



Pilot Career Solutions

Private Pilot Syllabus

Airplane Single-Engine Land · Part 61 · built on the FAA Airman Certification Standards

Edition 1.3 · September 2026

Safety first. Aeronautical decision-making before the airplane. Read, rehearse, then fly. Do it right the first time, because that is the safest way to fly and the cheapest way to train.

Free FAA references only: Airman Certification Standards, Pilot's Handbook of Aeronautical Knowledge, Airplane Flying Handbook, AIM, 14 CFR, Risk Management Handbook, Aviation Weather Handbook.

This book is free.

Scan for your own copy, the fillable workbook, and the guide.

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Our promise

Pilot Career Solutions is written by an active legacy-airline captain who learned to fly the way this syllabus teaches: from a father who taught him the foundations and principles of flight in a Piper Archer, one careful step at a time. Everything on our site is free, and every number in it is meant to be honest. This syllabus is the same idea applied to training itself.

Our mission is simple. We want you to become a pilot who does things the right way the first time, because that is the safest way to fly and, not by coincidence, the cheapest way to train.

What we care about: safety, decision-making, and not rushing

Slow is smooth and smooth is fast. Most of the money wasted in flight training is spent re-learning things that were rushed the first time: a checklist skipped, a chapter not read, a radio call improvised, a maneuver flown before the student understood what it was for. Every one of those costs another expensive hour in the airplane to fix.

So this syllabus starts where the FAA starts, not with the airplane but with aeronautical decision-making (ADM) and risk management. You will learn the PAVE checklist, the IMSAFE personal checklist, and the 3P model before you learn to trim, and you will use them before every flight for the rest of your career. The Airman Certification Standards test them on every single task.

Checklists are read, not recited from memory, and they are read out loud. You will preflight the same way every time. You will brief every takeoff. You will call every go-around early rather than late. None of this is dramatic; it is just professional.

Read first, then rehearse, then fly. Each lesson in this syllabus tells you exactly which pages of which free FAA book to read and which simulator profile to fly before you arrive. When you show up already knowing what the lesson is and what the standards are, the airplane time is spent flying. No guesswork. No wondering what we will be doing today.



What is required of me?

Everything below comes from Title 14 of the Code of Federal Regulations (the FARs), Part 61. Read the actual regulation at ecfr.gov; the citations are given so you can. Numbers here are the Part 61 minimums; the national average to finish is roughly 60-75 hours, and that is not a failure. It is normal.

Eligibility (61.103)

- Be at least 17 years old (16 to solo as a student pilot, 61.83).
- Read, speak, write, and understand English.
- Hold at least a third-class medical certificate (Part 67) issued by an Aviation Medical Examiner, or qualify under BasicMed (Part 68) after first holding a medical. Get the medical before you spend real money on training.
- Hold a student pilot certificate before solo (apply free through IACRA; the FAA issues the plastic card).
- Receive the required ground and flight training and the logbook endorsements from an authorized instructor.
- Pass the FAA knowledge test (the written) and the practical test (the checkride: oral exam plus flight).

Aeronautical knowledge - the written (61.105)

- Regulations relevant to private pilot privileges, limitations, and flight operations.
- Accident reporting requirements of the National Transportation Safety Board (49 CFR Part 830).
- Use of the Aeronautical Information Manual and FAA advisory circulars.
- Use of aeronautical charts for VFR navigation using pilotage, dead reckoning, and navigation systems.
- Radio communication procedures.
- Recognition of critical weather situations from the ground and in flight, windshear avoidance, and the use of aeronautical weather reports and forecasts.
- Safe and efficient operation of aircraft, including collision avoidance and recognition and avoidance of wake turbulence.
- Effects of density altitude on takeoff and climb performance.
- Weight and balance computations.
- Principles of aerodynamics, powerplants, and aircraft systems.
- Stall awareness, spin entry, spins, and spin recovery techniques.
- Aeronautical decision making and judgment.
- Preflight action: how to obtain weather reports and forecasts, runway lengths, and alternates; and how to compute fuel requirements and takeoff and landing distances.



Flight proficiency - the Areas of Operation (61.107)

- Preflight preparation. Preflight procedures. Airport and seaplane base operations. Takeoffs, landings, and go-arounds. Performance maneuvers. Ground reference maneuvers. Navigation. Slow flight and stalls. Basic instrument maneuvers. Emergency operations. Night operations. Postflight procedures.
- These twelve areas are exactly the Areas of Operation in the Private Pilot Airman Certification Standards. The ACS is the regulation turned into a test plan, which is why this syllabus is organized around it.

