statute miles	No more than maximum demonstrated crosswind component	15 knots	No more than 30 knots including gusts
IFR flight in IMC, including flight training with an **approved flight instructor**	1000 feet	5 statute miles	No more than 50% of maximum demonstrated crosswind component	10 knots	No more than 25knots including gusts

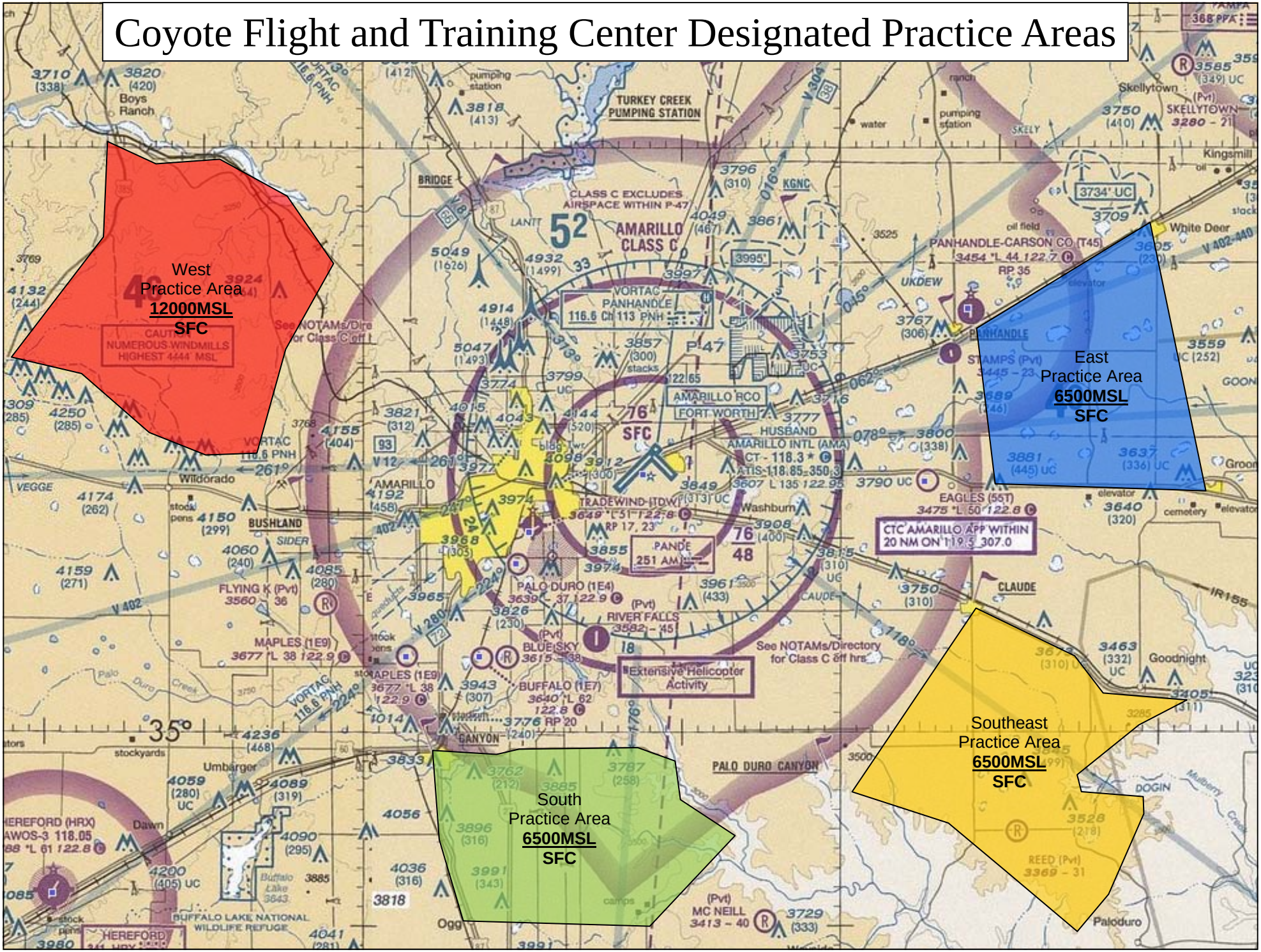
Temperature Limitations

Density altitude calculated	No takeoffs allowed if density altitude exceeds the approved takeoff performance chart in the POH.
Above 98F	Cross countries only. Low level flight training prohibited. Occupants must dress for hot weather (shorts, t-shirts, tennis shoes) and carry extra water.
Below 40F	• Cold weather clothing must be onboard the aircraft for all occupants. • A preheater shall be used prior to engine start. • Aircraft operators must read and be familiar with AvWeb - Whats to cold for a piston aircraft engine?, Lycoming SI 1505 Cold Wx Ops and Continental SIL 03-1 Cold Wx Ops
Below 30F	Approaches to landing shall be conducted under partial power in order to keep the engine warm and prevent "shock cooling" of the engine.
Below 20F	Flight operations are limited to steep turns, cross countries, ground reference maneuvers, or any regime of flight involving constant power settings.

Situation Specific Limitations

Taxiing	10 knots maximum taxi speed
Upper air maneuvers	All upper air maneuvers shall be performed a minimum of 2500 feet AGL
Spins	Spins shall be performed a minimum of 5000 feet AGL, in **approved aircraft**, and an **approved instructor** must be on board
Thunderstorms	No flight within 20NM of any convective activity present or forecast

Coyote Flight and Training Center Designated Practice Areas



Private Pilot Ground Training Syllabus[i, ii]

	Minimum Total Hours
Total ground:	39.0

Legend: Completion standards and objectives | Stage Check

Doc #	Lesson #	Title	Specific topics	Notes/Special emphasis	Ground
Stage 1 • Objective: Introduce the student to the concepts necessary for aeronautical decision making, aircraft operation, and federal guidance by which a pilot must abide. • Completion standard: Stage 1 is complete when the student passes the stage 1 written exam (Coyote Document No 05a, rev 3) with a grade of 70% or better.					
07a	01	Introduction to flight training	• Process for becoming a pilot • Registering for a student's pilot license • Registering for a medical • How to read a METAR and a TAF • Usage of a checklist • Pre-flight inspection techniques	• Complete only the ground portion of the lesson and tasks.	2.0
08	02	Airports and operational safety	• Airport signs and markings • Aeronautical decision making • The five hazardous attitudes • Wake turbulence avoidance	• Student should be able to read signs and marking • Student should memorize the PAVE and IM SAFE checklists • Student may elect to use the APE checklist in lieu of the PAVE checklist. • Student should memorize hazardous attitudes and antidotes	2.0
10	03	Aerodynamics, stability, and turning tendencies			4.0
13	04	Aircraft Systems		• Student should understand that alternator failure does not necessarily mean loss of engine power • Leaning of mixture for density altitude and best power • Signs of an engine overheating and how to cool an engine	4.0
16	05	Airspace			2.0
28	06	Aeronautical charts and supplements			2.0
18	07	Federal aviation regulations			4.0
05a		Private pilot written exam No. 1			2.0
Stage 2: • Objective: Prepare the student for solo flight and cross country operations • Completion standard: Stage 2 is complete when the student passes the stage 2 written exam (Coyote Document No. 05b rev 3) with a grade of 70% or better.					
21a	08	Emergency procedures and equipment malfunctions			2.0
29	09	Introduction to the E6B			2.0
22	10	Performance, Weight, and Balance			2.0
23	11	Weather Theory			2.0
25	12	Weather Services		• Weather services may be taught in conjunction with creating a flight plan	2.0
26	13	Cross country navigation, and flight planning		• Flight planning may be taught in conjunction with weather services • Flight plan should emphasize pilotage while utilizing calculations for determining the effects of wind	3.0

				• Student should be introduced to the E6B	
27	14	Aeromedical factors			2.0
05b		Private pilot written exam No. 2			2.0

[i] This course syllabus utilizes the lesson plans contained in the Coyote Flight and Training Centers Private Pilot Flight and Ground Training Course approved by FAA Principal Operations Inspector William Fitzgerald on July 23rd, 2018.
[ii] There are no prerequisites for this course.

Ground School Exam No. 1

- Topics:
  - Airports and operational safety
  - Aerodynamics, stability, and turning tendencies
  - Aircraft systems
  - Airspace
  - Federal regulations

1. The numbers 8 and 26 on the approach end s of the runway indicate that the runway is oriented approximately
   a. 008° and 026° true
   b. 080° and 260° magnetic
   c. 080° and 250° true

2. When approaching taxiway holding lines from the side with continuous lines, the pilot
   a. May continue taxiing
   b. Should not cross the lines without ATC clearance
   c. Should continue taxiing until all parts of the aircraft have crossed the lines

3. Red signs with white lettering indicate
   a. Areas on an airport where aircraft may not go
   b. Areas on an airport where aircraft may proceed only after obtaining permission
   c. Areas on an airport where aircraft may proceed but should use extreme caution

4. Yellow signs with black lettering indicate
   a. Directions to another taxiway or runway
   b. Areas where caution must be used to avoid collisions with other aircraft
   c. Areas where taxi speed should be kept to a minimum

5. Black signs with yellow lettering indicate
   a. The location of the aircraft
   b. Sections of the airport for ground operations
   c. Places where larger aircraft can pass smaller aircraft

6. Wingtip vortices are created only when an aircraft is
   a. Operating at high airspeeds
   b. Heavily loaded
   c. Developing lift

7. How does wake turbulence vortex circulate around each wing
   a. Inward, upward, and around each wingtip
   b. Inward, upward, and counter clockwise
   c. Outward, upward, and around each tip

8. During a night flight, you observe a steady red light and a flashing red light ahead and at the same altitude. What is the general direction of movement of the other aircraft?
    a. The other aircraft is crossing to the left
    b. The other aircraft is crossing to the right
    c. The other aircraft is approaching head-on

9. Prior to each maneuver, pilots should
    a. Check altitude, airspeed, and heading indications
    b. Visually scan the entire area for collision avoidance
    c. Announce intentions on the nearest CTAF

10. The most effective method for scanning for other aircraft for collision avoidance during daylight hours is to use
    a. Regularly spaced concentration on the 3, 9, and 12 o'clock positions
    b. A series of short, regularly spaced, eye movements to search each 10-degree sector
    c. Peripheral vision by scanning small sectors and utilizing off center viewing

11. A blue segmented circle on a sectional chart depicts which class of airspace?
    a. Class B
    b. Class C
    c. Class D

12. When a control tower at an airport within class D airspace ceases operation for the day, what happens to the airspace designation?
    a. The airspace designation normally will not change
    b. The airspace remains class D airspace as long as weather observer or automated weather systems are available
    c. The airspace reverts to Class E or a combination of Class E and G airspace during the hours the tower is not in operation

13. The radius of the outer area of Class C airspace is normally
    a. 10 NM
    b. 20 NM
    c. 30 NM

14. Who has the final authority to accept or decline land and hold short operations (LAHSO)?
    a. Pilot-in-command
    b. Owner/operator
    c. Second-in-command

15. With respect to the certification of airmen, which is a category of aircraft?
    a. Gyroplane, helicopter, airship, and free-balloon
    b. Airplane, rotorcraft, glider, lighter-than-air
    c. Single-engine land, single-engine sea, multi-engine land

16. The definition of nighttime is
    a. Sunset to sunrise
    b. 1 hour after sunset to 1 hour before sunrise
    c. The time between the end of evening civil twilight and the beginning of morning civil twilight

17. What is the duration of a standard aircraft registration in the U.S.?
    a. It never expires
    b. 2 years
    c. 3 years

18. What regulation governs aircraft maintenance?
    a. 14 CFR part 91
    b. 14 CFR part 43
    c. 14 CFR part 61

19. Preventative maintenance has been performed on an aircraft, what paperwork is required?
    a. A full, detailed description of the work done must be entered in the airframe logbook
    b. The date the work was completed, and the name of the person who did the work must be entered in the airframe and engine logbooks
    c. The signature, certificate number, and kind of certificate held by the person approving the work and a description of the work must be entered in the aircraft maintenance records

20. Which operation would be described as preventative maintenance?
    a. Servicing landing gear bearings
    b. Alteration of main seat support brackets
    c. Engine adjustments to allow automotive gas to be used

21. Is it legal to fly on the dealer's registration after purchasing an aircraft?
    a. Yes, the aircraft can be flown by the buyer for 30 days
    b. No, the aircraft cannot be flown by the buyer and has to be registered
    c. Yes the airplane can be flown by the buyer for 120 days

22. What documents must be in your personal possession or readily accessible in the aircraft while operating as PiC
    a. Certificates showing accomplishment of a checkout in the aircraft and a current biennial flight review along with a photo ID
    b. A pilot certificate with an endorsement showing accomplishment of annual flight review and a pilot logbook showing recency of experience
    c. An appropriate pilot certificate, a photo ID, and an appropriate current medical certificate if required

23. To act as pilot in command of an aircraft carrying passengers, the pilot must have made at least three takeoffs and three landings in an aircraft of the same
    a. Make and model
    b. Category and class, but not type
    c. Category, class, and type if a type rating is required

24. If a certificated pilot changes permanent mailing address and fails to notify the FAA airmen certification branch of the new address, the pilot is entitled to exercise the privileges of the pilot certificate for a period of only
    a. 30 days after the date of the move
    b. 60 days after the date of the move
    c. 90 days after the date of the move

