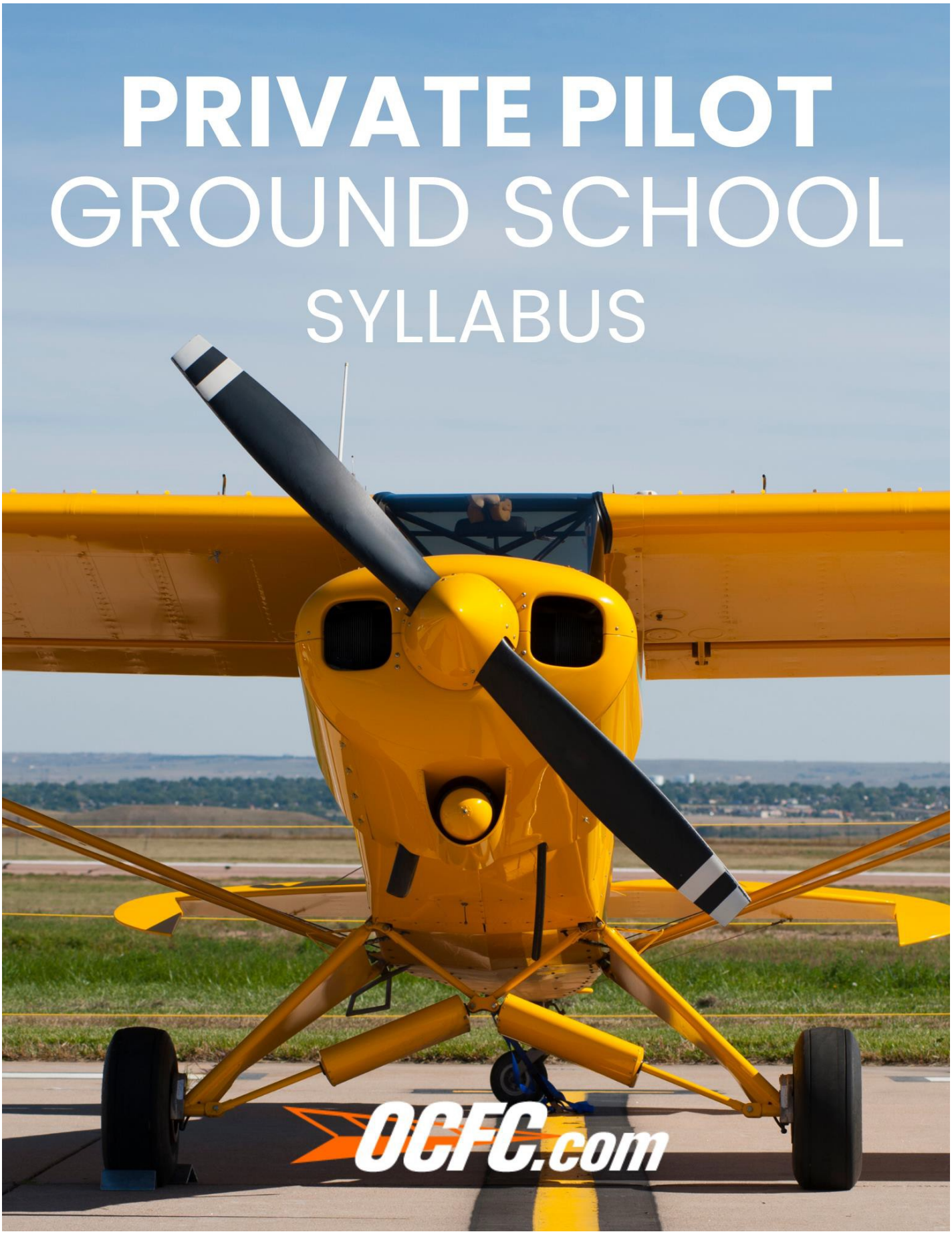
PRIVATE PILOT GROUND SCHOOL

SYLLABUS



Private Pilot Ground School

Course Objective:
Flying for fun or professionally is incredibly rewarding. It takes a lot of dedication, training, and integrity to maintain a safe environment for you and the people around you. This course is designed to help the student pilot prepare for the Private Pilot knowledge exam required by the Federal Aviation Administration. Additionally, the ground school course may serve as a source of supplemental training to those who have already completed a ground school course or may already possess a private pilot certificate. For those seeking a graduation certificate, one will be issued upon successful completion of the course. Both the Private Pilot Knowledge test and Practical Test are required by 14 CFR 61.103 to satisfy the requirements set by the FAA to receive a private pilot certificate.

