Twin Oaks Private Pilot Ground School

Lesson 1: Aerodynamics

- Basic principles of aerodynamics: lift, drag, weight, and thrust
- Types of drag: parasitic and induced, and how they affect flight
- Stability, control, and maneuvering flight
- Concepts of stalls, spins, and the effects of load factor on the aircraft

Lesson 2: Airplane Engines and Electrical System

- Overview of engine components and operation (piston engines, fuel systems, carbureted vs. fuel-injected)
- Basic understanding of the electrical system, including alternators, batteries, and circuit breakers
- Engine instruments and indications of abnormal operations
- Troubleshooting basic engine and electrical issues

Lesson 3: Flight Instruments

- Understanding the six basic flight instruments: airspeed indicator, altimeter, vertical speed indicator, attitude indicator, heading indicator, and turn coordinator
- Pitot-static system and gyroscopic instruments
- Instrument errors and limitations, such as altimeter setting and gyroscopic precession
- Basic troubleshooting for instrument failures

Lesson 4: Federal Aviation Regulations (FARs)

- Overview of 14 CFR Part 61 and Part 91 rules relevant to Private Pilots
- Preflight action and required inspections (AVIATE, ARROW, and VFR equipment requirements)
- Right-of-way rules, fuel requirements, and minimum altitudes
- Understanding the concept of pilot-in-command and legal responsibilities

Lesson 5: Airport and Radio Operations

- Airport layout and operations, including runway and taxiway markings, signs, and lighting systems
- Non-towered and towered airport procedures, including traffic patterns and CTAF/UNICOM use
- ATC communication basics: phraseology, making radio calls, and handling instructions
- Understanding and interpreting ATIS, AWOS, and ASOS broadcasts

Lesson 6: Airspace and Sectional Charts

- Types of airspace (Classes A through G) and their operational requirements
- Special use airspace, such as MOAs, restricted areas, and prohibited areas
- Reading and interpreting sectional charts, symbols, and VFR waypoints
- TFRs, NOTAMs, and staying up-to-date with airspace changes

Lesson 7: Weather Fundamentals

- Basics of weather theory: atmospheric composition, pressure systems, and fronts
- Understanding aviation weather hazards such as thunderstorms, wind shear, and turbulence
- Introduction to cloud formations and their implications for flight
- Practical application of weather theory for safe flight planning

Lesson 7: Aviation Weather Reports and Forecasts

- Accessing and interpreting METARs, TAFs, PIREPs, and graphical weather products
- Reviewing weather briefings and understanding their components
- Using tools like the Aviation Weather Center and Flight Service for preflight planning
- Weather decision-making strategies for VFR flight

Lesson 8: Cross-Country Flight Planning

- Basics of VFR cross-country planning, including route selection, fuel planning, and alternates
- Using navigation tools: plotters, E6B flight computers, and GPS
- Calculating headings, groundspeed, and estimated time en route
- Using flight logs and staying organized for efficient flight

Lesson 9: Performance and Weight & Balance

- Interpreting performance charts for takeoff, climb, cruise, and landing
- Weight and balance concepts, including CG location and how it affects stability
- Calculating weight and balance for different loading scenarios
- Understanding density altitude and its effects on aircraft performance

Lesson 10: Wrap Up and Review

- Class will go through a Mock Written
- Review Gouges (Write ups of pervious checkrides)
- Review any questions
- Review Mock Checkride Scenario