25. In regard to privileges and limitations, a private pilot may
    a. Act as PiC of an aircraft carrying a passenger for compensation if the flight is in connection with a business or employment
    b. Not pay less than the pro rata share of the operating expenses of a flight with passengers provided the expenses involve only fuel, oil, airport expenditures, or rental fees
    c. Not be paid in any manner for the operating expenses of the flight

26. Where may an aircraft's operating limitations be found?
    a. On the airworthiness certificate
    b. In the current, FAA approved flight manual, approved manual material, markings, and placards, or any combination thereof
    c. In the aircraft airframe and engine logbooks

27. Safety belts are required to be properly secured about which persons in an aircraft and when?
    a. Pilots only, during takeoffs and landings
    b. Pilots during all phases of flight and passengers during taxi, takeoffs, and landings only
    c. Each person on board the aircraft during the entire flight

28. When two or more aircraft are approaching an airport for the purpose of landing, the right-of-way belongs to the aircraft
    a. That has the other to its right
    b. That is the least maneuverable
    c. At the lower altitude, but it shall not take advantage of this rule to cut in front of or overtake another

29. For VFR operations, a clearance must be obtained prior to entering which airspace?
    a. Class C
    b. Class E during VFR weather
    c. Class B

30. For VFR operations, two way radio communications must be established with the ATC facility having jurisdiction over the area prior to entering which class of airspace?
    a. Class C
    b. Class E
    c. Class G

31. What documentation must be on board an aircraft before it is legal to fly?
    a. Airworthiness, radio operator's certificate, and applicable service manuals
    b. Airworthiness, operating limitations, registration, weight and balance data
    c. Airworthiness, operating limitations, checklists, and applicable service manuals

32. What inspection(s) are required in order for an aircraft to be considered airworthy?
    a. Annual inspection, 100 hour inspection (if applicable), and the pitot/static inspection
    b. Annual inspection and pre-flight inspection
    c. Annual inspection, pre-flight inspection, and avionics inspection

33. If an aircraft is involved in an accident or an incident, where would a person find information pertaining to the proper course of action?
    a. NTSB 830
    b. FAR 43
    c. FAR 91

34. What is the purpose of wing flaps
    a. To enable the pilot to make steeper approaches to a landing without increasing the airspeed
    b. To relieve the pilot of maintaining continuous pressure on the controls
    c. To decrease wing area to vary lift

35. What is true concerning the primary flight controls?
    a. The effectiveness of each control surface increases with airspeed because there is more flow over them
    b. Only when all three primary flight controls move in sequence do the airflow and pressure distribution change over and around the airfoil
    c. Primary flight controls include ailerons, rudder, elevator, and trim systems

36. The term "angle of attack" is defined as the angle between
    a. The chord line of the wing and the relative wind
    b. Airplanes longitudinal axis and that of the air striking the airfoil
    c. Airplanes center line and relative wind

37. During a spin to the left, which wings are stalled?
    a. Both wings are stalled
    b. Neither wing is stalled
    c. Only the left wing is stalled

38. In what flight condition are the left-hand turning tendencies of an airplane the most pronounced?
    a. Low airspeed, high power, high angle of attack
    b. Low airspeed, low power, low angle of attack
    c. High airspeed, high power, high angle of attack

39. Which basic maneuver increases the load factor on an airplane?
    a. Climbs
    b. Turns
    c. Stalls

40. During flight, when are the indications of a magnetic compass accurate?
    a. Only in straight and level unaccelerated flight
    b. As long as the airspeed is constant
    c. During turns if the bank does not exceed 18°

41. The pitot system provides impact air pressure for which instrument?
    a. Altimeter
    b. Vertical speed indicator
    c. Airspeed indicator

42. An abnormally high engine temperature indication may be caused by
    a. The oil level being too low
    b. Operating with a too high viscosity oil
    c. Operating with an excessively rich mixture

43. What action(s) can a pilot take to cool an overheating engine?
    a. Re-lean the mixture, climb to a colder altitude, and reduce power
    b. Reduce power, increase airspeed, enrichen the mixture
    c. Reduce rate of climb and add power to increase airspeed

44. During the run-up at a high elevation airport, a pilot notices a slight engine roughness that is not affected by the magneto check but grows worse during the carburetor heat check. Under these circumstances, what would be the most logical initial action?
    a. Check the results obtained with a leaner mixture
    b. Taxi back to the flight lines for a maintenance check
    c. Reduce manifold pressure to control detonation

45. An electrical system failure (battery and alternator) occurs during flight. In this situation, you would
    a. Experience avionics equipment failure
    b. Probably experience failure of the engine ignition system, fuel gauges, aircraft lighting system, and avionics system
    c. Probably experience engine failure due to the loss of the engine-driven fuel pump and also failure of all radio equipment, lights, and all instruments requiring electrical current

Ground School Exam No. 2

- Topics:
  - Aircraft performance, weight, and balance
  - Weather theory
  - Weather services
  - Cross country flight planning and navigation
  - Aeromedical factors

1. What are the standard temperature and pressure values for sea level?
   a. 15°C and 29.92 inHg
   b. 59°C and 1013.2 millibars
   c. 59°F and 29.92 millibars

2. What effect does high density altitude have on performance?
   a. It increases engine performance
   b. It decreases climb performance
   c. It increases takeoff performance

3. A pilot and two passengers landed on a 2,100 foot east-west gravel strip with an elevation of 1,800 feet. The temperature is warmer than expected and after computing density altitude it is determined the takeoff distance over a 50 foot obstacle is 1,980 feet. The airplane is 75 pounds under gross weight. What would be the best choice?
   a. Takeoff to the west because the headwind will give the extra climb-out time needed
   b. Try a takeoff without passengers to make sure the climb is adequate
   c. Wait until the temperature decreases, and recalculate the takeoff performance

4. Determine the density altitude for these conditions: Altimeter setting 29.95 inHG, Runway temperature 81°F, Airport elevation 5250ft MSL.
   a. 4600 feet MSL
   b. 5877 feet MSL
   c. 7907 feet MSL

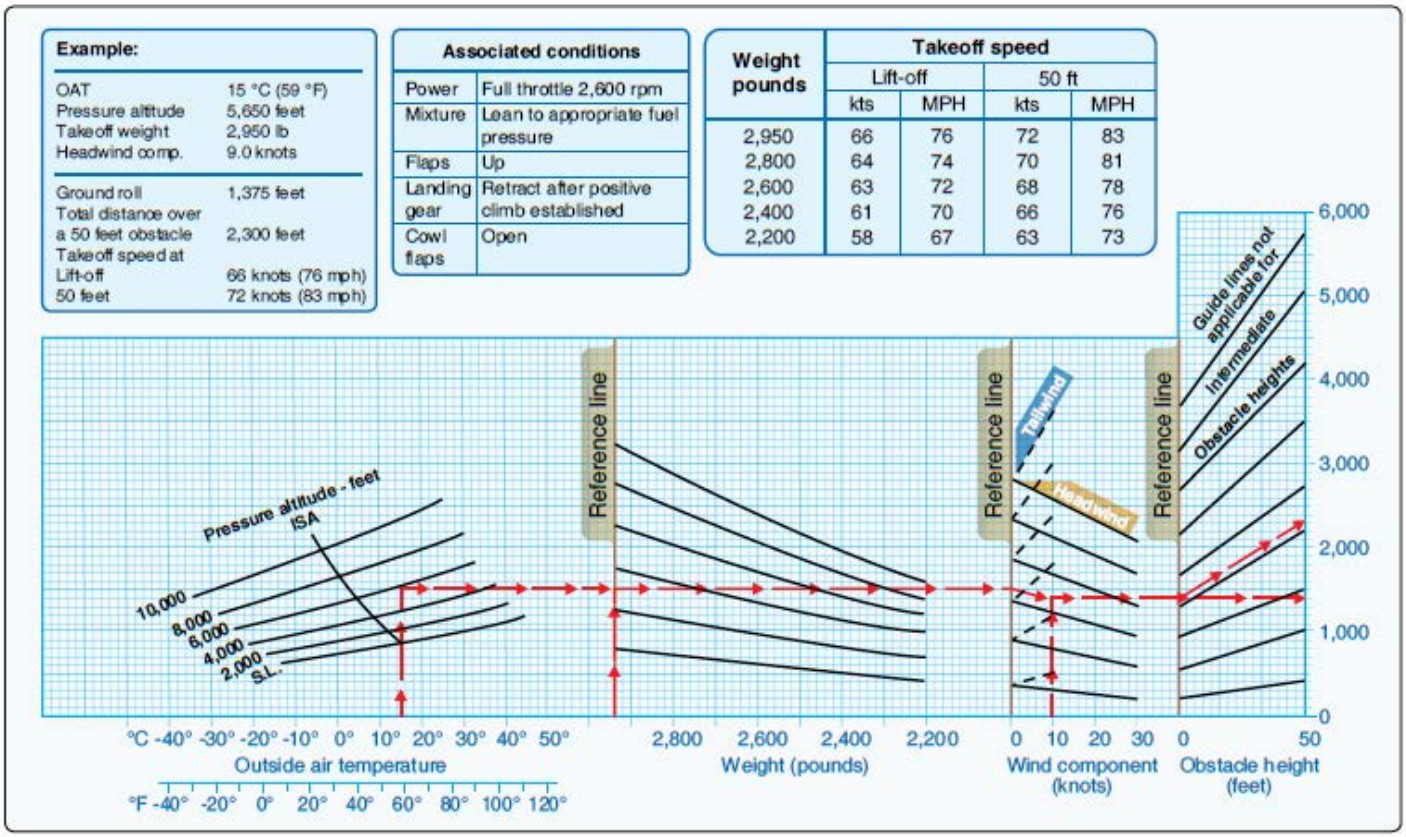


Figure 40. Airplane Takeoff Distance Graph.

5. Refer to Figure 40. Determine the ground roll distance required for takeoff: OAT 100°F, Press altitude 2000ft, Takeoff weight 2750 lbs, Headwind comp Calm
    a. 1150 feet
    b. 1300 feet
    c. 1800 feet

6. What is the headwind component for a landing on runway 18 if the tower reports the wind as 220° at 30 knots?
    a. 19 knots
    b. 23 knots
    c. 26 knots

7. What items are included in the empty weight of an aircraft?
    a. Unuseable fuel and undrainable oil
    b. Only the airframe, powerplant, and optional equipment
    c. Full fuel tanks and engine oil to capacity

8. An aircraft is loaded 110 pounds over maximum gross weight. If fuel is drained to bring the aircraft weight within limits, how much fuel should be drained?
    a. 15.7 gallons
    b. 16.2 gallons
    c. 18.4 gallons

9. Refer to fig 35 below. What is the expected fuel consumption for a 1,000 nautical mile flight under the following conditions?

    a. 60.2 gallons
    b. 70.1 gallons
    c. 73.2 gallons

    Pressure altitude ..... 8,000 ft
    Temperature..... 22°C
    Manifold pressure .....20.8 inHg
    Wind .....Calm

FIGURE 35.—Airplane Power Setting Table.

Cruise power settings
65% Maximum continuous power (or full throttle 2,800 pounds)

Press ALT.	ISA −20 °C (−36 °F)								Standard day (ISA)								ISA +20 °C (+36 °F)							
	IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS		IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS		IOAT		Engine speed	MAN. press	Fuel flow per engine		TAS	
Feet	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH
SL	27	−3	2,450	20.7	6.6	11.5	147	169	63	17	2,450	21.2	6.6	11.5	150	173	99	37	2,450	21.8	6.6	11.5	153	176
2,000	19	−7	2,450	20.4	6.6	11.5	149	171	55	13	2,450	21.0	6.6	11.5	153	176	91	33	2,450	21.5	6.6	11.5	156	180
4,000	12	−11	2,450	20.1	6.6	11.5	152	175	48	9	2,450	20.7	6.6	11.5	156	180	84	29	2,450	21.3	6.6	11.5	159	183
6,000	5	−15	2,450	19.8	6.6	11.5	155	178	41	5	2,450	20.4	6.6	11.5	158	182	79	26	2,450	21.0	6.6	11.5	161	185
8,000	−2	−19	2,450	19.5	6.6	11.5	157	181	36	2	2,450	20.2	6.6	11.5	161	185	72	22	2,450	20.8	6.6	11.5	164	189
10,000	−8	−22	2,450	19.2	6.6	11.5	160	184	28	−2	2,450	19.9	6.6	11.5	163	188	64	18	2,450	20.3	6.5	11.4	166	191
12,000	−15	−26	2,450	18.8	6.4	11.5	162	186	21	−6	2,450	18.8	6.1	10.9	163	188	57	14	2,450	18.8	5.9	10.6	163	188
14,000	−22	−30	2,450	17.4	5.8	10.5	159	183	14	−10	2,450	17.4	5.6	10.1	160	184	50	10	2,450	17.4	5.4	9.8	160	184
16,000	−29	−34	2,450	16.1	5.3	9.7	156	180	7	−14	2,450	16.1	5.1	9.4	156	180	43	6	2,450	16.1	4.9	9.1	155	178

Note: 1. Full throttle manifold pressure settings are approximate.
2. Shaded area represents operation with full throttle.