Aeronautical experience - the hours (61.109(a))

- 40 hours of flight time total, including at least 20 hours of flight training from an authorized instructor and 10 hours of solo flight training in the areas of operation listed in 61.107(b)(1).
- 3 hours of cross-country flight training in a single-engine airplane.
- 3 hours of night flight training in a single-engine airplane that includes one cross-country flight of over 100 nautical miles total distance and 10 takeoffs and 10 landings to a full stop (each involving a flight in the traffic pattern) at an airport.
- 3 hours of flight training in a single-engine airplane on the control and maneuvering of an airplane solely by reference to instruments, including straight and level flight, constant airspeed climbs and descents, turns to a heading, recovery from unusual flight attitudes, radio communications, and the use of navigation systems/facilities and radar services appropriate to instrument flight.
- 3 hours of flight training with an authorized instructor in a single-engine airplane in preparation for the practical test, within the preceding 2 calendar months from the month of the test.
- 10 hours of solo flight time in a single-engine airplane, consisting of at least: 5 hours of solo cross-country time; one solo cross-country flight of 150 nautical miles total distance, with full-stop landings at three points, and one segment of the flight consisting of a straight-line distance of more than 50 nautical miles between the takeoff and landing locations; and three takeoffs and three landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport with an operating control tower.

Before you can solo (61.87)

- Pass a pre-solo knowledge test given by your instructor, covering Parts 61 and 91, airspace rules and procedures for the airport where the solo flight will be performed, and the flight characteristics and operational limitations of the make and model you will fly (61.87(b)).
- Receive and log flight training in the pre-solo maneuvers and procedures of 61.87(d), and be found proficient and safe.
- Hold the endorsements of 61.87(n) (90-day solo endorsement) and, for cross-country solos, the endorsements of 61.93. The standard endorsement wording is in Advisory Circular 61-65.

Part 61 or Part 141?

- This syllabus is written for Part 61 training (the flexible, instructor-led path most people use). Part 141 schools use an FAA-approved curriculum with slightly lower minimum hours (35) and stage checks. The knowledge you need and the checkride you take are identical. Everything here applies to both; a 141 student simply follows the school's approved lesson order and uses this as the study companion.



PART 3 • SOURCES

The free library: every book you need, and where to get it

Every document below is published by the FAA and is free. You never need to buy a study guide to learn this material; you need to read the sources the examiner reads.

Code	Document	Use it for
FAA-S-ACS-6C	<u>Private Pilot for Airplane Category - Airman Certification Standards</u> 2024 www.faa.gov/training_testing/testing/acs/private_airplane_acs_6.pdf	The test plan. Every task your examiner can ask, with the references for each one. Read it first and keep it open all year.
FAA-H-8083-25C	<u>Pilot's Handbook of Aeronautical Knowledge (PHAK)</u> 2023 · 17 chapters www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak	The ground-school textbook: aerodynamics, systems, instruments, weight and balance, performance, weather, airports, airspace, navigation, aeromedical factors, and aeronautical decision-making. Download the whole book or one chapter at a time.
FAA-H-8083-3C	<u>Airplane Flying Handbook (AFH)</u> 2021 · 18 chapters www.faa.gov/regulations_policies/handbooks_manuals/aviation/airplane_handbook	How to actually fly the maneuvers: takeoffs, landings, stalls, ground reference, emergencies, night. The flight-lesson textbook.
AIM	<u>Aeronautical Information Manual</u> updated twice a year www.faa.gov/air_traffic/publications/atpubs/aim.html	Airspace, ATC procedures, radio phraseology, airport lighting and markings, emergencies, weather hazards, the Pilot/Controller Glossary. Read online; cited as chapter-section-paragraph, e.g. AIM 4-3-3.
14 CFR Parts 61 and 91	<u>Federal Aviation Regulations (the FARs) on eCFR</u> always current www.ecfr.gov/current/title-14	Part 61 = certification of pilots (what you must do). Part 91 = general operating and flight rules (how you must fly). Also Part 67 (medical), Part 68 (BasicMed), and NTSB Part 830 (accident reporting).
FAA-H-8083-2A	<u>Risk Management Handbook</u> 2022 www.faa.gov/regulations_policies/handbooks_manuals/aviation/risk_management_handbook	The book behind every 'Risk Management' element in the ACS: PAVE, IMSAFE, the 3P model, hazards vs. risks, single-pilot resource management.
FAA-H-8083-28B	<u>Aviation Weather Handbook</u> 2022 (rev. B current) www.faa.gov/regulations_policies/handbooks_manuals/aviation/	Consolidates the old weather advisory circulars (AC 00-6 Aviation Weather and AC 00-45 Aviation Weather Services) into one book: weather theory, hazards, and every product you will read in a briefing. Listed on the FAA handbooks index page.
FAA-H-8083-1B	<u>Aircraft Weight and Balance Handbook</u> 2016 www.faa.gov/regulations_policies/handbooks_manuals/aviation/weight_balance_handbook	Deeper than the PHAK chapter when you want to understand the math behind the CG envelope.