Required Materials:
- Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)
- Current Local Sectional and Terminal Area Chart
- Current Chart Supplement for your region
- Mechanical E6-B Flight Computer
- Sectional Plotter
- Aeronautical Chart User's Guide
- Create accounts to access weather briefings at aviationweather.gov and 1800wxbrief.com

Suggested Materials:
- Private Pilot Airman Certification Standards FAA-S-ACS-6 (as amended)
- Airman Knowledge Testing Supplement FAA-CT-8080-2 (as amended)
- Notebook or Electronic Device for taking notes
- Knowledge Test Prep Book
- Pens/Pencils/Highlighters/Eraser/Page tabs

Format:
The Private Pilot Ground School is a 9-week course that meets twice per week for two hours each session with breaks as needed. The ground school consists of three stages. **Stage one** covers chapters 1 and 3-8 of the Pilot's Handbook of Aeronautical Knowledge. **Stage two** covers chapters 9-13 of the Pilot's Handbook of Aeronautical Knowledge. **Stage three** covers chapters 14-17 and chapter 2 of the Pilot's Handbook of Aeronautical Knowledge. At the end of stages one and two, an exam is administered to cover the respective chapters. The stage three exam is a comprehensive final exam given on the last official day of class. The course totals 36.5 hours of ground training including presented material and three exams in preparation for the FAA knowledge test. There are required readings and assignments prior to each class to ensure familiarization of material and a building block style of learning.

Missed Classes
In the event a student misses no more than two regularly scheduled ground lessons, that student may complete the missed ground lesson by scheduling time with an authorized instructor to cover the lesson that was missed during absence.

Course Completion Standard:
To be considered eligible to receive the course completion certificate, Orange County Flight Center requires a minimum grade of 80% on the final exam and all lessons completed.

Table of Contents

Stage One

Stage One Objectives:
During this stage, the student will be introduced to pilot training, pilot certification, private pilot privileges, limitations, medical certificate requirements, basic aerodynamics, airplane components, systems, and instruments as they pertain to a light airplane.

Stage One Completion standards:
Completion of this stage will be verified by passing the stage one exam with a minimum score of 70%. The instructor will review each incorrect response to ensure an adequate understanding of the missed material prior to proceeding to the next stage.

Ground Lesson 1: Introduction to Flying

Study Assignment: Pilot's Handbook of Aeronautical Knowledge
Chapter 1, pages 1-24

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 1, Pages 1-24
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including pilot training, certification requirements, and opportunities within aviation.

Lesson Elements:

Chapter 1

- Applicable Federal Aviation Regulations for private pilot privileges, limitations, and flight operations
- Applicable subject of the "Aeronautical Information Manual" and the appropriate FAA advisory circulars
- History of the Federal Aviation Administration (FAA)
- The Role of the FAA
- The Code of Federal Regulations (CFR)
- Aeronautical Information Manual (AIM)
- Handbooks
- Advisory Circulars (ACs)
- Flight Publications
- Pilot and Aeronautical Information
- Notices to Airmen (NOTAMs)
- Aircraft Classifications
- Pilot Certifications, privileges, and limitations
- Commercial Pilot
- Airline Transport Pilot
- The Student Pilot Requirements
- Medical Certification Requirements
- Becoming a Pilot
- Knowledge and Skill Tests
- Knowledge Tests
- When To Take the Knowledge Test
- Practical Test
- When To Take the Practical Test
- Who Administers the FAA Practical
- Role of the Certificated Flight Instructor
- Role of the Designated Pilot Examiner

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 2: Principles & Aerodynamics of Flight

Study Assignment: Pilot's Handbook of Aeronautical Knowledge
Chapter 4, Pages 1-9,
Chapter 5, Pages 1-51

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 4, Pages 1-9
Chapter 5, Pages 1-51
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding lesson elements including the four forces acting on an airplane, ground effect, stability, and the aerodynamics of maneuvering flight.