10. Refer to fig 38 below. Determine the total distance to land.

    a. 850 feet
    b. 1400 feet
    c. 1750 feet

OAT ..... 32°C
Pressure altitude ..... 8,000 ft
Weight 2600lbs
Headwind comp ..... 20 kts
Obstacle..... 50 ft

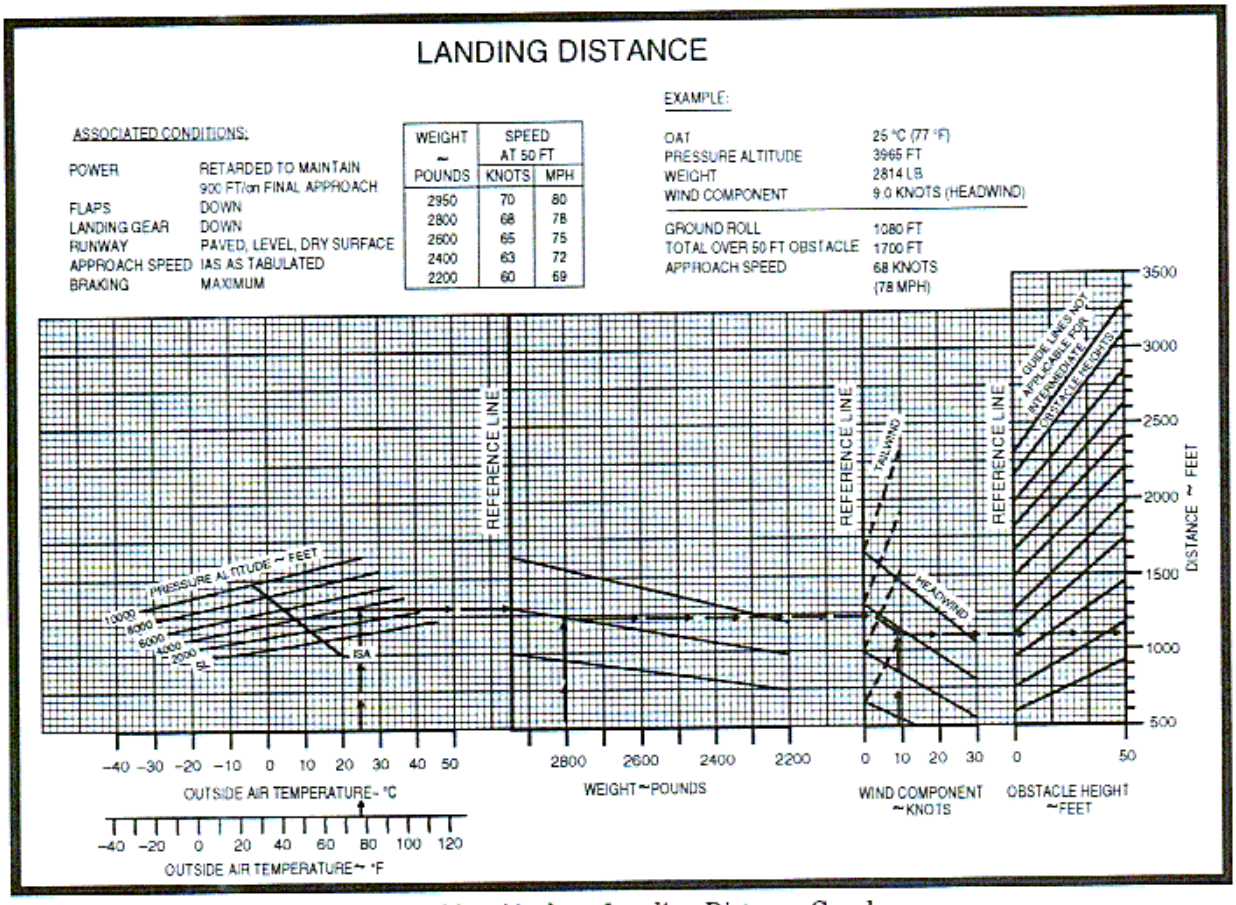


FIGURE 38.—Airplane Landing Distance Graph.

11. If an emergency situation requires a downwind landing, the pilot should expect a faster
    a. Airspeed at touchdown, a longer ground roll, and better control throughout the landing roll
    b. Groundspeed at touchdown, a longer ground roll, and the likelihood of overshooting the desired touchdown point
    c. Groundspeed at touchdown, a shorter ground roll, and the likelihood of undershooting the desired touchdown point

12. As a result of weight and balance, an aft loaded aircraft may
    a. Be more stable at all airspeeds, and in the event of a stall recovery will be easier
    b. Be less stable at all airspeeds, and in the event of a stall may have difficulty recovering
    c. Be more easily controlled at slow airspeeds, and in the event of a stall the aircraft will recover normally

13. Which statement best defines hypoxia?
    a. A state of oxygen deficiency in the body
    b. An abnormal increase in the volume of air breathed
    c. A condition of gas bubble formation around the joints or muscles

14. A pilot should be able to overcome the symptoms or avoid future occurrences of hyperventilation by
    a. Closely monitoring the flight instruments to control the airplane
    b. Slowing the breathing rate, breathing into a bag, or talking aloud
    c. Increasing the breathing rate in order to increase lung ventilation

15. Pilots are more subject to spatial disorientation if
    a. They ignore the sensations of muscles and inner ear
    b. Visual cues are taken away, as they are instrument meteorological conditions (IMC)
    c. Eyes are moved often in the process of cross-checking the flight instruments

16. What effect does haze have on the ability to see traffic or terrain features during flight?
    a. Haze causes the eyes to focus at infinity
    b. The eyes tend to overwork in haze and do not detect relative movement easily
    c. All traffic or terrain features appear to be farther away than their actual distance

17. Effects of carbon monoxide poisoning include
    a. Dizziness, blurred vision, and loss of muscle power
    b. Sweating increased breathing, and paleness
    c. Motion sickness, tightness across the forehead, and drowsiness

18. What is one of the neglected items when a pilot relies on short and long term memory fr repetitive tasks
    a. Checklists
    b. Situational awareness
    c. Flying outside the envelope

19. In the aeronautical decision making (ADM) process, what is the first step in neutralizing a hazardous attitude?
    a. Recognizing hazardous thoughts
    b. Recognizing the invulnerability of the situation
    c. Making a rational judgment

20. Every physical process of weather is accompanied by, or is the result of, a
    a. Movement of air
    b. Pressure differential
    c. Heat exchange

21. The wind at 5,000 AGL is southwesterly while the surface wind is southerly. This difference in direction is primarily due to
    a. Stronger pressure gradient at higher altitudes
    b. Friction between the wind and the surface
    c. Stronger Coriolis force at the surface

22. The boundary between two different air masses is referred to as a
    a. Frontolysis
    b. Frontogenesis
    c. Front

23. If there is a thunderstorm in the vicinity of an airport at which you will operate, which hazardous atmospheric phenomenon might be expected on the landing approach?
    a. Precipitation static
    b. Wind-shear turbulence
    c. Steady rain

24. What conditions are necessary for formation of a thunderstorm?
    a. High humidity, lifting force, and unstable air
    b. High humidity, high temperature, and cumulus clouds
    c. Lifting force, moist air, and extensive cloud cover

25. The conditions necessary for the formation of ice on an aircraft are
    a. A small temperature and dew point spread
    b. Freezing temperatures and a high dew point
    c. Freezing temperatures and visible moisture

26. Crests of mountain waves may be marked by stationary, lens shaped clouds known as
    a. Mammatocumulus clouds
    b. Standing lenticular clouds
    c. Roll clouds

27. Where does wind shear occur?
    a. At all altitudes, in all directions
    b. Only at higher altitudes
    c. Only at lower altitudes

28. Clouds, fog, or dew will always form when
    a. Water vapor condenses
    b. Water vapor is present
    c. Relative humidity reaches 100 percent

29. Which clouds have the greatest turbulence?
    a. Towering cumulus
    b. Cumulonimbus
    c. Nimbostratus

30. What are characteristics of unstable air?
    a. Turbulence and good surface visibility
    b. Turbulence and poor surface visibility
    c. Nimbostratus clouds and good surface visibility

31. When there is a temperature inversion you would expect to experience
    a. Clouds with extensive vertical development
    b. Good visibility in the lower levels of the atmosphere and poor visibility above an inversion aloft
    c. An increase in temperature as altitude increases

32. To get a complete weather briefing for the planned flight the pilot should request
    a. A standard briefing
    b. An abbreviated briefing
    c. A general briefing

33. For aviation purposes, ceiling is defined as the height above the earth's surface of the
    a. Lowest reported obscuration and the highest layer of clouds reported as overcast
    b. Lowest broken or overcast layer or vertical visibility into an obscuration
    c. Lowest layer of clouds reported as scattered, broken, or thin

34. Refer to the following METAR for KINK, what are the wind conditions?
    a. Calm
    b. 110° at 12 knots, gusts to 18 knots
    c. 111° at 2 knots, gusts 18 knots

METAR KINK 121845Z 11012G18KT 15SM SKC 25/17 A3000
METAR KBOI 121854Z 13004KT 30SM SCT150 17/6 A3015
METAR KLAX 121852Z 25004KT 6SM BR SCT007 SCT250 16/15 A2991
SPECI KMDW 121856Z 32005KT 1 1/2SM RA OVC007 17/16 A2980 RMK RAB35
SPECI KJFK 121853Z 18004KT 1/2SM FG R04/2200 OVC005 20/18 A3006

35. Refer to the METAR above. The remarks section for KMDW shows RAB35. This entry means
    a. Blowing mist has reduced the visibility to 1 1/12 SM
    b. Rain began at 1835Z
    c. The barometer has risen .35 in HG

36. To best determine general forecast weather conditions covering a flight information region, the pilot should refer to
    a. Aviation area forecasts
    b. Weather depiction charts
    c. Satellite maps

37. Refer to the TAF below. What is the forecast wind for KMEM from 1600Z until the end of the forecast?
    a. No significant wind
    b. Variable in direction at 6 knots
    c. Variable in direction at 4 knots

TAF

KMEM 121720Z 1218/1324 20012KT 5SM HZ BKN030 PROB40 2022 1SM TSRA OVC008CB
FM2200 33015G20KT P6SM BKN015 OVC025 PROB40 2202 3SM SHRA
FM0200 35012KT OVC008 PROB40 0205 2SM-RASN BECMG 0608 02008KT BKN012
BECMG 1310/1312 00000KT 3SM BR SKC TEMPO 1212/1214 1/2SM FG
FM131600 VRB06KT P6SM SKC=

KOKC 051130Z 0512/0618 14008KT 5SM BR BKN030 TEMPO 0513/0516 1 1/2SM BR
FM051600 18010KT P6SM SKC BECMG 0522/0524 20013G20KT 4SM SHRA OVC020
PROB40 0600/0606 2SM TSRA OVC008CB BECMG 0606/0608 21015KT P6SM SCT040=

38. Refer to the TAF above. In the forecast for KOKC, what should the forecast winds between the hours of 1600Z and 2200Z?
    a. 160° at 10 knots
    b. 180° at 10 knots
    c. 180° at 10 knots becoming 200° at 13 knots

39. A flag symbol on a sectional chart represents?
    a. A VFR reporting checkpoint
    b. A flight service station
    c. A weather balloon launching position

40. When a tower is denoted on a sectional
    a. The first number is the altitude at the top of the tower and the number in parenthesis is the height of the tower
    b. Blue towers are radio towers and red towers are lighted towers
    c. The tallest tower will always be denoted by the letters “UC”

41. Refer to the airport data block below. What is the identifier for the airport?
    a. WDG
    b. CT
    c. RP

ENID WOODRING RGNL (WDG)
CT – 118.9 * ©
AWOS-3 120.625
1167 *L 86 122.9
RP 31, 35

42. Refer to the airport data block above. When the tower closes, what frequency would be used to announced position and intentions to other traffic?
    a. 118.9
    b. 120.625
    c. 122.9

43. Refer to the airport data block above. What is the length of the runway at Enig regional Airport?
    a. 1167 ft
    b. 8600 ft
    c. 3500 ft with 3100 ft useable for landing

44. Refer to the airport data block above. What does the “RP 31, 35” mean?
    a. The longest runway is 3500 feet long, but only 3100 feet is available for use
    b. The traffic pattern for runways 31 and 35 is non-standard
    c. Regional procedures 31 and 35 are in use when approaching this airport

45. When approaching a radar controlled airport while on a cross country flight, the pilot should
    a. Establish radio communications when the aircraft is over a prominent checkpoint approximately 20 miles away
    b. Approach the airport cautiously and request a clearance at least 5 NM prior to entering controlled airspace
    c. Squawk 7500 prior to entering controlled airspace and then establish and maintain two way communications on the appropriate frequency

Coyote Flight Centers, LLC
Lesson grade sheet

Name: ___________________________
____

DOB: ____/____/________

				Pre-flight				Ground Ops				Takeoffs				Ground ref.			Upper air maneuvers					Basic Att. Instruction				Night Ops.		Cross country						Emer. Procs.				Pattern work			Landings					IFR							Commercial maneuvers						Misc.				
Date	Lesson	Ground	Flight	Weather briefing for flight	Certificates and documents	Visual inspection of aircraft	Passenger & crew briefing	Engine start-up	Taxiing	Engine operations/run-up	Signs and markings	Normal takeoff	Shortfield takeoff	Softfield takeoff	Crosswind takeoff	Turns around a point	Rectangular course	S-turns along a road	Four fundamental flight maneuvers	Slow flight including turns to a heading	Steep turns	Approach to landing stalls	Departure stalls	Four fundamental flight maneuvers	Compass turns	VOR Tracking	Recovery from unusual attitudes	Takeoffs and landings	Navigation	Flight planning	Pilotage	Dead reckoning	Radio navigation	Diversions	Lost procedures	POH boldface knowledge	Use of checklists	Emergency descents	Simulated engine outs	Flying a traffic pattern	Configuration and approach	Go-arounds	Normal landings	Shortfield landings	Softfield landigns	Crosswind landings	Forward slips to landing	ATC clearances	Holding	Arcs	SIDs and STARs	Approaches (non-Prec)	Approaches (Prec)	Missed approach	Steep turns	Chandelles	Lazy-8s	8s on pylons	Steep spirals	P/off accuracy landings	Use of checklists	Radio communications	Sterile cockpit procedures	Exam scores	Instructor Signature
	Total time:																																																																