Code	Document	Use it for
FAA-H-8083-15B	<u>Instrument Flying Handbook</u> 2012 www.faa.gov/regulations_policies/handbooks_manuals/aviation/instrument_flying_handbook	Only Chapters 3 to 5 (instruments, attitude flying) are needed for the Private certificate's 3 hours of instrument training.
ACS Companion Guide	<u>Airman Certification Standards Companion Guide for Pilots</u> current www.faa.gov/sites/faa.gov/files/training_testing/testing/acs/acs_companion_guide_pilots.pdf	Explains how the ACS codes work, how the oral and flight portions are conducted, and how the examiner grades.
AC 61-65K	<u>Advisory Circular 61-65 - Certification: Pilots and Flight and Ground Instructors</u> rev. K · November 14, 2025 www.faa.gov/documentlibrary/media/advisory_circular/ac_61-65K.pdf	The exact wording of every logbook endorsement you will need (solo, cross-country, knowledge test, practical test).
AC 61-67	<u>Advisory Circular 61-67 - Stall and Spin Awareness Training</u> rev. C www.faa.gov/documentLibrary/media/Advisory_Circular/AC_61-67C_Chg_1.pdf	Referenced by the ACS for the spin awareness task.
Charts and Chart Supplement	<u>FAA Aeronautical Charts, Chart Supplement, and Chart User's Guide (digital products)</u> 56-day cycle www.faa.gov/air_traffic/flight_info/aeronav/digital_products/	Free sectional charts (PDF and GeoTIFF), the Chart Supplement (airport data), airport diagrams, and the Chart User's Guide that decodes every chart symbol.
Airport diagrams	<u>FAA Airport Diagrams</u> current www.faa.gov/airports/runway_safety/diagrams/	Print your home airport's diagram and use it for every simulator session and every real taxi.
Advisory Circulars	<u>FAA Advisory Circular library</u> search by number www.faa.gov/regulations_policies/advisory_circulars/	AC 90-66 (non-towered airport operations), AC 68-1 (BasicMed), AC 91-73 (single-pilot taxi procedures) and every other AC the ACS cites.
C172S POH	<u>Pilot's Operating Handbook / FAA-Approved Airplane Flight Manual for the airplane you train in</u> your tail number Provided by your flight school	Not an FAA publication and not free online in an official form; your school provides it. Sections you will live in: 2 Limitations, 3 Emergency Procedures, 4 Normal Procedures, 5 Performance, 6 Weight and Balance, 7 Systems.



Decoding FAA document numbers

FAA publications look cryptic until you learn the pattern. Every code tells you the type of document and which one it is.