Lesson Elements:

Chapter 4

- Stall awareness, sin entry, spins, and spin recovery techniques.
- Structure of the Atmosphere
- Air is a Fluid
- Viscosity
- Friction
- Pressure
- Atmospheric Pressure
- Pressure Altitude
- Density Altitude
- Theories in the Production of Lift
- Newton's Basic Laws of Motion.
- Bernoulli's Principle of Differential Pressure
- Airfoil Design

Chapter 5

- Four Forces Acting on the Aircraft
- Wingtip Vortices
- Ground Effect
- Axes of an aircraft
- Moment and Moment Arm
- Aircraft Design Characteristics
- Stability
- Effect of Wing Planform
- Aerodynamic Forces in Flight Maneuvers
- Stalls
- Angle of Attack Indicators
- Basic Propeller Principles
  - Left turning tendencies.
- Load Factors
  - Vg Diagram
- Rate of Turn
- Radius of Turn
- Weight and Balance
- Effect of Weight on Stability and Controllability
- Effect of Load Distribution
- Boundary Layer

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 3: Aircraft Systems (part 1)

Study Assignments: Pilot's Handbook of Aeronautical Knowledge
Chapter 3, 1-13
Chapter 6, 1-12
Chapter 7, 1-7

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 3, Pages 1-9
Chapter 6, Pages 1-12
Chapter 7, Pages 1-7
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including airplane components, flight controls, the powerplant and related systems.

Lesson Elements:

- ☐ Principles of aerodynamics, powerplants and aircraft systems
- ☐ **Chapter 3**- Aircraft Construction
- ☐ Lift and Basic Aerodynamics
- ☐ Major Components
- ☐ Types of Aircraft Construction

Chapter 6- Flight Controls

- ☐ Flight Control Systems
- ☐ Flight Controls
- ☐ Primary Flight Controls
- ☐ Secondary Flight Controls
- ☐ Autopilot

Chapter 7

- ☐ Powerplants
- ☐ Reciprocating Engines
- ☐ Propellers
- ☐ Induction Systems
- ☐ Mixture Control
- ☐ Carburetors
- ☐ Outside Air Temperature Gauge
- ☐ Fuel Injection Systems
- ☐ Superchargers and Turbosuperchargers

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 4: Aircraft Systems (part 2)

Study Assignments: Pilot's Handbook of Aeronautical Knowledge
Chapter 7, Pages 15-41

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 7, Pages 15-41
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including the ignition, oil, electrical, fuel, and hydraulic systems.

Lesson Elements:
Chapter 7- Aircraft Systems (continued)

- ☐ Principles of aerodynamics, powerplants and aircraft systems
- ☐ Ignition System
- ☐ Oil Systems
- ☐ Engine Cooling Systems
- ☐ Exhaust Systems
- ☐ Starting System Combustion
- ☐ Full Authority Digital Engine Control (FADEC)
- ☐ Turbine Engines
- ☐ Turbine Engine Operational Considerations
- ☐ Performance Comparison
- ☐ Airframe Systems
- ☐ Fuel Systems
- ☐ Prevention Procedures
- ☐ Refueling Procedures
- ☐ Heating System
- ☐ Electrical System
- ☐ Hydraulic Systems
    - Landing Gear
    - Tricycle Landing Gear
    - Tailwheel Landing Gear
    - Fixed and Retractable Landing Gear
- ☐ Brakes
- ☐ Pressurized Aircraft
- ☐ Oxygen Systems
- ☐ Anti-Ice and Deice

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 5: Flight Instruments

Study Assignments: Pilot's Handbook of Aeronautical Knowledge
Chapter 8, Pages 1-28

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 8, Pages 1-28
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including pitot-static and gyroscopic instruments and associated errors.