N/A - Not applicable to current lesson, VD - Verbally discussed/demonstrated, NP - Needs practice, S - Satisfactorily demonstrates maneuver w/o assistance

Ground lessons - enter the date, lesson title, ground hours, and instructor signature

General	
Date:	/ /
Tail No:	
Time Off:	AM/PM

Engine	
Hobbs:	Start / End
Tach:	Start / End

Fold here

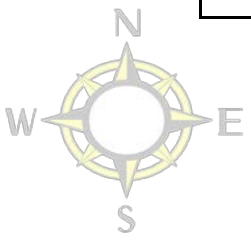
Instructions

1. Draw course on a sectional chart
2. Select waypoints along the course and record true course, distance, and altitude
3. Obtain a weather breifing to determine temperature, density altitude, and winds aloft
4. Use performance tables to establish power settings and true airspeed
5. Calculate wind correction angle and ground speed
6. Calculate compass heading, leg times, and fuel burn
7. Draw diagrams of any airport(s) and recorded winds

Waypoint	True Crse	Dist (NM)	Route Altitude	Comp Hdg	Leg Est. Time	Enroute Est. Time	Enroute Act. Time	Fuel	Temp (C°)	Density Altitude	Power settings MP/RPM	Power settings TAS	Power settings GPH	Winds Aloft Dir	Winds Aloft Vel	WCATH	Var^{MH}	Dev^{CH}	G Spd (Kts)
1	`																		
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
	Total:				Total:			Total:											

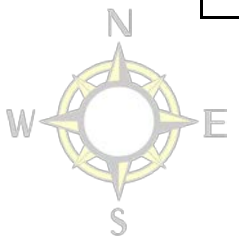
Airport: Elev:

Wind	Wx
	Appr
	Twr
	Gnd
	CTAF
	Clnc Dlv



Airport: Elev:

Wind	Wx
	Appr
	Twr
	Gnd
	CTAF
	Clnc Dlv



Enroute Graphical Weather Depiction

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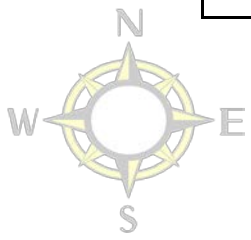
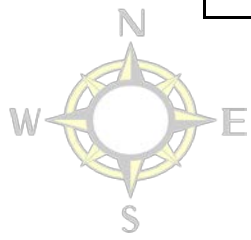
Airport: Elev:

Wind	Wx
	Appr
	Twr
	Gnd
	CTAF
	Clnc Dlv



Airport: Elev:

Wind	Wx
	Appr
	Twr
	Gnd
	CTAF
	Clnc Dlv



Weight and Balance

Item/Station	Weight	Arm	Moment
Total:	Total Weight	C.G.	Total Moment

C.G. = Total Moment / Total Weight

Risk Evaluation

		High risk				Low risk		
Pilot	Illness/Medications	Sick or on medication(s)			Perfect health			Illness/Medications
	Stressfull events	Stressfull event sometime in the last few days			No stressfull events noted			Stressfull events
	Alcohol	Within last 8 hours or BAC > .04%		Within 8-24 hours and BAC < .04%		None in the last 24 hours		Alcohol
	Fatigue (Hours since last rest/sleep)	more than 12	10 - 12	8 - 10	6 - 8	4 - 6	less than 4	Fatigue (Hours since last rest/sleep)
	Hours since last healthy meal	more than 4		2 - 4		less than 2		Hours since last healthy meal
Aircraft	Weight and balance	Out of limits		Near edge of limits		Well within limits		Weight and balance
	Performance data	Above limits or off the chart		Near the limits or top of the chart		Well within limits		Performance data
	Familiarity with A/C	Never flown aircraft before		< 5 flights within the pre 30 days		> 5 flights in pre 30 days		Familiarity with A/C
Environment	Ceilings (AGL)	1000 or less		1000 - 3000		3000 or greater		Ceilings (AGL)
	Visibility (statute miles)	less than 10		10 - 20		greater than 20		Visibility (statute miles)
	Significant WX	Thunderstorms		Icing		IFR conditions (need IFR cert)		Significant WX
	Terrain	Mountainous		Hilly		Flat		Terrain
Ext. Press.	Allowance for delays in arrival	less than 30 mins		30 - 60 mi ns		more than 60 mins		Allowance for delays in arrival
	Allowance for delays in departure	None		Able to stay overnight		Able to stay multiple nights		Allowance for delays in departure

This risk evaluation matrix is NOT conclusive and cannot replace the use of good personal judgement. ***Red indicates EXTREMELY HIGH risk/no fly scenarios.***

Certificate of Enrollment

Part 141 - Private Pilot Ground School Course

This is to acknowledge that

_____

Student name

Has enrolled in the Private Pilot Ground School training program.

conducted by

Coyote Flight and Training Centers 5YTS307L

_____ _____

Chief Flight Instructor *Date*

"Sapientia et Libartatem"

Rick Husband Amarillo International Airport 11001 Baker Street Amarillo, Texas 79111
Office (806)335-9763 Fax (806)335-9221

Graduation Certificate

Part 141 Private Pilot Ground School Course
This is to certify that

_____

Student name

Has satisfactorily completed each required stage of the approved course of training, including tests for those stages.

He/she has graduated from the Federal Aviation Administration approved Private Pilot Ground School course, conducted by

Coyote Flight and Training Centers 5YTS307L

_____ _____

Chief Flight Instructor *Date*

"Sapientia et Libertatum"

PPG 01 of 14 - Introduction to Flight Training

Objective	Prepare the student for flight training. Establish the definition of airworthiness and safety.			
Prerequisites	• None			
Approx. Time	**Ground:**	2.0	**Flight:**	N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge (PHAK) ☐ Computer with Internet ☐ Airplane ☐ Pilot's Logbook ☐ Student's driver's license and birth certificate			
Aeronautical knowledge	☐ Pre-flight decision making o VFR vs IFR o METARs/TAFs o Limitations ▪ Having limitations simplifies the decision making process ▪ Company weather limitations ▪ Setting personal limitations o Personal well-being ▪ Personal well-being is important to the safe outcome of the flight ▪ IM SAFE (Illness, medication, stress, alcohol, food, exhaustion) ☐ Pre-flight inspection (Airworthiness and safety) o An aircraft is considered airworthy if it is both safe to fly and is in compliance with FAA regulations o Checklists are intended to reduce mistakes by creating a list of items that need to be accomplished in order to ensure the aircraft and its operations are conducted in a safe manner. o All aircraft are required to have the following items on board in order to be airworthy (ARROW): ▪ Airworthiness certificate (Original as issued from the FAA) ▪ Registration certificate (Must be original, and must not have expired) ▪ Radio operators license (N/A within the United States) ▪ Operating limitations (Includes Operating Handbook, Flight Manual Supplements, placards, etc.) ▪ Weight and balance (of the aircraft as done by the mechanic) o Some things to look for when inspecting the airframe: ▪ Cracks around rivets, along hinges, or in the skin of the aircraft ▪ Loose rivets, bolts, or screws ▪ Wrinkles in the skin of the aircraft (aka oil canning) ▪ Leaking fluids such as avgas, hydraulic fluid, or oil ▪ Low or poorly inflated tires or oleo struts ▪ Nicks in the propeller ▪ Anything that would affect the structural integrity of the airframe			
Tasks	☐ Administrative o Verify student's citizenship for TSA (copies of driver's license and birth certificate) o Create an account with iacra.faa.gov and apply for student pilot's certificate o Create an account with medxpress.faa.gov, apply for 3rd class medical, and set-up medical appointment			

	○ Create an account with www.faasafety.gov ○ Create an account in www.aeroledger.com for dispatch ○ Dispatch the aircraft out and check for squawks ☐ Review aeronautical knowledge ☐ Pre-flight ○ Check personal well-being with IM SAFE ○ Check local weather and learn to read a METAR and TAF ○ Discuss the difference between VFR and IFR ○ Discuss the anatomy of an airplane (Nose, fuselage, wings, empennage, and control surfaces/controls) ○ Student is introduced to the concept of a checklist and conducts a pre-flight inspection under the direction of the instructor
Notes	No flight is required for this lesson.
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Student must also demonstrate a basic understanding of the concept of airworthiness, safety, parts of an aircraft. Student must understand the difference between VFR and IFR flight.

PPG 02 of 14 - Airports, operational safety, and decision making

Objective	Introduce the student to decision making procedures in the aviation environment.			
Pre-requisites	• N/A			
Approx. Time	**Ground:**	2.0	**Flight:**	N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25B (PHAK) ☐ Video: Runway Incursion at Francis Green			
Aeronautical knowledge	☐ Federal Aviation Regulation 91.3 – The pilot in command is the ultimate authority and the sole responsibility for the safe outcome of the flight. In the event of an emergency the pilot in command may deviate from any rule in this part to the extent necessary to ensure the safe outcome of the flight. ☐ Airport operations ..... PHAK 14-1 o Airport types ..... PHAK 14-2 ▪ Towered ▪ Un-towered o Sources for airport information ..... PHAK 14-3 ▪ Aeronautical charts ▪ Chart supplement U.S. (AFD) ▪ Notices to airmen (NOTAMs) ▪ Automated terminal information systems o Runway markings and signs .....PHAK 14-5 thru 14-11 ▪ Runway designation markings ▪ Runway safety area ▪ Runway holding position sign ▪ Runway holding position marking ▪ Runway distance remaining signs ▪ Relocated runway threshold ▪ Displaced threshold ▪ Land and hold short operations (LAHSO) o Taxiway markings and signs ..... PHAK 14-11 thru 14-16 ▪ Direction signs (A yellow array points the way) ▪ Location signs (A black square you're there) ▪ Holding position signs and markings ▪ Non-movement line ▪ Enhanced taxiway centerline ▪ ILS critical areas ▪ Closed runways and taxiways (temporarily/permanently) o Airport lighting ..... PHAK 14-16 ▪ Airport beacon ▪ Taxiway lights ▪ Runway lights ▪ Visual glideslope indicators ▪ Obstruction lights ▪ Runway guard lights ▪ Stop bar lights ▪ Runway end identifier lights (REIL)			

- Control of airport lighting ..... PHAK 14-18
- Wind direction indicators ..... PHAK 14-20
- Wake turbulence ..... PHAK 14-26
  - Generation
  - Behavior
  - Avoidance
- Collision avoidance
  - Clearing procedures
  - Pilot deviations (PDs)
  - Runway incursion
  - Runway confusion

- Aeronautical Decision Making..... PHAK 2-1
  - Introduction ..... PHAK 2-1
  - History of ADM..... PHAK 2-2
  - Risk management ..... PHAK 2-3
  - Crew resource management and Single pilot resource management . PHAK 2-4
  - Hazard and risk ..... PHAK 2-4
    - Hazardous attitudes and antidotes ..... PHAK 2-5
    - Risk ..... PHAK 2-6
      - Assessing risk
        - Likelihood of an event
          - Probable – an event will occur several times
          - Occasional – an event will probably occur some time
          - Remote – an event is unlikely to occur but is possible
          - Improbable – an event is highly unlikely to occur
        - Severity of an event
          - Catastrophic – results in fatalities, total loss
          - Critical – severe injury, major damage
          - Marginal – minor injury, minor damage
          - Negligible – less than minor injury or damage
      - Mitigating risk
        - Wait for the weather to improve
        - Take an instrument rated pilot
        - Delay or cancel the flight
        - Drive
    - The Big APE (Used in lieu of PAVE)
      - A = Aircraft
        - Can it complete the flight within its performance limitations?
        - How is it equipped?
        - Is it properly maintained and airworthy?
        - Am I proficient with the aircraft and its systems?
      - P = Pilot
        - IM SAFE (Illness, medication, stress, alcohol, food, exhaustion)
        - Hazardous attitudes
          - Antiauthority
          - Macho
          - Impulsivity
          - Invulnerability
          - Resignation

- External pressures
    - Why am I going?
    - Am I prepared to spend the night in case of delays?
    - Get 'er duns, Get-home-itis, etc.
    - Did I bring grandma's medications?
- E = Environment
  - Hazardous weather (Will it be safe during the flight and remain safe long enough for a return trip home?
  - Terrain
  - Survival in the event of a forced landing (Is a forced landing even possible?)

