



Rich Bates – Flight Instructor



Flight Lessons to Accompany the Gold Seal Online Ground School

This is your training course outline, or flight syllabus , to accompany the Gold Seal Online Ground School. Lessons are arranged in six sections to match the layout of the ground school. The flight lessons have reading material from the FAA Airplane Flying Handbook (AFH), much of which is not included in the Gold Seal course. The AFH is available as a [free download](http://www.faa.gov) from the faa.gov website. Occasionally, it is better to do a few of the Gold Seal lessons out of order. You will find notes when that is the case.



You will find descriptions of each flight lesson under the “Flight Lessons” banner.



The reading material associated with the lesson will be listed to the right of the lesson description.



Any notes about the Gold Seal lessons appear under their logo.

Section 1 Getting Started



Your First Flying Lesson

Objective: In this lesson you will learn how to use a checklist to inspect and start your airplane. You will also learn how to taxi using the rudder pedals, throttle, and brakes to turn, control the speed of your airplane, and stop. In the air you'll learn how to use the controls to make your airplane climb, descend, turn, and fly straight and level. After the flight is over, you'll learn how to shut down the systems and engine, move your airplane, and secure it.

Learning to Control the Airplane

Objective: During this lesson(s) you'll be introduced to basic pitch, roll, and yaw aerodynamics. You'll learn when to expect your airplane's left turning tendencies and how to control them. You'll also learn the key to controlling your speed while in climbs and descents. You'll learn that using flaps can give you an added advantage for slowing and descents. You'll also learn the relationship pitch has with bank, and the relationship bank has with yaw. You'll learn how to coordinate the ailerons (roll), elevator (pitch), rudder (yaw), and throttle (power) to properly fly the airplane.

Flying the Airplane and Landing (with help)

Objective: In this lesson you'll build on what you've already done with the four fundamentals of straight and level flight, turns, climbs, and descents, while combining climbing and descending with turning. You'll be introduced to the landing approach and the go-around maneuver (rejected landing), while getting tips that will help you recognize when you're airplane is flying slowly. With your instructor's assistance you'll be able to control the airplane from takeoff to landing making smooth and coordinated maneuvers using outside visual references.

Chapter 1—Introduction to Flight Training	
Flight Safety Practices.....	1-4
Collision Avoidance.....	1-4
Runway Incursion Avoidance.....	1-5
Stall Awareness.....	1-6
Use of Checklists.....	1-6
Positive Transfer of Controls.....	1-6
Chapter 2—Ground Operations	
Visual Inspection.....	2-1
Inside the Cockpit.....	2-2
Outer Wing Surfaces and Tail Section.....	2-4
Fuel and Oil.....	2-5
Landing Gear, Tires, and Brakes.....	2-6
Engine and Propeller.....	2-6
Cockpit Management.....	2-7
Ground Operations.....	2-7
Engine Starting.....	2-7
Hand Propping.....	2-8
Taxiing.....	2-9
Before Takeoff Check.....	2-11
After Landing.....	2-11
Clear of Runway.....	2-11
Parking.....	2-11
Engine Shutdown.....	2-12
Postflight.....	2-12
Securing and Servicing.....	2-12

Chapter 3—Basic Flight Maneuvers

The Four Fundamentals.....	3-1
Effects and Use of the Controls.....	3-1
Feel of the Airplane.....	3-2
Attitude Flying.....	3-2
Integrated Flight Instruction.....	3-3
Straight-and-Level Flight.....	3-4
Trim Control.....	3-6
Level Turns.....	3-7
Climbs and Climbing Turns.....	3-13
Normal Climb.....	3-13
Best Rate of Climb.....	3-13
Best Angle of Climb.....	3-13
Descents and Descending Turns.....	3-15
Partial Power Descent.....	3-16
Descent at Minimum Safe Airspeed.....	3-16
Glides.....	3-16
Pitch and Power.....	3-19

Chapter 4—Slow Flight, Stalls, and Spins

Introduction.....	4-1
Slow Flight.....	4-1
Flight at Less than Cruise Airspeeds.....	4-1
Flight at Minimum Controllable Airspeed.....	4-1

Chapter 5—Takeoff and Departure Climbs

General.....	5-1
Terms and Definitions.....	5-1
Prior to Takeoff.....	5-2
Normal Takeoff.....	5-2
Takeoff Roll.....	5-2
Lift-Off.....	5-3
Initial Climb.....	5-4

Chapter 8—Approaches and Landings

Normal Approach and Landing.....	8-1
Base Leg.....	8-1
Final Approach.....	8-2
Use of Flaps.....	8-3
Estimating Height and Movement.....	8-4
Roundout (Flare).....	8-5
Touchdown.....	8-6
After-Landing Roll.....	8-7
Stabilized Approach Concept.....	8-7

Lesson 5 “Engines and Systems” from Section 3 should be done while in Section 1.