You see	It means	Examples
FAA-H-8083-xx	H = Handbook. The number after 8083 identifies the book; a trailing letter is the edition (25C is the third revision of book 25).	8083-25 PHAK · 8083-3 Airplane Flying Handbook · 8083-2 Risk Management · 8083-28 Aviation Weather · 8083-1 Weight and Balance · 8083-15 Instrument Flying · 8083-16 Instrument Procedures · 8083-9 Aviation Instructor's Handbook · 8083-27 Student Pilot Guide
FAA-S-ACS-x	S = Standard. ACS = Airman Certification Standards, the document your checkride is graded against.	ACS-6 Private Pilot Airplane · ACS-7 Commercial Airplane · ACS-8 Instrument Rating Airplane · ACS-11 Airline Transport Pilot · ACS-25 Flight Instructor Airplane
AC xx-yy	Advisory Circular. The first number is the subject series (61 = pilot certification, 90 = air traffic/general operations, 00 = general), the second is the circular; a letter is the revision.	AC 61-65K endorsements · AC 61-67 stall and spin · AC 90-66 non-towered airport operations · AC 91-73 single-pilot taxi · AC 68-1 BasicMed · AC 00-6 and 00-45 (weather, now folded into 8083-28)
14 CFR 61.109(a)(2)	Title 14 of the Code of Federal Regulations, Part 61, section 109, paragraph (a), subparagraph (2). Read it as: the FAR book, the chapter, the rule, the sub-rule.	Part 61 pilots · Part 91 flight rules · Part 67 medical · Part 68 BasicMed · Part 71/73 airspace · Part 43 maintenance · 49 CFR 830 NTSB reporting
AIM 4-3-3	Aeronautical Information Manual, Chapter 4, Section 3, Paragraph 3 (Traffic Patterns). Same pattern everywhere in the AIM.	Ch 1 navigation aids · Ch 2 lighting and airport visual aids · Ch 3 airspace · Ch 4 ATC · Ch 5 ATC procedures · Ch 6 emergencies · Ch 7 safety of flight (weather, hazards) · Ch 8 medical facts · Ch 9 charts
PA.IV.B.K3	An ACS code. PA = Private Airplane. IV = Area of Operation 4 (Takeoffs, Landings, and Go-Arounds). B = Task B (Normal Approach and Landing). K3 = Knowledge element 3. R = Risk Management element, S = Skill element.	Knowledge elements are asked in the oral. Skill elements are flown. Risk Management elements are asked in both; the examiner wants to hear you think.
PHAK 8-14	FAA handbooks number pages by chapter: chapter 8, page 14. The printed book and the free PDF use the same chapter-page numbers, so a reference works for both.	This syllabus cites chapter and section title. Open the chapter PDF, search the section title (Ctrl+F / Cmd+F), and you are there in seconds.

How to use the ACS to find what to study

- 1 Open the Private Pilot ACS and find the task for what you are learning; for landings it is Area IV, Task B, Normal Approach and Landing.
- 2 The task table starts with a References line. For IV.B it lists FAA-H-8083-2 (Risk Management), FAA-H-8083-3 (Airplane Flying Handbook), FAA-H-8083-23 (seaplanes, ignore), the POH/AFM, and the AIM. Those are the only books the examiner can draw that task from.

- 3 Match each reference to the chapter that covers the task: AFH Chapter 9 (Approaches and Landings), AIM Chapter 4 Section 3 (airport operations), POH Section 4 (normal procedures). The Study Locator on page 79 lists every chapter of every book so you can do this for any task.
- 4 Read the Knowledge (K) elements and study those topics until you can explain them out loud. Read the Risk Management (R) elements and decide, in advance, what you would do about each. Read the Skill (S) elements: those are the numbers you will be held to in the airplane.
- 5 Every lesson in this syllabus has already done steps 1-4 for you. The point of showing you the method is that you will use it for every rating you ever earn.





How the checkride works: one test, two parts

The practical test is given by a Designated Pilot Examiner (DPE) after your instructor endorses you. It has two parts on the same day.

The oral exam comes first, usually 1.5 to 3 hours at a table. The examiner works through the Knowledge and Risk Management elements of the ACS: your certificate and medical, the airplane's airworthiness and documents, the weather for a cross-country you planned that morning, airspace along the route, performance and weight and balance, systems, aeromedical factors. You may use your books, your notes, and your planning; you may not stall for time. The examiner is checking that you understand, not that you memorized.

The flight portion is the Skill elements: the cross-country departure and a diversion, maneuvers to the tolerances printed in the ACS, emergencies, instrument work under the hood, and a series of takeoffs and landings. Each task is a pass or fail on its own; one failed task ends the ride as a notice of disapproval, and you retest only the failed items after more training.

Two facts that calm most people down: the DPE must use the ACS, so nothing is a surprise; and the tolerances (altitude plus or minus 100 feet, airspeed plus 10 minus 5 knots, headings plus or minus 10 degrees) are generous once you have been trained to them from day one, which is what this syllabus does.

How this syllabus works and how to read it

Three columns, always in the same order.

Every lesson lists (1) what is required - the ACS tasks and FAR items it covers, (2) what to study before you arrive - the exact FAA book, chapter, and section, and (3) what we will do - the simulator profile to fly at home, then the flight or ground session itself, with completion standards.