- The PAVE checklist ..... PHAK 2-8
  - P = pilot
    - IM SAFE
    - Hazardous attitudes
  - A = aircraft
    - Can the aircraft perform the mission?
    - Can I proficiently operate the aircraft and all of its onboard equipment?
    - Is the aircraft legal and airworthy?
  - V = enVironment
    - Is the weather along and around the route of flight safe? And will it remain safe for my return trip?
    - What am I flying over? Am I prepared to survive in the case of an unscheduled landing?
  - E = external pressures
- Human factors ..... PHAK 2-10
  - Human behavior ..... PHAK 2-11
- Decision making processes ..... PHAK 2-12
  - Single pilot resource management ..... PHAK 2-13
  - The 5 P's ..... PHAK 2-14
    - Plan
    - Plane
    - Pilot
    - Passengers
    - Programming
  - 3P Model ..... PHAK 2-15
  - CARE Checklist ..... PHAK 2-16
  - DECIDE Model ..... PHAK 2-18
- Decision making in a dynamic environment ..... PHAK 2-21
  - Automatic decision making ..... PHAK 2-21
  - Operational pitfalls ..... PHAK 2-21
- Stress management ..... PHAK 2-21
- Use of resources ..... PHAK 2-21
- Situational awareness ..... PHAK 2-24
  - Obstacles to maintaining situational awareness
  - Workload management
  - Managing risks
- Automation ..... PHAK 2-25

	• Results of the study ..... PHAK 2-27
	• Equipment use ..... PHAK 2-27
	  o Autopilot systems
	  o Familiarity
	  o Respect for onboard systems
	  o Getting beyond rote workmanship
	  o Understanding the platform
	• Managing aircraft automation ..... PHAK 2-29
	• Enhanced situational awareness ..... PHAK 2-30
	• Risk management ..... PHAK 2-31

Tasks	☐ Review the aeronautical knowledge ☐ Watch and discuss Video: Runway incursion at Francis Green
Notes	• Student should be able to differentiate between the areas of an airport (apron/ramp, taxiways, and runways) and be able to find their assigned radio frequencies. • Student should understand that there many decision making process models, and he/she needs to incorporate the one that is most useful for their type of flying. • Student should understand that LAHSO operations are NOT permitted for students nor are they mandatory for certificated pilots. • Emphasis should be put on using either the PAVE or the APE model prior to each flight
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. The student should memorize the IMSAFE, PAVE, and APE checklists. The student should be able to identify the basic markings at an airport.

PPG 3 of 14 - Aerodynamics, stability, and turning tendencies

Objective	To help the student understand the forces that act upon an aircraft in-flight so that he/she may better control them.
Pre-requisites	• None
Approx. Time	**Ground:** 4.0 **Flight:** N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25B (PHAK) ☐ Model aircraft
Aeronautical knowledge	☐ The four forces acting on an aircraft ..... PHAK 5-1 o Weight ..... PHAK 5-1 o Lift ..... PHAK 5-3 ▪ Theories in the production of lift ..... PHAK 4-5 • Newton's law (creating lift thru angle of attack) • Bernoulli's law (creating lift thru camber) ▪ Airfoil design ..... PHAK 4-6 • Airfoil cross section ..... PHAK 4-7 fig. 4-5 o Chord line o Camber o Leading edge o Trailing edge • Pressure distribution ..... PHAK 4-7 o Low pressure above (Bernoulli's law) o High pressure below (Newton's law) o Thrust ..... PHAK 5-2 o Drag ..... PHAK 5-6 ▪ Parasite drag ▪ Induced drag ▪ Lift/drag ratio (L/D_{Max}) ☐ Wingtip Vortices ..... PHAK 5-8 o Formation o Avoiding wake turbulence ☐ Ground effect ..... PHAK 5-11 ☐ Axes of an aircraft ..... PHAK 5-12 o Roll about the longitudinal o Pitch about the lateral o Yaw about the vertical ☐ Aircraft design characteristics ..... PHAK 5-14 o Stability ..... PHAK 5-14 ▪ Static vs. Dynamic ▪ Longitudinal ▪ Lateral • Dihedral • Sweepback and wing location • Keel effect and weight distribution ▪ Directional ▪ Free directional oscillations (Dutch roll) ▪ Spiral o Effect of wing planform ..... PHAK 5-20

- Aspect ratio
- Wing designs

- Aerodynamic forces in flight maneuvers ..... PHAK 5-22
  - Forces in turns ..... PHAK 5-22
    - Components of lift
    - Adverse yaw
    - Overbanking tendency
  - Forces in climbs ..... PHAK 5-23
    - Climb entry
    - Thrust vs. drag in a climb
  - Forces in descents ..... PHAK 5-24
- Stalls and spins ..... PHAK 5-25
- Angle of attack indicators ..... PHAK 5-26
- Basic propeller principles (Left hand turning tendencies) ..... PHAK 5-28
  - Torque
  - Corkscrew effect (spiraling slipstream)
  - Gyroscopic action
  - Asymmetric loading (P-factor)
- Load factors ..... PHAK 5-33
  - In aircraft design
  - In steep turns
  - Effect on stalling speed
  - Flight maneuvers
  - Rough air and maneuvering speed (V_A)
  - V_g diagram
  - Rate of turn
- Flight controls ..... PHAK 6-1
  - Flight control systems ..... PHAK 6-2
    - Primary flight controls
      - Ailerons ..... PHAK 6-3
        - Purpose
        - Adverse yaw
        - Differential ailerons
        - Frise type ailerons
        - Coupled ailerons and rudder
        - Flaperons
      - Elevator ..... PHAK 6-5
        - Purpose
        - T-tail
        - Stabilator
        - Canard
      - Rudder ..... PHAK 6-8
        - Purpose
        - V-tail (rudder-vator)
    - Secondary flight controls
      - Flaps and types of flaps ..... PHAK 6-8, PHAK 3-6
      - Leading edge devices (slots) ..... PHAK 6-9
      - Spoilers ..... PHAK 6-10
      - Trim systems ..... PHAK 6-10

	o Trim tabs o Balance tabs o Servo tabs o Anti-servo tabs o Ground adjustable tabs o Autopilots
Tasks	Review aeronautical knowledge
Notes	• N/A
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Instructor should verify students understanding of this topic by verbally questioning the student.

PPG 4 of 14 - Aircraft systems

Objective	Give the student the knowledge necessary to understand the systems he/she will be operating, and assist with diagnosing and troubleshooting unforeseen, in-air emergencies.
Pre-requisites	• N/A
Approx. Time	**Ground:** 4.0 **Flight:** N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B) (PHAK)
Aeronautical knowledge	Aircraft construction ☐ Design certification and airworthiness ..... PHAK 3-1 ☐ Major components ..... PHAK 3-2 o Fuselage o Wings o Empennage o Landing gear o Powerplant ☐ Subcomponents ..... PHAK 3-8 o Airframe o Electrical system o Flight controls o Etc. ☐ Types of aircraft construction ..... PHAK 3-8 o Truss structure o Monocoque and semimonocoque (metal) o Composite construction ▪ Advantages and disadvantages ▪ Fluid spills ▪ Lightning strike protection ☐ Aircraft Systems ☐ Powerplant o Reciprocating engines ..... PHAK 7-1 o Propeller ..... PHAK 7-4 ▪ Fixed pitch ▪ Adjustable pitch ▪ Propeller overspeed o Induction systems ..... PHAK 7-7 o Carburetor systems ..... PHAK 7-8 ▪ Mixture control ▪ Carburetor icing ▪ Carburetor heat ▪ Carburetor air temperature gauge o Outside air temperature gauge ..... PHAK 7-11 o Fuel injection system ..... PHAK 7-11 ☐ Super chargers and turbochargers ..... PHAK 7-12 o System operation o High altitude performance ☐ Ignition system ..... PHAK 7-15 ☐ Oil system ..... PHAK 7-16 ☐ Engine cooling systems ..... PHAK 7-17

- ☐ Exhaust system ..... PHAK 7-18
- ☐ Starting system ..... PHAK 7-18
- ☐ Combustion ..... PHAK 7-18
- ☐ Full authority digital engine control (FADEC) ..... PHAK 7-20
- ☐ Turbine engines ..... PHAK 7-20
  - o Types of turbine engines ..... PHAK 7-20
  - o Turbine engine instruments ..... PHAK 7-22
  - o Turbine engine operational considerations ..... PHAK 7-23
  - o Performance comparison of turbine engines ..... PHAK 7-24
- ☐ Airframe systems ..... PHAK 7-25
- ☐ Fuel systems ..... PHAK 7-25
  - o Gravity feed system
  - o Fuel pump system (engine driven/electric boost pump)
  - o Fuel primer
  - o Fuel tanks
  - o Fuel gauges
  - o Fuel selectors
  - o Fuel strainers, sumps, and drains
  - o Fuel grades
  - o Fuel contamination
  - o Fuel system icing
- ☐ Refueling procedures ..... PHAK 7-29
- ☐ Heating system ..... PHAK 7-29
  - o Fuel fired heaters
  - o Exhaust heating systems
  - o Combustion heater systems
  - o Bleed air heating systems
- ☐ Electrical system ..... PHAK 7-30
- ☐ Hydraulic systems ..... PHAK 7-31
  - o Landing gear
    - ▪ Tricycle vs. tailwheel
    - ▪ Fixed vs. retractable
  - o Brakes
- ☐ Pressurized aircraft ..... PHAK 7-34
- ☐ Oxygen systems ..... PHAK 7-37
  - o Oxygen masks
  - o Cannulas
  - o Pressure demand systems
  - o Continuous flow systems
  - o Electrical pulse demand systems
  - o Pulse oximeters
  - o Servicing of oxygen systems
- ☐ Anti-ice and de-ice systems ..... PHAK 7-40
  - o Airfoil anti-ice and de-ice
  - o Wind screen anti-ice
  - o Propeller anti-ice
  - o Other anti-ice

Tasks	Review the aeronautical knowledge
Notes	• Student should be aware that the ignition system and the electrical system of most aircraft are two separate systems and that the engine will continue to run in the event of an alternator failure.
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Instructor should verify students understanding of this topic by verbally questioning the student.

PPG 5 of 14 - Airspace

Objective	Introduce the student to the National Airspace System and the rules that govern it so that he/she may operate within it safely.
Pre-requisites	• N/A
Approx. Time	**Ground:** 2.0 **Flight:** N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25B (PHAK)
Aeronautical knowledge	☐ The purpose of controlled airspace is to allow ATC to maintain varying levels of positive control over IFR traffic. In uncontrolled airspace, ATC cannot guarantee positive control of any kind, and thus an IFR clearance cannot be obtained. ☐ Six major airspaces ..... PHAK 15-1 o Class A o Class B o Class C o Class D o Class E o Class G ☐ Special use airspace ..... PHAK 15-3 o Prohibited o Restricted o Military operation areas (MOAs) o Alert areas o Controlled firing areas ☐ Other airspace ..... PHAK 15-4 o Local airport advisory (LAA) o Military training routes (MTR) o Temporary flight restrictions (TFRs) o Published VFR routes o Terminal RADAR service areas (TRSAs) o National Security Areas (NSAs) ☐ Air traffic control and the national airspace system ..... PHAK 15-7 o Coordinating the use of the airspace system o Operating rules and pilot/equipment requirements o Operating under special VFR
Tasks	☐ Review the aeronautical knowledge
Notes	• The easiest method by which to teach airspace is to break the six major airspaces into two categories by size: o A, E, and G are the largest, exist across the U.S., and are where the pilots will spend most of their time. They should be viewed as layers looking from the "top down", and are not depicted on the sectional. o E is depicted on the chart only when it extends below 1200 ft AGL. o D, C, and B are local airspaces surrounding controlled airports. They should be viewed as "sprouting out of the ground" and growing upwards. • Each airspace explanation should be accompanied by its basic VFR weather minimums, its depiction on a sectional, and requirements for entry and operation within.

	• It should be stressed that conditions with less than 1000’ ceilings and 3SM visibility are considered Instrument Meteorological Conditions.
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Student should be able to identify airspace and associated altitudes on a VFR sectional.

PPG 6 of 14 - Aeronautical charts and supplements

Objective	Teach the student how to find information on a sectional chart and its supplements in order to effectively prepare flight plan.
Pre-requisites	• PPG 5 of 14 – Airspace (Coyote Document 16)
Approx. Time	**Ground:** 2.0 **Flight:** N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B) (PHAK) ☐ VFR sectional ☐ Chart supplement data
Aeronautical knowledge	☐ Pilotage is the ability to recognize items on a map, relate them to locations on the ground, and then navigate from location to location visually. ☐ Aeronautical charts o Sectional charts o VFR terminal charts o World aeronautical charts ☐ Latitude and longitude (meridians and parallels) ☐ Isogonic lines (variation) ☐ Topographical information (color coded) ☐ Quadrangles o Spot elevations o Maximum elevation figure ☐ Landmarks o Cities o Rivers and ponds o Dams o Highways o VFR checkpoints o Towers o Windmills o Bridges ☐ Airports o Cyan vs Magenta o Open circle vs filled circle vs blocky style o Private vs public airports o Airports with facilities such as fuel o How to read airport information tag o Acquiring airport information from the chart supplements ☐ Radio beacons o VOR's o NDB's o Remote communications outlets ☐ Airways o Victor airways o Millitary training routes ▪ VR vs IR ▪ Above 1500 ft AGL vs below 1500ft AGL ☐ Airspace o Class E

	o Class D o Class C o Class B
Tasks	Review the aeronautical knowledge
Notes	N/A
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Student should be able to identify airspace, obstacles, airports and find airport information.