Lesson Elements:

Chapter 8- Flight Instruments

- Pitot-Static Flight Instruments
- Impact Pressure Chamber and Lines
- Static Pressure Chamber and Lines
- Altimeter
- Principle of Operation
- Effect of Nonstandard Pressure and Temperature
- Setting the Altimeter
- Altimeter Operation
- Types of Altitude
- Instrument Check
- Vertical Speed Indicator (VSI)
- Principle of Operation
- Instrument Check
- Airspeed Indicator (ASI)
- Airspeed Indicator Markings
- Other Airspeed Limitations
- Instrument Check
- Blockage of the Pitot-Static System
- Blocked Pitot System
- Blocked Static System
- Electronic Flight Display (EFD)
- Gyroscopic Flight Instruments
- Gyroscopic Principles
- Angle of Attack Indicators
- Magnetic Compass
    - Magnetic Compass Errors
- Outside Air Temperature (OAT) Gauge

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 6: Stage 1 Exam

Study Assignments:
Review elements from lessons 1-5, including terms and practice questions.

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information along with a 30-question multiple choice written exam.

Recommended Presentation Sequence:
Review Stage one elements - (0.5 hour)
Stage one Exam- (1:00 Hour)
Correct Stage one Exam- (0.5 hour)

Lesson Objective: During this lesson, there will be a review of the material presented in class. Students will have the opportunity to ask questions. The stage one exam will be administered.

Lesson Elements: Stage One Exam

- Review stage one key principles
  - Pilot Certification
  - Private pilot privileges
  - Private pilot limitations
  - Medical Certificate Requirements
  - Basic aerodynamics
  - Airplane components
  - Airplane systems
  - Airplane instruments
- Stage one written exam
- Review and correct missed items

Completion Standards: By the end of the class period, the student will have completed the stage one exam with a minimum score of 70%. The instructor will review each incorrect response to ensure an adequate understanding of the missed material prior to proceeding to the next stage.

Stage Two

Stage Two Objectives:
During this stage, the student will be introduced to aircraft documents, weight and balance procedures, aircraft performance, weather theory and aviation weather services.

Stage Two Completion standards:
Completion of this stage will be verified by completing the stage two exam with a minimum score of 70%. The instructor will review each incorrect response to ensure an adequate understanding of the missed material prior to proceeding to the next stage.

Ground Lesson 7: Aircraft Documents and Weight & Balance

Study Assignments: Pilot's Handbook of Aeronautical Knowledge
Chapter 9, Pages 1-13
Chapter 10, Pages 1-11

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 9, Pages 1-13
Chapter 10, Pages 1-11
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including flight manuals, documents and weight and balance principles.

Lesson Elements:

Chapter 9- Flight Manuals and other Documents

- Airplane Flight Manuals (AFM)
- Aircraft Documents
- Certificate of Aircraft Registration
- Airworthiness Certificate
- Aircraft Maintenance and Inspections
- Minimum Equipment Lists (MEL) and Operations with Inoperative Equipment
- Preventive Maintenance
- Maintenance Entries
- Repairs and Alterations
- Special Flight Permits
- Airworthiness Directives (ADs)
- Aircraft Owner/Operator Responsibilities

Chapter 10- Weight and Balance

- Weight and balance computations
- Weight Control
- Effects of Weight
- Weight Changes
- Balance, Stability, and Center of Gravity
- Effects of Adverse Balance
- Stability & Control
- Management of Weight and Balance Control
- Terms and Definitions
- Principles of Weight and Balance Computations
- Weight and Balance Restrictions
- Determining Loaded Weight and CG
- Computations with a Negative Arm
- Computations with Zero Fuel Weight
- Shifting, Adding, and Removing Weight
- Weight Shift and Change

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 8: Aircraft Performance

Study Assignments: Pilot's Handbook of Aeronautical Knowledge
Chapter 11 pages 1-28

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 11, Pages 1-28
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including performance charts and predicting aircraft performance.