Read, then rehearse, then fly.

The rule of this program: you do not arrive at a lesson without having read the study assignment and flown the simulator profile. If life got in the way, tell your instructor and reschedule the flight as a ground session. Flying an unprepared lesson is the most expensive thing you can do in training.

The simulator is for procedures, not for feel.

A home simulator (Microsoft Flight Simulator X, Microsoft Flight Simulator 2020 or 2024, or X-Plane) is not loggable time and cannot teach the feel of the flare or a real crosswind. It is superb for flows, checklists, power settings, pattern geometry, radio calls, instrument scan, and navigation, which is where most students burn airplane hours. Sim profiles are marked SIM; they are optional in the sense that you can skip them and pay for the same learning at the airplane's hourly rate.

Ground study is integrated, not separate.

There is no separate ground school in this syllabus. The knowledge for the written and the oral is assigned lesson by lesson, in the order you need it, so that the written test at the end is a review rather than a cram.



Completion standards come from the ACS.

Where the ACS publishes a tolerance, it is quoted in the lesson. The number is introduced the first time a task appears so you know what you are working toward; you are graded to it by the second or third time you fly the task, and every task is at the ACS standard before the stage check that follows it. There is no separate 'student standard' to unlearn later.

What the hours add up to, honestly.

Flown once with nothing repeated, the lessons in this book total about 45 hours in the airplane, and they clear every minimum in 14 CFR 61.109(a): at least 20 dual, 10 solo (5 of them cross-country; F12 counts as 0.5 dual and 1.5 solo), 3 dual cross-country, 3 dual night with a cross-country of more than 100 nm and ten full-stop landings (F15 and F16), 3 dual instrument (F10 and F17), and 3 of checkride preparation within the two months before the test (F23 to F26). Nobody flies a syllabus once with nothing repeated. The national average is 60 to 75 hours; plan a structured, well-prepared student at 55 to 65, and treat 40 as the legal floor, not a goal.

The numbers are Cessna 172S, steam gauges.

Speeds, flap settings, and the run-up (rotate 55, climb 74, best glide 68, 1,800 RPM) are the 172S POH values with the round-dial panel. If you train in a G1000 172, a 172R or 172N, a Piper, or anything else, substitute the numbers from your airplane's POH; the sequence, the standards, and the study assignments do not change. In a G1000 airplane, the primary flight display scan replaces the six-pack tour in G3 and S2.

Lesson codes.

G = ground session, S = simulator profile flown at home, F = flight lesson in the airplane, C = check or test. Durations are typical, not maximums; a lesson repeats until the standard is met, and repeating a lesson is normal.

The Areas of Operation.

I Preflight Preparation · II Preflight Procedures · III Airport and Seaplane Base Operations · IV Takeoffs, Landings, and Go-Arounds · V Performance and Ground Reference Maneuvers · VI Navigation · VII Slow Flight and Stalls · VIII Basic Instrument Maneuvers · IX Emergency Operations · X Multiengine Operations (not applicable) · XI Night Operations · XII Postflight Procedures.

Before every lesson I confirm

- I have read the study assignment and can explain each ACS Knowledge element in my own words.
- I have flown the SIM profile (if one is listed) and written down what went wrong.
- I know the completion standards for today's tasks and the numbers I will be held to.
- I have run IMSAFE on myself and PAVE on the flight, and I have written down one risk and how I will mitigate it.
- I have the airport diagram, the POH checklist, and this lesson page with me.



THE LESSONS

Stage 0 - Foundations before the first flight

Four ground sessions and two simulator profiles that cost nothing but time and pay for themselves in the first ten hours. You will meet the airplane already knowing how it flies, how its systems work, what the rules are, and how a professional thinks about risk.

G1 · Safety, aeronautical decision-making, and risk management

G1

Safety, aeronautical decision-making, and risk management

Ground · 2.0 hr

OBJECTIVE

Understand why the FAA tests ADM on every task, and adopt the tools (PAVE, IMSAFE, 3P, DECIDE) you will use before every flight for the rest of your career. Learn why checklists are read, not recited.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.I.H Human Factors (ADM, hazardous attitudes)
- Risk Management elements of every ACS task