PPG 7 of 14 - Federal regulations, inspections, and documents

Objective	Teach the student the written set of regulations provided by the FAA to ensure safe operations within the national airspace system.			
Pre-requisites	• N/A			
Approx. Time	**Ground:**	4.0	**Flight:**	N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge ☐ The NTSB's Role in Aviation Safety by Robert L Sumwalt and Sean L Dalton of the National Transportation Safety Board			

Aeronautical knowledge

- ☐ The FAA is an independent federal agency charged, by congress, to oversee and regulate aviation operations within the United States of America, as well as the operation and development of the national airspace system.
- ☐ FAR numbering system
- ☐ Rule of rules – Just follow it
- ☐ Terms
  - CFR (Code of Federal Regulations)
  - Aircraft
  - Category – something flyable with similar operating characteristics.
    - Airplane
    - Glider
    - Rotorcraft
    - Lighter than air
    - Powered lift
    - *Powered parachute*
    - *Weight shift control*
    - *UAV*
  - Class – a subdivision of categories, where each category has similar propulsion, flight, or landing characteristics.
    - ie. Airplane, single-engine land.
  - Make & model
  - Pilot certificates determine privilege type
- ☐ Student pilots
  - Must apply for a student pilot certificate
  - 61.87 – Solo requirements for student pilots
    - Received all basic training specified in 61.87
    - Pass a pre-solo written exam
    - Must have a medical
    - Logbook endorsement
      - Specific to make and model
      - Has an expiration date (usually 90 days)
      - Separate endorsement for night
      - May not land at other airports without endorsements
      - Instructor may add additional limitations

Examples:

- *Notification of instructor 24hrs. before flight*
- *Crosswind component limited to 7kts*
- *Maximum gust factor may not exceed 15 kts.*
- *Full fuel tanks before every flight.*
- *No solo if student expects to have any fun.*

  - 61.89 – General limitations for solo students
    - Student pilot
      - May not carry passengers

- May not fly for hire or for any business pursuit
- May not fly without visual reference to the surface or when day visibility is less than 3 miles, or night visibility is 5 miles.
- Must adhere to requirements of endorsement
- Must remain within 25 NM of the airport of departure

▪ 61.93 – Solo cross country flight requirements
- Main objective is to keep you from getting lost
- X-country
  - o defined as a flight with a landing at an airport other than the point of departure
  - o for certification purposes must be 50NM or greater.
- May have a one-time endorsement for repeated training between 25NM-50NM

☐ Private pilots
- o 61.103 – Private pilot requirements
  - ▪ Minimum age requirements
  - ▪ Be able to understand, read, write, and speak English
  - ▪ Pass a knowledge exam within the preceding two years
  - ▪ Pass a practical examination
- o 61.109 – Training requirements
  - ▪ Must have the aeronautical knowledge specified in 61.105
  - ▪ Must have the flight experience specified in 61.107 (40hrs total)
    - 20hrs dual
      - o 3 hrs x-country
      - o 3 hrs night
        - ▪ 10 takeoffs and landings
        - ▪ 1 night X-country flight of over 100 NM total distance
      - o 3 hrs instrument
    - 10hrs solo
      - o 3 takeoffs and landings to a full stop at an operating control tower.
      - o 5 hrs x-country
        - ▪ 50NM rule
        - ▪ 1 flight at least 150NM total length with three full stop landings and one leg must be at least 50NM.
- o 61.113 – Privileges and limitations
  - ▪ May fly without supervision and carry passengers and/or cargo
  - ▪ May NOT carry passengers or property for hire
  - ▪ May share the direct operating expenses of the flight
  - ▪ May fly in support of a charitable organization seeking donations (500 hours min total time)
  - ▪ May be compensated if the flight is incidental to their work

☐ Instrument pilots
- o 61.65 – Flight experience
  - ▪ 50 hours of cross country flight as PiC
  - ▪ 15 hours of training with an authorized instructor
  - ▪ 40 hours of actual or simulated instrument
- o Privileges and limitations
  - ▪ May operate under Instrument Flight Rules
  - ▪ Note: NOT for flying through thunderstorms, icing, or other dangerous weather

☐ Commercial pilots
- o 61.129 – Flight experience
  - ▪ 100 hours in powered aircraft, with min 50 hours in airplanes
  - ▪ 100 hours of PiC time, with

- min 50 in airplanes
- 50 hours of cross country, min 10 in airplanes
- 10 hours of instrument training
- 10 hours of complex training
- One 2 hour cross country during the day more than 100 NM away
- One 2 hour cross country during the night more than 100 NM away
- 10 hours of solo flight time
- 5 hours at night with at least 10 takeoffs and landings at an airport with an operating control tower
- One cross country flight of at least 300 NM total distance, with three landings, one of which must be at least 250 NM away.

o 61.133 – Privileges and limitations
- May carry persons or property for compensation or hire
- May not hold out
- May not provide both a plane and pilot (no charters)
- Must have an instrument rating or:
  - Limited to 50NM
  - Daytime flight only

☐ Additional endorsements and privileges
- o Type rating
  - Weight > 12,500lbs
  - Turbine powered
- o VFR (Visual Flight Rules)
- o IFR (Instrument Flight Rules)
- o Night - period of time between the end evening civil twilight and beginning of morning civil twilight as published in the American Air Almanac converted to local time.
- o PIC (Pilot-in-command)

☐ Part 61 - Certification of flying, administrative regulations
- o 61.3 - Requirement for certificates or ratings
  - Must have certificates available
  - Must have current medical available
  - Must ***present*** certificates upon request of any FAA official or law-enforcement person.
- o 61.15 - Alcohol or drugs
  - Suspension, revocation, or denial of a certificate
  - Minimum waiting periods (up to 1 yr.)
  - Motor vehicle actions involving drugs/alcohol must be reported within 60 days.
  - Bottle to throttle rule – must wait 8 hours between drinking and flying.
  - Legal limit of 0.04% BAC (Blood alcohol content)
  - Cold medicine, Nyquil
- o 61.23 – Duration of medical certificates
  - Student certificate doubles as pilot certificate
  - 1st Class
    - 6 calendar months
  - 2nd Class
    - 12 calendar months
  - 3rd Class
    - 60 calendar months under 40
    - 24 calendar months 40 or over
  - Waivers
- o 61.31 – Additional training requirements
  - High performance
  - Complex
    - Retractable landing gear
    - Flaps

- Controllable pitch propeller
- Tail wheel
- Pressurized above 25,000MSL (separate endorsements)

- 61.56 – Flight reviews
  - 24 Calendar month duration (exercise of privileges)
  - 1 hour ground and 1 hour flight time
  - No provisions for failure, educational experience
  - Substitutes
    - New certificates
    - Completing phases of FAA programs ie. Wings.
- 61.57 – Recent flight experience PIC (Recency Rule)
  - For carrying passengers, at least three takeoffs and landings within the preceding 90 days in the same category, class, and type (if required)
  - Tail wheel airplanes must be to a full stop
  - Night time must be to a full stop and between 1 hour after sunset and 1 hour before sunrise.
  - Night and tail wheel currency automatically covers daytime currency, but not vice versa
- 61.60 – Change of address

- Part 91 – General operating and flight rules
  - 91.3 – Responsibility and authority of the PIC
    - Sole and final authority over the flight
    - Declaring an emergency
  - 91.7 – Civil aircraft airworthiness
    - PIC is responsible for determining airworthiness
    - No aircraft may be operated unless airworthy
  - 91.9 – Civil aircraft flight manual, markings, and placards
  - 91.15 – Dropping objects
  - 91.17 – Alcohol or drugs
    - Must submit to sobriety or drug tests upon request
    - May not carry a passenger who appears intoxicated or is under the effects of drugs or alcohol
  - 91.103 – Pre-flight action
    - WK FART
    - Pre-flight inspection
  - 91.105 – Flight crewmembers
    - Must be in their seats during operation of the aircraft
    - Seatbelts must be worn at all times
    - Shoulder harnesses must be worn if the aircraft is equipped and they do not interfere with operation of the aircraft.
    - Flight crewmembers may leave their seats when this action is necessary to the operation of the aircraft or when they are attending to physiological needs.
  - 91.107 – Use of safety belts
    - Passengers must be briefed on use of seatbelts prior to take-off.
    - Seatbelts and shoulder harnesses must be used by all passengers during taxi, take-off, and landing.
    - Exceptions
      - Children under two years old
      - Parachutists
  - 91.111 – Operating near other aircraft
    - No buzzing
    - Formation flying without permission
    - Formation flying for hire
  - 91.113 – Right-of-way rules
    - See and avoid
    - Scenarios

- Converging aircraft at same altitude
- Aircraft approaching head on
- Aircraft overtaking another
- Aircraft landing

- Right-of-way priority
  - Aircraft in distress
  - Balloon
  - Glider
  - Aircraft towing another
  - Airship
  - Airplane
  - Unmanned aerial vehicles
- Don't demand right of way

- 91.115 – Right-of-way rules (water operations)
  - Same as right-of-way in the air except for overtaking vessels in which case the overtaking vessel may alter course as needed instead of only to the right.
- 91.117 – Aircraft speed limits
  - 250 kts below 10,000 MSL
  - 200 kts at or below 2,500 AGL within 4NM of primary airport
  - 250 kts within Class B airspace, 200 kts below it
- 91.119 – Minimum safe altitudes
  - Must be able to make a no-engine landing without creating a hazard to persons or property on the surface
  - In a congested area must be 1000ft above the highest obstacle within 2000ft
  - In an uncongested area
    - May not be operated lower than 500ft unless over sparsely populated area or open water
    - Must be a minimum of 500ft from the nearest obstacle or person
  - Congestion depends on where people are supposed to be
- 91.121 – Altimeter settings
- 91.123 – Compliance with ATC clearances and instructions
  - Read back and clarify
  - Deviations
    - Clearance is amended
    - Traffic alert and collision avoidance
    - Emergency situation exists
  - Notification of deviation
  - "Unable"
- 91.125 – ATC light signals
- 91.126 – Operating on or in the vicinity of an airport in Class G
  - Standard traffic pattern has left hand turns
  - Helicopters and powered parachutes should avoid the traffic pattern
- 91.127 – Operating on or in the vicinity of an airport in Class E
  - Similar to Class G
  - May have FAR 93 noise abatement procedures
- 91.129 – Operating on or in the vicinity of an airport in Class D
  - Must establish and maintain two-way radio communication
- 91.130 – Operation on or in the vicinity of an airport in Class C
  - Must establish and maintain two-way radio communication
  - Mode C transponder with ADS-B out
- 91.131 – Operating on or in the vicinity of an airport within Class B
  - Must establish and maintain two-way radio communication
  - Mode C transponder with ADS-B out
  - A clearance must be received prior to entry
- 91.135 – Operating within Class A airspace
  - Flight must be conducted under instrument flight rules

- Aircraft must be IFR equipped and certified
- Pilot must be IFR certified and current
- Must establish and maintain two-way radio communication
- Mode C transponder with ADS-B out
- A clearance must be received prior to entry
- Altimeter should be set to 29.92 upon entry (ref. 91.121)

- 91.151 – Fuel requirements
  - 30 min reserve during day
  - 45 min reserve during night
- 91.155 – Basic VFR weather minimums
- 91.157 – Special VFR (purpose is to enter or exit an area when the local weather is below VFR minimums, NOT for scud running)
- 91.159 – VFR cruising altitudes
- 91.203 – Civil aircraft certification (ARROW)
- 91.207 – Emergency locator transmitter
  - Shock sensitive
  - 121.5mhz or 243mhz
  - Testing during first 5 mins after the hour
  - Inspected every 12 calendar months
  - Battery replacement
    - 1 cumulative hour
    - 50% of useful life of charge
  - 406mhz ELT
- 91.209 – Aircraft lights
  - Position lights
  - Anti-collision lights
  - Anchor lights
  - Alaska rule
- 91.211 – Use of supplemental oxygen
  - Crewmembers in excess of 30 mins above 12,500MSL
  - Crewmembers above 14,000MSL
  - Available to passengers above 15,000MSL
  - Flash fires
- 91.215 – ATC transponder and altitude reporting equipment
  - Mode C required in
    - Class A, B, and C
    - Within a mode C veil
    - At and above 10,000ft MSL excluding 2,500AGL
  - Transponder must be on if equipped
  - Requirement may be waived upon request to ATC
- 91.225 – ADS-B
  - Required in Class A
  - Required above the ceiling and within Class B and C
  - Required in Class E
    - Over the contiguous US, above 10,000ft MSL
    - Over the gulf of Mexico, above 3,000ft MSL
  - Aircraft certified without an electrical system
  - Operation without ADS-B including special requests to ATC
- 91.303 – Aerobatic flight
  - Abrupt or abnormal maneuvers
  - May not be conducted when
    - over a congested area
    - flight visibility < 3SM
    - below 1500 AGL
    - in controlled airspace over an airport
    - within 4NM of the centerline of a federal airway

- 91.307 – Parachutes and parachuting
  - Required when
    - Bank of > 60° relative to the horizon
    - Pitch of > 30° relative to the horizon
  - Must be approved
  - Packed by an approved packer within the last 60 days if synthetic or 180 days if natural.
- 91.313 – Restricted category aircraft (crop dusters)
- 91.319 – Aircraft having experimental certificates

☐ Aircraft maintenance
- Maintenance is defined and authorized by FAR 43 and appendices
- Only a certificated mechanic may perform maintenance
  - Must be flown by an appropriately rated pilot (includes private pilots) to check operations after any major repairs or alterations
- Owners may perform preventative maintenance
  - Must have the correct manuals
  - Must have the specific/required tools
  - Should have proper training from a certificated mechanic
- Inspections
  - Annual
  - 100hr
  - Pitot/static
  - Transponder
  - ELT and ELT battery
- ATC transponder tests and inspections
- Aircraft maintenance records
- Airworthiness directives