Lesson Elements:
Chapter 11

- Importance of Performance Data
- Structure of the Atmosphere
- Atmospheric Pressure
- Pressure Altitude
- Density Altitude
- Effects of Pressure on Density
- Effects of Temperature on Density
- Effects of Humidity (Moisture) on Density
- Performance
- Straight-and-Level Flight
- Climb Performance
- Angle of Climb (AOC)
- Rate of Climb (ROC)
- Climb Performance Factors
- Range Performance
- Region of Reversed Command
- Takeoff and Landing Performance
- Runway Surface and Gradient
- Water on the Runway and Dynamic Hydroplaning
- Takeoff & Landing Performance
- Performance Speeds
- Performance Charts
- Interpolation
- Density Altitude Charts
- Effects of density altitude on takeoff and climb performance.
- Takeoff Charts
- Climb and Cruise Charts
- Crosswind and Headwind Component Chart
- Landing Charts
- Stall Speed Performance Charts

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 9: Weather Theory

Study Assignments: Pilot's Handbook of Aeronautical Knowledge
Chapter 12 pages 1-25

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 12, Pages 1-25
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with weather theory, including the atmosphere.

Lesson Elements:
Recognition of critical weather situations from the ground and in flight, windshear avoidance and the procurement and use of aeronautical weather reports and forecasts

Chapter 11

- ☐ Atmosphere
- ☐ Composition of the Atmosphere, Circulation, and Pressure
- ☐ Coriolis Force
- ☐ Measurement of Atmosphere Pressure
- ☐ Altitude and Atmospheric Pressure
- ☐ Altitude and Flight
- ☐ Altitude and the Human Body
- ☐ Wind Currents and Patterns
- ☐ Convective Currents
- ☐ Effect of Obstructions on Wind
- ☐ Low-Level Wind Shear
- ☐ Wind and Pressure Representation on Surface Weather Maps
- ☐ Atmospheric Stability
- ☐ Inversion
- ☐ Moisture and Temperature
- ☐ Relative Humidity
- ☐ Temperature/Dew Point Relationship
- ☐ Methods by Which Air Reaches the Saturation Point
- ☐ Dew and Frost
- ☐ Fog
- ☐ Clouds
- ☐ Ceiling
- ☐ Visibility
- ☐ Precipitation
- ☐ Air Masses
- ☐ Fronts
- ☐ Thunderstorms
- ☐ Tornadoes
- ☐ Turbulence
- ☐ Icing
- ☐ Hail
- ☐ Ceiling and Visibility
- ☐ Effect on Altimeters
- ☐ Lightning

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at

the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 10: Aviation Weather Services

Study Assignments: Pilot's Handbook of Aeronautical Knowledge
Chapter 13, Pages 1-24

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 13, Pages 1-24
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including the forecasting process, printed reports/forecasts, graphic weather products and sources of weather information.

Lesson Elements:

Chapter 13

- Recognition of critical weather situations from the ground and in flight, windshear avoidance and the procurement and use of aeronautical weather reports and forecasts
- Observations
- Surface Aviation Weather Observations
- Air Route Traffic Control Center (ARTCC)
- Upper Air Observations
- Radar Observations
- Satellite
- Service Outlets
- Weather Briefings
- Aviation Weather Reports:
- Weather Charts
- Surface Analysis Chart
- Weather Depiction Chart
- Significant Weather Prognostic Charts
- ATC Radar Weather Displays
- Weather Avoidance Assistance
- Electronic Flight Displays (EFD) /Multi-Function Display (MFD) Weather
- Pilot Responsibility

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 11: Stage 2 Exam

Study Assignments:
Review elements from lessons 9-13, including terms and practice questions.

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information along with a 30-question multiple choice written exam.

Recommended Presentation Sequence:
Review stage two material - (0.5 hours)
Stage two exam- (1:00 Hour)
Correct stage two exam- (0.5 hours)

Lesson Objective: During this lesson, there will be a review of the material presented in class. Students will have the opportunity to ask questions. The stage two exam will be administered and corrected.