In this Section, Lesson 6 “Conventional Airplane Instruments” can be delayed until Section 3.

Section 2 Your First Few Hours



Airports, Radios, and Wind

Objective: From this lesson forward you will take more responsibility for radio communications, following taxi instructions, and safe airport operations. In this lesson you will learn how to control your airplane's track over the ground, by correcting for the wind, so you can fly straight to where you want to go. You will learn more about the traffic pattern at the airport and more about the approach to landing.

Flying Even Slower, Almost Stalling, and More Go-Arounds

Objective: In this lesson you'll learn airspeed and altitude control while flying the airplane very slowly. You will learn how to properly coordinate the controls while coming near to an aerodynamic stall and then recovering. You'll practice more go-around maneuvers and will watch a demonstration of what not to do during a go-around procedure. You will also get more practice in the traffic pattern with some landings.

Sneaky Stalls, and the No-Spin Zone

Objective: During this flight you will develop your best defense against being mugged by one of those sneaky stalls: learning how they look, sound, and feel and then controlling the airplane back to normal flight. You will be provided a demonstration of an improper stall recovery which we call a secondary stall. You will practice spin prevention and learn about spin recovery, although you won't actually perform a spin (you're welcome).

Steeper Turns, Faster Stalls, and Crossing the Controls

Objective: You'll learn the performance maneuver that taxes your ability to coordinate pitch, roll, and yaw while dividing your attention inside and (mostly) outside the plane. You will be given a demonstration of how a plane can stall at a higher airspeed than you might think, as well as a demonstration of an imminent cross-controlled stall.

Chapter 6—Ground Reference Maneuvers		
Purpose and Scope.....	6-1	
Maneuvering By Reference to Ground Objects		6-1
Drift and Ground Track Control.....	6-2	
Rectangular Course	6-4	
Chapter 7—Airport Traffic Patterns		
Airport Traffic Patterns and Operations	7-1	
Standard Airport Traffic Patterns	7-1	
Chapter 8—Approaches and Landings		
Go-Arounds (Rejected Landings).....	8-11	
Power	8-11	
Attitude	8-12	
Configuration.....	8-12	

Chapter 4—Slow Flight, Stalls, and Spins	
Stalls	4-3
Recognition of Stalls	4-3
Fundamentals of Stall Recovery	4-4
Use of Ailerons/Rudder in Stall Recovery	4-5
Stall Characteristics	4-6
Approaches to Stalls (Imminent Stalls) —Power-On or Power-Off	4-6

Chapter 4—Slow Flight, Stalls, and Spins	
Full Stalls Power-Off.....	4-7
Full Stalls Power-On	4-8
Spins	4-12
Spin Procedures.....	4-13
Entry Phase	4-13
Incipient Phase.....	4-13
Developed Phase	4-14
Recovery Phase	4-14
Intentional Spins.....	4-15
Weight and Balance Requirements.....	4-16

Chapter 9—Performance Maneuvers	
Performance Maneuvers	9-1
Steep Turns	9-1
Chapter 4—Slow Flight, Stalls, and Spins	
Secondary Stall.....	4-9
Accelerated Stalls	4-9
Cross-Control Stall	4-10
Elevator Trim Stall	4-11

Your first solo won't come until Section 3.

Section 3 Skill Building



Low Level Circles, Semi-Circles, Losing Altitude the Fun Way

Objective: You will learn about having an engine fire in flight, how to perform a maneuver called an emergency descent (it's fun when it's not for real), and how to glide the plane. Once you're lower to the ground you'll learn how to fly a curved track across the ground in the wind.