☐ Aircraft accidents and incidents
- NTSB 830 (Title 49 Part 830)
  - *The NTSB's Role in Aviation Safety* by Robert L Sumwalt and Sean L Dalton of the National Transportation Safety Board
    - The NTSB is an independent federal agency, charged by Congress to investigate transportation accidents, determine probable cause, and issue safety recommendations to prevent similar accidents.
    - In some cases the NTSB may delegate a member of the FAA to conduct an investigation on its behalf.
  - 830.1 – Defines the NTSB's authority over accident investigation
  - 830.2 – Defines the following terms
    - Aircraft accident
    - Civil aircraft
    - Fatal injury
    - Incident
    - Operator
    - Public aircraft
    - Serious injury
    - Substantial damage
    - Unmanned aircraft incident
  - 830.5 – A list of criteria mandating immediate notification to the NTSB
    - Any accident
    - Flight control malfunction or failure
    - Inability of required flight crew member to perform duties as a result of injury or illness
    - Failure of a turbine
    - In-flight fire
    - In-flight collision
    - Damage to property other than the aircraft exceeding $25,000

	• Aircraft is overdue and believed to have been involved in an accident • More than 50% loss of the graphical portion of any EFIS device ▪ 830.10 – Preservation of aircraft wreckage ▪ 830.15 – Reports and statements to be filed • Within 10 days of an accident or 7 days if an overdue aircraft is still missing • Upon request o Recommended procedures/best practices ▪ Report any occurrence as an incident to the NTSB through the FAA, as soon as practically possible • Call the local FSDO • Weather briefer - (800)WX-BRIEF • (817)222-5006 – Local field official ▪ Try to avoid moving the aircraft until contact has been made and you have been cleared by an FAA representative. ▪ Discussion of the event or even speculation about the event could be misconstrued as a criminal attempt to obstruct the investigation and may result in charges being filed ☐ TFR (Temporary Flight Restriction) o Types ▪ Disaster or hazard areas ▪ Presidential ▪ Aerial demonstrations and sporting events o Requirements to legally operate ▪ Must be entering or exiting the area ▪ Must be talking with ATC ▪ Must be on a valid flight plan o Sources for TFR information ▪ 1(800)WX-BRIEF ▪ tfr.faa.gov ▪ Electronic flight bags ☐ 61.69 - Glider towing o Must have a private pilot's certificate with a category rating for powered aircraft o Must have logged a minimum of 100 hrs in category, class, or type of towing aircraft o Must have logged at least three flights as the sole manipulator of the controls under supervision of a qualified flight instructor ☐ Flight manuals and other documents ☐ Aeronautical Information Manual
Tasks	☐ Review aeronautical knowledge
Notes	• The requirements for commercial and instrument certificates are included in this lesson so that private pilots will have an understanding of the paths available to them and the purpose for which each certificate was intended. • Airspace (FAA Regs 91.126-91.131) is included in this lesson but is intended to be covered in depth in Ground Lesson No. 5 – Airspace (Coyote Document 16).
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Instructor should verify students understanding of this topic by verbally questioning the student.

PPG 8 of 14 - Emergency Procedures and Equipment Malfunctions

Objective	Prepare the student to analyze and respond to unexpected events in order to prevent serious bodily injury or death.			
Pre-requisites	• N/A			
Approx. Time	**Ground:**	2.0	**Flight:**	N/A
Materials	□ Model aircraft □ Airplane			

Aeronautical knowledge

Discussion

1. Defining an emergency
    a. An emergency is a serious, often unexpected situation that could result in serious bodily injury or death.
    b. A potential emergency is a situation that if not dealt with could result in an emergency
    c. "Flying is hours and hours of boredom punctuated by moments of sheer terror" – Pappy Boyington (WWII Ace who flew P40s and Corsairs)
2. Fly the airplane
    a. If an aircraft is controlled all the way down to the ground and can dissipate its momentum along a distance of at least 100 ft, the chances of survival increase significantly.
        i. Keep your airspeed under control, and avoid stalling the airplane.
        ii. Configure the aircraft appropriately
        iii. Make the airplane go where you want it to go
    b. Evaluate the situation and decide. Listen to advice but remember that the pilot-in-command must choose a course of action.
3. Use of checklists and flows
    a. Flows are simple checklists that should be committed to memory (ie. ABC GUMP), and are useful during times of extremely high workload
    b. Once the aircraft is under control, time permitting, refer to the emergency checklist(s) in the POH.
4. The airplane is expendable
    a. The insurance company owns the airplane
    b. Use the airplane like a suit of armor to protect yourself
    c. Use the terrain to your advantage
5. Declaring an emergency
    a. Don't be afraid to declare an emergency
    b. Declaring an emergency puts resources at your disposal
    c. Don't be afraid of paperwork or of getting in trouble
6. Common Emergencies
    a. Getting lost
        i. Admit that you are lost
        ii. Climb, radio signals are line of sight
        iii. Communicate with ATC or 121.5
        iv. When all other options have been exhausted, select a suitable site and land
    b. Fuel related issues
        i. Fuel gauges are often inaccurate, check fuel levels visually, start a fuel timer, and lean in accordance with the manual
        ii. Fuel starvation occurs when fuel remains in the tanks but cannot get to the

engine

iii. Fuel exhaustion occurs when there is no fuel remaining in the tanks

iv. Improper mixture settings can cause engine roughness or lead to power loss

c. Electrical failures

i. The alternator and battery power everything in the cockpit from lights to radios

ii. The magnetos are completely independent of the aircraft electrical system and will continue to provide spark to the engine

d. Landing gear failure

i. Gear can collapse if the downlock mechanism fail from lack of maintenance or if they are not engaged prior to landing

ii. If one or more gear fails to extend and lock down, it might be better to land with all of the gear completely retracted

iii. Some aircraft dim the downlock lights when the panel lights are turned on. This makes it appear as if the gear are not locked down when they really are ie. “Piper Gotcha”

7. Precautionary and forced landings
    a. Examine the nature of the situation before selecting a place to land
        i. Does the situation require an immediate landing?
        ii. Are there more resources, such as personnel and facilities, available at other landing sites?
    b. If possible, drag the field for obstacles prior to landing
8. Transponder codes
    a. 7700 – General emergency
    b. 7600 – Radio failure
    c. 7500 – Hijacking
9. Light gun signals and loss of radios

Circle the field and wait for a light gun signal from the tower

Description	Signal	Air	Ground
Steady green		Cleared to land	Cleared to takeoff
Steady red		Give way, con't circling	Stop
Flashing green		Return for landing	Cleared to taxi
Flashing red		Taxi clear of runway	Airport unsafe do not land
Flashing white		Not applicable	Return to starting point
Alt. red and green		Use extreme caution	Use extreme caution

Flight Maneuvers

10. Each maneuver should be prefaced with:
    a. Configuring the aircraft (ABC GUMP – Autopilot, Boost pumps, Cowl flaps, Gas, Undercarriage, Mixture, Power/Prop)
    b. Executing a clearing turn to a downwind heading
        i. Purpose is to check the surrounding area for other aircraft and obstacles
        ii. Should consist of two 90° turns, one 180° turn, or any combination of turns necessary to ensure collision avoidance
11. In order to prepare for emergency situations, the pilot of the aircraft should always be aware of nearby airfield locations, and should plan the route of flight accordingly
12. Dealing with engine roughness

a. Memory items (Oh My Gosh, I Can Land, etc.)
    i. Oil – Verify oil pressure and oil temperature are normal
    ii. Mixture – Adjust the mixture
    iii. Gas – Verify fuel flow, turn on boost pump, fullest tank or return to previous tank
    iv. Ignition – Check magnetos
    v. Carburetor heat – Check for carburetor ice
    vi. Land – find a place to land, nearby, and maneuver towards it before the engine quits
b. Refer to the emergency checklist

13. Simulated engine outs
    a. Simulate an engine out
        i. Configure the aircraft and execute a clearing turn
        ii. Reduce power to idle
    b. Configure and fly the aircraft
        i. Establish a glide and trim the aircraft for hands-off flight
        ii. Select an appropriate landing area, within gliding distance, and begin maneuvering to the selected landing area
            1. Do NOT attempt to reach an airport unless one is already known and is within gliding distance (gliding distance should be known before aircraft is flown)
            2. If a road is selected, beware of power lines which are difficult to see from the air and make certain that there is enough room to avoid them
            3. If a field is selected, land as close as safely possible to a road, house, or other access point so that help can reach the aircraft after the forced landing
            4. Use slips, s-turns, circles, and other maneuvers to lose altitude if necessary
            5. Do NOT extend the gear, flaps, or other high drag devices until the field is made
            6. Maintain a stabilized airspeed at V_g during the entire approach
    c. Call for help and set the transponder to code 7700
    d. Time permitting use the emergency checklist
        i. Configure the aircraft for an emergency landing
        ii. Troubleshoot/restart the aircraft engine
    e. Once the field is safely made
        i. Extend the landing gear (if necessary)
        ii. Throw out full flaps
        iii. Turn off the master switch
        iv. Turn off fuel valve
    f. Round-out and level off as if executing a normal landing
    g. Hold the nose off the ground as long as possible and dissipate as much energy as possible prior to touchdown
    h. Touchdown should be made as slowly as possible with a nose high attitude. The nose should be held off the ground for as long as possible in order to prevent the aircraft from flipping over in soft dirt
    i. Once the aircraft has come to a complete stop, make certain everything is off and exit the plane in an orderly fashion

	j. Make certain the ELT is transmitting
Tasks	Review the aeronautical knowledge Role play through a scenario based emergency
Notes	• None
Completion Standard	The lesson is considered complete when the student can successfully define an emergency, demonstrate an understanding of transponder codes and light gun signals, and the instructor has role played through at least one scenario based ground training exercise.

PPG 9 of 14 - Introduction to the E6B

Objective	Teach the student how to make flight and navigation calculations using an E6B flight computer.			
Pre-requisites	☐ N/A			
Approx. Time	**Ground:**	2.0	**Flight:**	N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B) (PHAK) ☐ E6B flight computer			

Ground work

- ☐ What is an E6B?
  - Was invented in the 1930's by Navy Lt. Phillip Dalton
  - Does not require batteries and as thus is a good backup in case of an electrical failure
  - Works by setting up ratios
    - Outer circle is usually quantity or unit
    - Inner circle is usually time
    - Works in multiples of 10
- ☐ Trivia
  - "My eyes are dim I cannot see, I have not got my E-6B with me, over the Valley of the Ruhr". (World War II USAAC ditty)
  - "His computer is the instrument on which he stakes his life ... Don't ask for his computer, for he'd sooner lend his wife". (Navigator's Song, 1943)
  - Star Trek – The Original Series
    - In the episode "The Naked Time", Mr. Spock uses an E-6B to calculate the time of impact of the *Enterprise* with a planet.
    - In the episodes "Mudd's Women" and "Who Mourns for Adonais?", he is seen holding an E-6B.
- ☐ Miscellaneous calculations
  - Converting between statute miles, nautical miles, and kilometers
  - Calculating weight from U.S. gallons (oil/fuel)
  - Converting gallons to liters
  - Temperature conversion scale
  - Calculating density altitude
- ☐ Time/Speed/Distance calculations
  - How far?
    - Set the aircraft speed over 60 (rate)
    - Find the elapsed time on the inner scale and read the distance above it
  - How fast?
    - Set the distance traveled over the time
    - Find the 60 (rate) on the inner scale and read the speed above it
  - How long?
    - Set the aircraft speed over 60 (rate)
    - Find the distance on the outer scale and read the time below it on the inner scale
  - Fuel burn
    - Set the gph (outer scale) over 60 (rate)
    - Find the time on the inner scale and read the gallons burned above it on the outer scale
  - Weight of fuel/oil
    - Set the amount of fuel under the "U.S. gals" mark (outer scale)
    - Find "Fuel lbs" mark (outer scale) and read the weight underneath it
    - For oil remember to convert quarts to gallons
- ☐ Wind triangles
    - Set direction of wind under the "True Index" and Mark the wind velocity above the center of the window.
    - Rotate the window to set the aircraft's true course under "True Index" and slide the wind velocity mark to the aircraft's true airspeed

- Read ground speed under the center of the window and wind correction angle under the wind velocity mark

Sample Problems

	How far?				Fuel		
Speed	Time		Distance	Rate		Total	Weight
152Kts	30mins	=	76NM	17.6gph	=	8.8gals	53lbs
114Kts	14mins	=	27NM	12.2gph	=	2.8gals	17lbs
105Kts	93mins	=	163NM	8.6gph	=	13.3gals	80lbs
96Kts	95mins	=	152NM	7.5gph	=	11.9gals	71lbs
173Kts	235mins	=	678NM	23.1gph	=	90.5gals	543lbs
142Kts	107mins	=	253NM	12.3gph	=	21.9gals	132lbs
96Kts	105mins	=	168NM	8.4gph	=	14.7gals	88lbs
47Kts	35mins	=	27NM	5.5gph	=	3.2gals	19lbs

	How fast?				Fuel		
Distance	Time		Speed	Rate		Total	Weight
113NM	45mins	=	151Kts	17.3gph	=	13.0gals	78lbs
27NM	19mins	=	85Kts	7.6gph	=	2.4gals	14lbs
27NM	12mins	=	135Kts	11.2gph	=	2.2gals	13lbs
315NM	165mins	=	115Kts	8.4gph	=	23.1gals	139lbs
95NM	45mins	=	127Kts	12.2gph	=	9.2gals	55lbs
213NM	119mins	=	107Kts	8.4gph	=	16.7gals	100lbs
157NM	97mins	=	97Kts	7.9gph	=	12.8gals	77lbs
432NM	174mins	=	149Kts	12.3gph	=	35.7gals	214lbs

	How long?				Fuel		
Distance	Speed		Time	Rate		Total	Weight
153NM	111Kts	=	83mins	8.8gph	=	12.1gals	73lbs
177NM	123Kts	=	86mins	11.2gph	=	16.1gals	97lbs
98NM	113Kts	=	52mins	7.6gph	=	6.6gals	40lbs
65NM	173Kts	=	23mins	17.8gph	=	6.7gals	40lbs
253NM	84Kts	=	181mins	6.5gph	=	19.6gals	117lbs
33NM	121Kts	=	16mins	9.1gph	=	2.5gals	15lbs
47NM	84Kts	=	34mins	6.1gph	=	3.4gals	20lbs
1009NM	174Kts	=	348mins	23.4gph	=	135.7gals	814lbs

Wind triangles

Wind Dir.	Velocity		True Crse	Airspeed		Grd Spd	Corr.
020°	15Kts	/	53°	111Kts	=	99Kts	-4°
120°	27Kts	/	275°	143Kts	=	164Kts	-6°
340°	35Kts	/	250°	111Kts	=	104Kts	19°
220°	10Kts	/	180°	133Kts	=	125Kts	3°
340°	11Kts	/	234°	111Kts	=	114Kts	6°
250°	21Kts	/	230°	175Kts	=	154Kts	3°
140°	15Kts	/	63°	143Kts	=	140Kts	6°
080°	17Kts	/	20°	121Kts	=	111Kts	7°

Tasks	Review the aeronautical knowledge
Notes	N/A
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Student should be able to compute a wind triangle and complete basic time/speed/distance problems.