Lesson Elements: Stage two Exam

- Review stage key principles
    - Aircraft documents
    - Weight and balance procedures
    - Aircraft performance
    - Weather theory
    - Aviation weather services
- Administer stage two written exam.
- Review and correct missed items

Completion Standards: By the end of the class period, the student will have completed the stage two exam with a minimum score of 70%. The instructor will review each incorrect response to ensure an adequate understanding of the missed material prior to proceeding to the next stage.

Stage Three

Stage Three Objectives:
During this stage, the student will be introduced to airport operations, airspace, navigation, aeromedical factors, and aeronautical decision making.

Stage Three Completion Standards:
Completion of this stage will be verified by passing the stage three final exam with a minimum score of 70%. The instructor will review each incorrect response to ensure an adequate understanding of the missed material prior to proceeding to the next stage.

Ground Lesson 12: Airport Operations

Study Assignment: Pilot's Handbook of Aeronautical Knowledge
Chapter 14, pages 1-38

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 14, Pages 1-38
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including airport categories, markings, signs, lighting and incursion avoidance.

Lesson Elements:

Chapter 14

- ☐ Radio Communication Procedures
- ☐ Safe and efficient operation of aircraft, including collision avoidance, and recognition and avoidance of wake turbulence.
- ☐ Airport Categories
- ☐ Types of Airports
- ☐ Sources for Airport Data
- ☐ Airport Markings and Signs
- ☐ Runway Markings and Signs
- ☐ Relocated Runway Threshold
- ☐ Displaced Threshold
- ☐ Runway Safety Area
- ☐ Land and Hold Short Operations (LAHSO)
- ☐ Taxiway Markings and Signs
- ☐ Other Markings
- ☐ Airport Signs, Lighting and Beacon
- ☐ Approach Light Systems
- ☐ Runway Lighting
- ☐ Control of Airport Lighting
- ☐ Taxiway Lights
- ☐ Omnidirectional
- ☐ Clearance Bar Lights
- ☐ Runway Guard Lights
- ☐ Stop Bar Lights
- ☐ Obstruction Lights
- ☐ New Lighting Technologies
- ☐ Wind Direction Indicators
- ☐ Traffic Patterns
- ☐ Radio Communication
- ☐ Lost Communication Procedures
- ☐ Air Traffic Control (ATC) Services
- ☐ Primary Radar
- ☐ ATC Radar Beacon System (ATCRBS)
- ☐ Transponder
- ☐ Automatic Dependent Surveillance– Broadcast (ADS-B)
- ☐ Radar Traffic Advisories
- ☐ Wake Turbulence
- ☐ Collision Avoidance
- ☐ Runway Incursion Avoidance
- ☐ Pre-Landing, Landing, and After-Landing
- ☐ Engineered Materials Arresting Systems (EMAS)

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at

the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 13: Airspace

Study Assignment: Pilot's Handbook of Aeronautical Knowledge
Chapter 15, Pages 1-11

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 15, Pages 1-11
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including airspace categories, classes, special use airspace and operating requirements.

Lesson Elements:
Chapter 15

- Controlled Airspace
  - Class A Airspace
  - Class B Airspace
  - Class C Airspace
  - Class D Airspace
  - Class E Airspace
- Uncontrolled Airspace
  - Class G Airspace
- Special Use Airspace
  - Prohibited Areas
  - Restricted Areas
  - Warning Areas
  - Military Operation Areas (MOAs)
  - Alert Areas
  - Controlled Firing Areas (CFAs)
- Other Airspace Areas
  - Local Airport Advisory (LAA)
  - Military Training Routes (MTRs)
  - Temporary Flight Restrictions (TFR)
  - Published VFR Routes
  - Terminal Radar Service Areas (TRSAs)
  - National Security Areas (NSAs)
- Air Traffic Control and the National Airspace System
- Coordinating the Use of Airspace
- Operating in the Various Types of Airspace
- Basic VFR Weather Minimums
- Operating Rules and Pilot/Equipment Requirements
- Ultralight Vehicles
- Unmanned Free Balloons
- Unmanned Aircraft Systems
- Parachute Jumps

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 14: Navigation (part 1)

Study Assignments: Pilot's Handbook of Aeronautical Knowledge
Chapter 16, Pages 1-15

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 16, Pages 1-15
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including the principles of pilotage and dead reckoning.