What to Do When a Noisy Airplane Becomes Quiet (and What Not to Do)

Objective: During this flight you will learn how to deal with an engine failure. You'll learn how to prioritize, memorize the emergency procedures, and make a simulated emergency approach to an off-airport landing. You'll be introduced to a tool you may use in a landing, a maneuver called the forward slip. We'll simulate an engine failure after takeoff and show why you do not want to try the infamous "impossible turn". You'll finish off this crazy flight with a real power-off landing! (on the runway)

Handling the Unexpected

Objective: In this lesson(s) you'll learn how to handle unexpected events like an open door or blown tire on takeoff, poor performance on takeoff, partial power failure in flight, radio failure, wake turbulence avoidance, making a "short approach", and landing with failed instruments or flaps.

Getting Ready to Solo

Objective: During this flight(s) your instructor will review all the elements you have learned up to this point and help you polish the skills you need to fly by yourself. We'll also review your pre-solo exam.

** You may have noticed that there is no specific mention of cross-wind landings up to this point. Since wind cannot be cued up on demand, we'll just have to take crosswind landings where we find them.*

Solo Flight

Objective: Practice the maneuvers you have learned while measuring them against the PTS. Fly in the traffic pattern and practice landings.

Chapter 6—Ground Reference Maneuvers

S-Turns Across a Road	6-6
Turns Around a Point	6-7

Chapter 16—Emergency Procedures

Emergency Situations	16-1
Emergency Landings	16-1
Types of Emergency Landings	16-1
Psychological Hazards	16-1
Basic Safety Concepts	16-2
Emergency Descents	16-6
In-Flight Fire	16-7
Engine Fire	16-7
Electrical Fires	16-7
Cabin Fire	16-8

Chapter 16—Emergency Procedures

General	16-2
Attitude and Sink Rate Control	16-3
Terrain Selection	16-3
Airplane Configuration	16-3
Approach	16-4
Terrain Types	16-4
Confined Areas	16-4
Trees (Forest)	16-4
Water (Ditching) and Snow	16-4
Engine Failure After Takeoff (Single-Engine)	16-5
Chapter 8—Approaches and Landings	
Intentional Slips	8-10
Emergency Approaches and Landings (Simulated)	8-25

Chapter 16—Emergency Procedures

Flight Control Malfunction / Failure	16-8
Total Flap Failure	16-8
Asymmetric (Split) Flap	16-8
Loss of Elevator Control	16-9
Landing Gear Malfunction	16-9
Systems Malfunctions	16-10
Electrical System	16-10
Pitot-Static System	16-11
Abnormal Engine	
Instrument Indications	16-11
Door Opening In Flight	16-12

Chapter 5—Takeoff and Departure Climbs

Crosswind Takeoff	5-5
Takeoff Roll	5-5
Lift-Off	5-6
Initial Climb	5-6
Ground Effect on Takeoff	5-7

Chapter 8—Approaches and Landings

Ground Effect	8-13
Crosswind Approach and Landing	8-13
Crosswind Final Approach	8-13
Crosswind Roundout (Flare)	8-15
Crosswind Touchdown	8-15
Crosswind After-Landing Roll	8-15
Maximum Safe	
Crosswind Velocities	8-16
Turbulent Air Approach and Landing	8-17

Look at the first lesson in Section 5, "In the Class D Traffic Pattern".

Section 4 Aviation Weather



Solo Flight (Continued)

Objective: Practice the maneuvers you have learned while measuring them against the PTS. Fly in the traffic pattern and practice landings.

**You will continue to fly solo in between the following lessons in this section and the next two sections.*

Specialized Takeoffs and Landings

Objective: In this lesson you will be introduced to two new variations of the takeoff and landing. You'll learn the short field takeoff and landing, and the soft field takeoff and landing. You can then add these to your solo practice.

VOR Introduction

Objective: In this lesson you will be introduced to the radio navigation aid known as the VOR. Using the local VOR you will learn to orient your position relative to the station (VOR), track to and from the station, and intercept a radial (course).

Instrument Introduction

Objective: In this lesson you will be introduced to flight solely by reference to instruments, and learn what to do if you inadvertently fly into conditions where you cannot see. You will learn how to fly straight and level, turn, climb and descend using only the flight instruments. You will also learn how to get help from Air Traffic Control (ATC).

Introduction to Night Flying

Objective: In this lesson you will be introduced to flying at night in the local area, and make some of your first night landings.