PPG 10 of 14 – Performance/Weight and balance

Objective	Ensure the student understands the factors that affect aircraft's ability to perform.
Pre-requisites	• N/A
Approx. Time	**Ground:** 2.0 **Flight:** N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B) (PHAK)
Aeronautical knowledge	☐ Importance of performance data ..... PHAK 11-1 ☐ Structure of the atmosphere ..... PHAK 11-2 ☐ Atmospheric pressure ..... PHAK 11-2 ☐ Pressure altitude ..... PHAK 11-3 ☐ Density altitude ..... PHAK 11-3 o Effects of pressure on density o Effects of temperature on density o Effects of humidity on density ☐ Performance ..... PHAK 11-5 o Straight-and-level flight o Climb performance (Best angle/best rate) o Range performance (Cruise range and endurance) o Region of reversed command o Takeoff and landing performance o Runway surface and gradient o Water on the runway and dynamic hydroplaning ☐ Performance speeds ..... PHAK 11-18 ☐ Performance charts ..... PHAK 11-19 o Interpolation o Density altitude chart o Takeoff chart o Climb and cruise chart o Crosswind and headwind component chart o Landing chart o Stall speed chart ☐ Transport category aircraft performance ..... PHAK 11-28 ☐ Air carrier obstacle clearance requirements ..... PHAK 11-28 ☐ Introduction ..... PHAK 10-1 ☐ Weight control ..... PHAK 10-1 o Effects of weight ..... PHAK 10-2 o Weight changes ..... PHAK 10-2 o Balance, stability, and center of gravity ..... PHAK 10-2 ▪ Effects of adverse balance on stability and control o Management of weight and balance control ..... PHAK 10-4 o Terms and definitions ..... PHAK 10-4 o Principles of weight and balance computations ..... PHAK 10-5 o Weight and balance restrictions ..... PHAK 10-6 ☐ Determining loaded weight and CG o Computational method o Graph method

	o Table method o Computations with a negative arm o Computations with zero fuel weight o Shifting, adding, and removing weight ▪ $W_{to\_move}/W_{total} = D_{CG\_moves}/D_{obj\_moves}$
Tasks	Review the aeronautical knowledge
Notes	• Standard temperature and pressure: 15°C and 29.92inHG
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Student should be able to perform a density altitude calculation and a weight and balance computation without aid from the instructor.

PPG 11 of 14 - Weather Theory

Objective	Teach the student to understand the importance of weather influences on flight safety and performance.
Pre-requisites	• N/A
Approx. Time	**Ground:** 2.0 **Flight:** N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge (PHAK)
Aeronautical knowledge	☐ Introduction to Weather Theory ..... PHAK 11-1 ☐ Atmosphere ..... PHAK 11-2 o Composition of the atmosphere o Atmospheric Circulation o Atmospheric Pressure ☐ Coriolis Force ..... PHAK 11-3 ☐ Measurement of Atmospheric Pressure ..... PHAK 11-4 ☐ Altitude and Atmospheric Pressure ..... PHAK 11-5 ☐ Wind and Currents ..... PHAK 11-7 o Wind patterns o Convective currents o Effect of obstructions on wind o Low level wind shear o Wind and pressure representation on Surface Weather maps ☐ Atmospheric Stability ..... PHAK 11-12 o Inversions o Moisture and temperature o Relative humidity o Temperature/Dew point relationship o Dew and frost o Fog ☐ Clouds ..... PHAK 11-15 o Ceiling o Visibility o Precipitation ☐ Air masses ..... PHAK 11-18 ☐ Fronts ..... PHAK 11-18 o Warm front o Cold front ▪ Fast moving cold front ▪ Flight toward an approaching cold front ▪ Comparison of cold and warm fronts ▪ Wind shifts o Stationary front o Occluded front o Thunderstorms ..... PHAK 11-23 o Hazards to aircraft ..... PHAK 11-23 ▪ Squall line ▪ Tornadoes ▪ Turbulence ▪ Icing ▪ Hail

	▪ Ceiling and visibility ▪ Effect on altimeters ▪ Lightning ▪ Engine water ingestion
Tasks	Review aeronautical knowledge
Notes	• None
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Instructor should verify students understanding of this topic by verbally questioning the student.

PPG 12 of 14 - Weather services

Objective	To provide the student with the skills and knowledge necessary to interpret weather reports and make safe decisions regarding flight.
Pre-requisites	• PPG 11 of 14 - Weather Theory (Coyote Document 23)
Approx. Time	**Ground:** 2.0 **Flight:** N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge
Aeronautical knowledge	☐ Introduction to Weather Services ..... PHAK 12-1 ☐ Observations ..... PHAK 12-2 o Surface weather Observations o Upper Air Observations o Radar Observations o Satellite ☐ SIGMET ..... PHAK 12-4 ☐ AIRMET ..... PHAK 12-4 ☐ Service Outlets ..... PHAK 12-4 o Flight Service Station (FSS) ▪ www.1800wxbrief.com o Discontinued (but still in the Pilot's Handbook) ▪ Transcribed Information Briefing Service (TIBS) ▪ Direct User Access Terminal Service (DUATS) ▪ En Route Flight Advisory Service (EFAS) ▪ Hazardous Inflight Weather Advisory Service (HIWAS) ▪ Transcribed Weather Broadcast (TWEB) ☐ Weather Briefings ..... PHAK 12-5 o Standard briefing o Abbreviated briefing o Outlook briefing ☐ Aviation Weather Reports ..... PHAK 12-6 o Aviation Routine Weather Report (METAR) o Pilot Weather Report (PIREPs) ☐ Aviation Forecasts ..... PHAK 12-10 o Terminal Aerodrome Forecasts (TAFs) o Area Forecasts (FA) (Graphical representation only) ☐ Inflight Weather Advisories ..... PHAK 12-12 o AIRMETs (WAs) o SIGMETs (WSs) o Convective Significant Meteorological Information (WST) ☐ Winds and Temperature Aloft Forecast (FD) ..... PHAK 12-14 ☐ Weather Charts ..... PHAK 12-15 o Surface Analysis Chart o Weather Depiction Chart o Radar Summary Chart o Significant Weather Prognostic Charts ☐ ATC Weather Displays and Weather Avoidance Assistance ..... PHAK 12-19 ☐ Electronic Flight Displays/Multi-Function Displays ..... PHAK 12-21 o Weather products age and expiration o Next Generation Weather RADAR System

	▪ Level II data products ▪ Level III data products o NEXRAD abnormalities o NEXRAD limitations ▪ Base reflectivity ▪ Resolution display o AIRMET/SIGMET display o Graphical METARs
Tasks	Review aeronautical knowledge
Notes	• Student should be made aware that in-cockpit weather relayed from the ground can be delayed by as much as 15-20 minutes.
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Instructor should verify students understanding of this topic by proposing a route of flight and then requiring the student to obtain a weather briefing.

PPG 13 of 14 - Cross country flight planning and navigation

Objective	Teach the student how to navigate safely to his/her destination without getting lost.			
Pre-requisites	• N/A			
Approx. Time	**Ground:**	3.0	**Flight:**	N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B) (PHAK) ☐ Flight Plan Sheet (Section 6b, current revision) ☐ E6B flight computer ☐ Navigational plotter			
Aeronautical knowledge	☐ Aeronautical charts.....PHAK 16-2 o Sectional charts o VFR terminal charts o World aeronautical charts ☐ Latitude and longitude (meridians and parallels) .....PHAK 16-3 o Time zones o Measurement of direction o Variation o Deviation ☐ Effect of wind .....PHAK 16-8 ☐ Basic calculations .....PHAK 16-11 o Converting minutes to equivalent hours o Time (T = D/G.S.) o Distance (D = G.S. x T) o Ground Speed (G.S. = D/T) o Converting knots to mph o Fuel consumption o Flight computers (Introduction to the E6B) o Plotter ☐ Pilotage .....PHAK 16-12 ☐ Dead reckoning (wind triangles and vector analysis) .....PHAK 16-13 ☐ Flight planning .....PHAK 16-17 o Assembling the necessary material o Weather check o Use of Chart Supplement U.S. o Airplane Flight Manual (AFMS or POH) ☐ Charting the course .....PHAK 16-18 ☐ Filing a VFR flight plan .....PHAK 16-21 ☐ Ground based navigation (radio aids) .....PHAK 16-22 o Very High Omnidirectional Range (VOR) o Course deviation indicator o Horizontal situation indicator o Radio magnetic indicator o Tracking with a VOR o Intercepting courses with a VOR o Tips for using VOR ☐ Global positioning system .....PHAK 16-30 o Selective availability o VFR use of GPS			

	o RAIM capability o Tips for using GPS for VFR operations o VFR waypoints - Lost procedures - Flight diversion
Tasks	- Review the aeronautical knowledge - Complete a flight plan in preparation for Dual Cross Country No. 1
Notes	- N/A
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Student should be able to obtain a weather briefing, fill out a cross country flight plan, and identify any hazards along the route of flight.

PPG 14 of 14 - Aeromedical Factors

Objective	Explain to the student the effects of altitude and aviation on the mental and physical capacities of the human body.			
Pre-requisites	• N/A			
Approx. Time	**Ground:**	2.0	**Flight:**	N/A
Materials	☐ Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25B (PHAK)			
Aeronautical knowledge	☐ Obtaining a medical certificate ☐ Health and physiological factors affecting pilot performance ..... PHAK 17-2 o Hypoxia ..... PHAK 17-3 ▪ Hypoxic ▪ Hypemic ▪ Stagnant ▪ Histotoxic ▪ Symptoms and treatment of hypoxia o Hyperventilation ..... PHAK 17-4 o Middle ear and sinus problems ..... PHAK 17-5 o Spatial disorientation and illusions ..... PHAK 17-6 ▪ Vestibular illusions ▪ Visual illusions o Postural considerations ..... PHAK 17-8 o Demonstration of spatial disorientation ..... PHAK 17-8 ▪ Climbing while accelerating ▪ Climbing while turning ▪ Diving while turning ▪ Tilting to right or left ▪ Reversal of motion ▪ Diving or rolling beyond the vertical plane (Do NOT demonstrate) o Coping with spatial disorientation ..... PHAK 17-9 o Optical illusions ..... PHAK 17-10 ▪ Runway width illusion ▪ Runway and terrain sloping illusion ▪ Featureless terrain illusion ▪ Water refraction ▪ Haze ▪ Fog ▪ Ground lighting illusions o How to prevent landing errors due to optical illusions ..... PHAK 17-10 o Motion sickness ..... PHAK 17-12 o Carbon monoxide poisoning ..... PHAK 17-12 o Stress ..... PHAK 17-12 o Fatigue ..... PHAK 17-13 o Exposure to chemicals ..... PHAK 17-13 ▪ Hydraulic fluid ▪ Engine oil ▪ Fuel o Dehydration and heatstroke ..... PHAK 17-14 o Alcohol ..... PHAK 17-15 o Drugs ..... PHAK 17-16			

	o Altitude induced decompression sickness ..... PHAK 17-18 ▪ Scuba diving Vision in Flight ..... PHAK 17-19 o Vision types ..... PHAK 17-19 ▪ Photopic vision ▪ Mesopic vision ▪ Scotopic vision o Central blind spot ..... PHAK 17-21 o Empty field myopia ..... PHAK 17-22 o Night vision ..... PHAK 17-22 ▪ Night blind spot ▪ Dark adaptation ▪ Scanning techniques ▪ Night vision protection ▪ Self-imposed stress ▪ Distance estimation and depth perception ▪ Binocular cues o Night vision illusions ..... PHAK 17-26 ▪ Autokinesis ▪ False horizon ▪ Reversible perspective illusion ▪ Size-distance illusion ▪ Fascination (fixation) ▪ Flicker vertigo o Night landing illusions ..... PHAK 17-27
Tasks	Review aeronautical knowledge
Notes	• Instructor should also include somatosensory system and the illusions that can occur during a turn when the centrifugal forces cause the aircraft floor to appear to be “down”.
Completion standard	The lesson is considered complete when the student has accomplished the tasks set forth in the lesson plan. Instructor should verify students understanding of this topic by verbally questioning the student.