Lesson Elements:

Chapter 16

- Aeronautical charts for VFR navigation using pilotage, dead reckoning, and navigation systems.
- Aeronautical Charts
- Sectional Charts
- VFR Terminal Area Charts
- World Aeronautical Charts
- Latitude and Longitude (Meridians and Parallels)
- Time Zones
- Measurement of Direction
- Variation
- Magnetic Variation
- Magnetic Deviation
- Deviation
- Effect of Wind
- Basic Calculations
- Converting Minutes to Equivalent Hours
  - Time T = D/GS
  - Distance D = GS X T
  - GS GS = D/T
  - Converting Knots to Miles Per Hour
- Fuel Consumption
- Flight Computers
- Plotter
- Pilotage
- Dead Reckoning
- Wind Triangle or Vector Analysis

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 15: Navigation (part 2)

Study Assignment: Pilot's Handbook of Aeronautical Knowledge
Chapter 16, Pages 17-35

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 16, Pages 17-35
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding all lesson elements including flight planning, charting a course, VOR and GPS navigation.

Lesson Elements:

Chapter 16

- ☐ Aeronautical charts for VFR navigation using pilotage, dead reckoning, and navigation systems.
- ☐ Flight Planning
- ☐ Assembling Necessary Material
- ☐ Weather Check
- ☐ Use of Chart Supplement U.S. (formerly Airport/Facility Directory)
- ☐ Airplane Flight Manual or Pilot's Operating Handbook (AFM/POH)
- ☐ Charting the Course
- ☐ Steps in Charting the Course
- ☐ Filing a VFR Flight Plan
- ☐ Ground-Based Navigation
- ☐ Very High Frequency (VHF) Omnidirectional Range (VOR)
- ☐ Using the VOR
- ☐ Course Deviation Indicator (CDI)
- ☐ Horizontal Situation Indicator
- ☐ Radio Magnetic Indicator (RMI)
- ☐ Tracking With VOR
- ☐ Tips on Using the VOR
- ☐ Time and Distance Check from a Station Using a RMI
- ☐ Time and Distance Check from a Station Using a CDI
- ☐ Course Intercept
- ☐ Rate of Intercept
- ☐ Angle of Intercept
- ☐ Distance Measuring Equipment (DME)
- ☐ VOR/DME RNAV
- ☐ Automatic Direction Finder (ADF)
- ☐ Global Positioning System
- ☐ Selective Availability
- ☐ VFR Use of GPS
- ☐ RAIM Capability
- ☐ Tips for Using GPS for VFR Operations
- ☐ VFR Waypoints
- ☐ Lost Procedures
- ☐ Flight Diversion

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 16: Aeromedical Factors

Study Assignments: Pilot's Handbook of Aeronautical Knowledge
Chapter 10, Pages 1-29

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 17, Pages 1-29
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding all lesson elements including human physiology as it relates to aviation, illusions, effects of drugs and alcohol, and night operations.

Lesson Elements:

