Willamette Aviation: Flight Lab Syllabus

Lab 1: The Four Fundamentals

Practice climbs, straight-and-level flight, turns, and descents. Master the takeoff roll. Understand the three adverse effects in a turn — and what corrective inputs are required. Learn what the rudder does, and why it's necessary. Climb and descend on course.

- AFH 1: Introduction to Flight Training
- AFH 3: Basic Flight Maneuvers
- AFH 5: Takeoffs and Departure Climbs
- PHAK 5: Aerodynamics of Flight
- PHAK 6: Flight Controls
- PHAK 8: Flight Instruments

Instructor comments: _____

Lab 2: Slow Flight

Fly at any viable airspeed. Learn what flaps do, and when to use them. Demonstrate mastery of the aircraft at minimum controllable airspeed.

- AFH 4: Maintaining Aircraft Control

Instructor comments: _____

Lab 3: Precision Flight

Practice changes to heading, altitude, and airspeed. Master simultaneous changes with instructions from Air Traffic Control.

- AFH 1: Introduction to Flight Training

Instructor comments: _____

Lab 4: Ground operations

Learn how to use checklists during ground operations (startup, run-up, before takeoff, after landing). Master taxiing while interpreting the airport environment. Learn how to tune the radio. Talk to Ground Control using standard phraseology.

- AFH 2: Ground Operations
- PHAK 14: Airport Operations
- AIM 2: Aeronautical Lighting and Other Airport Visual Aids
- AIM 4.2: Radio Communications Phraseology and Techniques
    - AIM 4.2.7: Phonetic Alphabet

Instructor comments: _____

Lab 5: Landings

Learn why landing an airplane is easy, but setting up a good landing is hard. Intercept the extended centerline and know what three problems must be solved before touchdown.

- AFH 8: Approaches and Landings

Instructor comments: _____

Lab 6: Traffic Patterns 1: Non-Towered, Single-Runway Airports

Learn the fundamentals of navigating an airport traffic pattern. Transmit position reports on the Common Traffic Advisory Frequency (CTAF) using standard phraseology. Prepare to execute emergency go-arounds. Combine your current skills (four fundamentals, slow flight, precision flight, ground operations, landings) to fly traffic patterns with confidence.

- AFH 7: Airport Traffic Patterns
- PHAK 14: Airport Operations

Instructor comments: _____

Lab 7: Traffic Patterns 3: Wind Correction Angles

Improve your traffic pattern skills by flying rectangular courses while factoring for wind. The weather is calm, but a cold front is approaching your airport. Use wind-correction angles to maintain the correct ground-track. Practice your crosswind landing techniques as the winds increase.

• AFH 6: Ground Reference Maneuvers

Instructor comments: _____

Lab 8: Traffic Patterns 2: Towered Fields with Multiple Runways

Increase your situational awareness by flying traffic patterns at a multi-runway airport. Communicate with Ground Control and Tower to obtain clearances. Make left-hand and right-hand traffic. Consult an airport diagram and navigate a complex ground environment when assigned different runways.

Instructor comments: _____

Lab 9: Traffic Patterns 4: Departures & Arrivals

Master a high-workload environment by flying a single-pilot operation between two airports over a distance of about 40 miles. Plan a route, get weather, set radio frequencies, obtain clearances, use your pilotage skills, depart and enter traffic patterns, and taxi for shutdown.

• PHAK 15: Airspace, ACUG 1.1, 1.2
• Seattle Sectional & NW Chart Supplement

Instructor comments: _____

Lab 10: Ground Reference Maneuvers

Fly the required ground reference maneuvers using a variety of land and water features. Master turns around a point, S-turns across a road, and the rectangular course.

• AFH 6: Ground Reference Maneuvers

Instructor comments: _____

Lab 11: Emergencies

Experience the types of emergencies you are unlikely to face during your flying career — but still should prepare for. Attempt "the impossible turn" on departure. Declare "Mayday" and make emergency landings from the crosswind and downwind legs. Plan a long-distance glide to safety. Perform an emergency descent. Get a landing clearance with signal lights.

- AFH: Chapter 10: Performance Maneuvers
- AFH: Chapter 16: Emergency Procedures

Instructor comments: _____

Lab 12: VOR navigation

Unlock the VHF Omni-Directional Range (VOR) navigation system, which is widely available and a key component of cross-country flight. Learn how to "talk" to the station, and how the station replies. Avoid reverse sensing. Intercept a radial and fly directly to the station. Cross the "cone of confusion." Fly within a few miles of a VOR station and intercept another radial to continue your journey.

- PHAK 16: Navigation

Instructor comments: _____

Lab 13: VFR Navigation and Cross-Country Flight

Plan a VFR cross-country flight and fly over the horizon to an airport more than 50 nautical miles away. Use pilotage, dead reckoning, VOR navigation, and a flight log to stay on track. Practice diverting to an alternate airport in case of an emergency.

- PHAK 10: Weight & Balance Computations
- PHAK 16: Navigation
- Weight & Balance Handbook
- Risk Management Handbook
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Instructor comments: _____

Lab 14: IMC Demonstration

The IMC Demonstration is a key component of the Private Pilot checkride. Hold the aircraft straight and level using the flight instruments instead of the horizon. Execute a level 180-degree turn to get yourself out of the clouds. Fly direct to a VOR station. Fly an IMC approach to an airport with vectors from ATC.

Instructor comments: _____

Additional labs

- Traffic Patterns 4: Density Altitude Operations (Telluride, Co.)
- Traffic Patterns 5: Carrier Operations (USS Nimitz)
- Traffic Patterns 6: First Solo
- VFR Arrival and Departure: Boeing Field
- Emergencies 2: Aurora to Sunriver cross-country
- Night Operations and Night cross-country
- Advanced Maneuvers (Commercial Pilot ACS)
- Flight Challenge: F4 Phantom: Boeing Field to PDX

About Flight Lab

Lab time is not "flight training," but instead ground instruction with an FAA-certified instructor. The flight simulator is used to explore and clarify concepts set out in the Airplane Flying Handbook and other FAA texts.

Flight Lab sessions are two hours in length, with a 30-minute briefing and 90 minutes of simulator flying. Traffic pattern and inter-airport labs can extend to three hours.

Lab time does not contribute to the 40 logged hours required for a Private Pilot checkride. Students can log up to 2.5 hours in the Redbird FMX toward the total hours required for a checkride. (Please note that most pilots log 60-90 hours before advancing to the flight test.)

- AFH: Airplane Flying Handbook
- PHAK: Pilot's Handbook of Aeronautical Knowledge
- AIM: Aeronautical Information Manual
- ACUG: Aeronautical Chart User's Guide
- RMH: Risk Management Handbook
- WBH: Weight & Balance Handbook
- ACS: Airman Certification Standards