Chapter 8—Approaches and Landings

Faulty Approaches and Landings	8-27
Low Final Approach	8-27
High Final Approach	8-27
Slow Final Approach	8-28
Use of Power	8-28
High Roundout	8-28
Late or Rapid Roundout	8-29
Floating During Roundout.....	8-29
Ballooning During Roundout	8-30
Bouncing During Touchdown	8-30
Porpoising	8-31
Wheelbarrowing	8-32
Hard Landing	8-32
Touchdown in a Drift or Crab	8-32
Ground Loop	8-33
Wing Rising After Touchdown.....	8-33

Chapter 5—Takeoff and Departure Climbs

Short-Field Takeoff and Maximum Performance Climb.....	5-8
Takeoff Roll	5-9
Lift-Off	5-9
Initial Climb.....	5-9
Soft/Rough-Field Takeoff and Climb.....	5-10
Takeoff Roll	5-10
Lift-Off	5-10
Initial Climb.....	5-10

Chapter 8—Approaches and Landings

Short-Field Approach and Landing	8-17
Soft-Field Approach and Landing	8-19

Chapter 16—Emergency Procedures

Inadvertent VFR Flight Into IMC	16-12
General.....	16-12
Recognition.....	16-14
Maintaining Airplane Control	16-14
Attitude Control.....	16-14
Turns	16-15
Climbs.....	16-15
Descents.....	16-16
Combined Maneuvers.....	16-16
Transition to Visual Flight.....	16-16

Chapter 10—Night Operations

Night Vision.....	10-1
Night Illusions	10-2
Pilot Equipment	10-3
Airplane Equipment and Lighting	10-3
Airport and Navigation Lighting Aids	10-4
Preparation and Preflight.....	10-4
Starting, Taxiing, and Runup.....	10-5
Takeoff and Climb	10-5
Orientation and Navigation	10-6
Approaches and Landings	10-6
Night Emergencies	10-8

See Section 5, Lesson 3 "VOR Navigation".

Section 5 Real World Flying



Simple Cross-Country Flight

Objective: In this flight you will get to use your newly acquired VOR navigation skills to fly to another airport. You'll also calculate weight and balance, and takeoff and landing distances. We'll check online weather forecasts and NOTAM's, and use the ATC service known as "flight following". If practical, we can fly at night to an airport at least 50nm away. If not, we'll get the night cross-country flight done later. If practical we will work in some instrument flight.

Flight Planning the Old-Fashioned Way

Objective: This lesson will be spent entirely on the ground working through the steps of figuring out a course, distance, time, and fuel burn using paper charts, a plotter, and a retro flight computer. Although I expect you'll use electronic means of flight planning once you get your certificate, it is important to know what goes into the calculations and planning. This will provide you with situational awareness when the batteries die.

A Less Simple Cross-Country Flight(s)

Objective: In this flight(s) you will put to use your newly acquired pilotage and 'ded' reckoning skills. We'll go over your flight plan, get a briefing from an FSS specialist, and file a flight plan with FSS. You can also choose to receive flight following. You will then conduct the flight as planned. We'll see how your time and fuel calculations worked out at the end of the flight. If practical we will work in some instrument flight practice.

Cross-Country Diversion

Objective: In this flight(s) you will plan to fly to some destination airport, but unfortunately, you will not be able to complete the flight as planned. A simulated mechanical or weather problem will arise forcing you to alter your plan and divert to another airport. If practical we will work in some instrument flight practice.

Pre-Solo Cross-Country Review

Objective: In this lesson we will review various emergency procedures in preparation for solo cross-country flight. These may include engine failure, engine fire, electrical fire, low oil pressure or partial power loss, inadvertent flight into instrument meteorological conditions, lost communications, and lost procedures.

Section 6 Test Prep – Your Final Step



First Solo Cross-Country

Objective: You will plan and conduct a flight to an airport you have previously been to that is more than 50nm away.

Next Solo Cross-Country(s)

Objective: You will plan and conduct a flight(s) to an airport of your choice that is more than 50nm away.

Long Solo Cross-Country

Objective: You will plan and conduct a flight that meets the requirements of 61.109(a)(5)(ii).

Checkride Preparation

Objective: In this lesson(s) you will spend time on the ground and in the air making final preparations for the private pilot checkride. You will plan a flight based on a given scenario. This will serve as a means for reviewing much of the material in the Practical Test Standards (PTS). You will be quizzed on the elements of the PTS and will perform all the flight elements to better than PTS standards. The application for the test will be completed as well as the necessary endorsements in your logbook.