Chapter 17

- ☐ Obtaining a Medical Certificate
- ☐ Health and Physiological Factors Affecting Pilot Performance
- ☐ Hypoxia
- ☐ Symptoms of Hypoxia
- ☐ Treatment of Hypoxia
- ☐ Hyperventilation
- ☐ Middle Ear and Sinus Problems
- ☐ Spatial Disorientation and Illusions
- ☐ Vestibular Illusions
- ☐ Visual Illusions
- ☐ Postural Considerations
- ☐ Demonstration of Spatial Disorientation
- ☐ Climbing While Accelerating
- ☐ Climbing While Turning
- ☐ Diving While Turning
- ☐ Tilting to Right or Left
- ☐ Reversal of Motion
- ☐ Diving or Rolling Beyond the Vertical Plane
- ☐ Coping with Spatial Disorientation
- ☐ Optical Illusions
- ☐ How To Prevent Landing Errors Due to Optical Illusions
- ☐ Motion Sickness
- ☐ Carbon Monoxide (CO) Poisoning
- ☐ Stress
- ☐ Fatigue
- ☐ Exposure to Chemicals
- ☐ Dehydration and Heatstroke
- ☐ Alcohol & Drugs
- ☐ Altitude-Induced Decompression Sickness (DCS)
- ☐ Vision in Flight
- ☐ Night Vision
- ☐ Self-Imposed Stress
- ☐ Distance Estimation and Depth Perception
- ☐ Binocular Cues
- ☐ Night Vision Illusions
- ☐ Enhanced Night Vision Systems
- ☐ Synthetic Vision System
- ☐ Enhanced Flight Vision System

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 17: Aeronautical Decision Making (ADM)

Study Assignments: Pilot's Handbook of Aeronautical Knowledge
Chapter 2, Pages 1-32

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 2, Pages 1-32
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including risk management, aeronautical decision making and associated principles.

Lesson Elements:

Chapter 2

- ☐ Aeronautical decision making and judgment.
- ☐ Accident reporting requirements of the National Transportation Safety Board
- ☐ Risk Management
- ☐ Crew Resource Management (CRM) and Single Pilot Resource Management
- ☐ Hazard and Risk
- ☐ Hazardous Attitudes and Antidotes
- ☐ Risk
- ☐ Assessing Risk
- ☐ Mitigating Risk
- ☐ The PAVE Checklist
- ☐ Human Factors
- ☐ Human Behavior
- ☐ The Decision-Making Process
- ☐ Single-Pilot Resource Management (SRM)
- ☐ The 5 Ps Check
- ☐ Perceive, Process, Perform (3P) Model
- ☐ PAVE Checklist: Identify Hazards and Personal Minimums
- ☐ CARE Checklist: Review Hazards and Evaluate Risks
- ☐ TEAM Checklist: Choose and Implement Risk Controls
- ☐ The DECIDE Model
- ☐ Decision-Making in a Dynamic Environment
- ☐ Automatic Decision-Making
- ☐ Operational Pitfalls
- ☐ Stress Management
- ☐ Use of Resources (Internal/external)
- ☐ Situational Awareness
- ☐ Obstacles to Maintaining Situational Awareness
- ☐ Workload Management
- ☐ Managing Risks
- ☐ Automation
- ☐ Autopilot Systems
- ☐ Getting Beyond Rote Workmanship
- ☐ Understand the Platform
- ☐ Managing Aircraft Automation
- ☐ Information Management
- ☐ Enhanced Situational Awareness
- ☐ Automation Management
- ☐ Risk Management

Completion Standards: By the end of the class period, the student will have will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 18: Final Exam

Study Assignments:
Review all elements covered throughout the course, including terms, stage exams and practice questions.

Text Reference:
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)

Presentation Format: The final exam will be administered in-person during the class period as a comprehensive 60-question multiple choice written exam.

Recommended Presentation Sequence:
Administer Stage Three Exam- (2:00 hours)
Review and correct stage three exam- (0.5 hour)

Lesson Objective: During this lesson, students will have the opportunity to ask questions. The stage three exam will be administered.

Lesson Elements: Stage three Exam
- Stage three written exam
- Review and correct missed items

Completion Standards: The student will complete the written exam with a minimum score of 80% to be considered eligible to receive a completion certificate and the instructor will review incorrect answers to ensure that the student understands the item(s) missed.

Ground Log Record

Name: _____

Lesson	Date	Topic of Instruction	Time	CFI Name/ No./ Exp
1			2	
2			2	
3			2	
4			2	
5			2	
6			2	
7			2	
8			2	
9			2	
10			2	
11			2	
12			2	
13			2	
14			2	
15			2	
16			2	
17			2	
18			2	