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 2 - Aeronautical Decision-Making	all sections: ADM process, PAVE, IMSAFE, DECIDE, 3P, hazardous attitudes and their antidotes, stress, workload management
<u>Risk Management Handbook</u> FAA-H-8083-2A	Chapters 1-3	Introduction to risk management · Hazards vs. risks · The 3P model and single-pilot resource management
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	Introduction and Appendix (Risk Management explained)	read the front matter of the ACS: how examiners evaluate risk management
<u>Aeronautical Information Manual</u> AIM	<u>8-1-1</u> Fitness for Flight	the IMSAFE items from the FAA's side

3 · WHAT WE WILL DO IN THE LESSON

- 1 Instructor and student agree the ground rules of the program: read first, sim second, fly third; checklists read aloud; go-arounds are free.
- 2 Work three real scenarios with PAVE (Pilot, Aircraft, enVironment, External pressures) and the 3P model (Perceive, Process, Perform).
- 3 Identify the five hazardous attitudes (anti-authority, impulsivity, invulnerability, macho, resignation) and their antidotes; pick the one that is most likely yours.
- 4 Introduce the checklist philosophy: challenge-response, flow then checklist, and why memory items exist only for emergencies.
- 5 Set up the personal minimums worksheet (ceiling, visibility, wind, crosswind) you will raise and lower deliberately, never in the moment.

COMPLETION STANDARDS



- Explain PAVE, IMSAFE, and 3P without notes and apply them to a scenario the instructor gives you.
- State the five hazardous attitudes and antidotes.
- Written personal-minimums sheet completed.

COMMON ERRORS

- Treating ADM as a checkride topic instead of a habit.
- Personal minimums set once and never revisited.
- Confusing a hazard (thing) with a risk (likelihood times consequence).

BEFORE THE NEXT LESSON

Read for G2. Install the simulator and set it up using Appendix A; you will need it for S1.



G2 · How an airplane flies: principles of flight, aerodynamics, and the controls

G2

How an airplane flies: principles of flight, aerodynamics, and the controls

Ground + S1 · 2.0 hr + 45 min sim

OBJECTIVE

Explain lift, drag, thrust, and weight; angle of attack and the stall; stability; left-turning tendencies; and what each control and trim does, so nothing in the airplane is a surprise.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.I.F Performance and Limitations (knowledge)
- PA.VII Slow Flight and Stalls (knowledge foundations)
- Foundations for every maneuver in Areas IV, V, VII

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25C	Chapter 4 - Principles of Flight	Structure of the atmosphere, Bernoulli and Newton, airfoils, angle of attack
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25C	Chapter 5 - Aerodynamics of Flight	the four forces, lift and AOA, drag, stalls, load factor, turns, torque and P-factor, stability
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25C	Chapter 6 - Flight Controls	primary controls, trim, flaps, the 172's flap system
Airplane Flying Handbook FAA-H-8083-3C	Chapter 1 - Introduction to Flight Training	role of the FAA, the instructor, the student; practical test

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S1 - Meet the airplane. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. Start on the runway. Do not take off. Identify every instrument and control from the PHAK chapter 8 diagram, move each control and watch the surfaces (outside view), set trim, run the flaps through 0-10-20-30 degrees, set 1,000 rpm and taxi to the run-up area and back using the airport diagram. Practice looking outside 90 percent of the time.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Whiteboard the four forces in level flight, a climb, and a descent; explain why pitch controls airspeed and power controls altitude on approach.
- 2 Explain angle of attack vs. pitch attitude; why an airplane can stall at any airspeed and any attitude.
- 3 Left-turning tendencies: torque, P-factor, spiraling slipstream, gyroscopic precession, and what right rudder is for.
- 4 Load factor: why a 60-degree bank doubles stall speed, and what maneuvering speed means.

COMPLETION STANDARDS

- Explain each topic in plain English to the instructor without notes.
- S1 completed with the control-and-instrument tour written up.

COMMON ERRORS



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- Thinking the yoke controls altitude and the throttle controls speed.
- Memorizing definitions without being able to draw the picture.

BEFORE THE NEXT LESSON

Read for G3.

**Aircraft systems, flight instruments, and the POH**

Ground + S2 · 2.0 hr + 45 min sim

OBJECTIVE

Know the 172's engine, fuel, electrical, oil, flight instruments, and pitot-static system well enough to preflight them, start them, and recognize when they are lying to you.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.I.G Operation of Systems
- PA.II.C Engine Starting
- PA.IX.C Systems and Equipment Malfunctions (knowledge)

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 7 - Aircraft Systems	powerplant, propeller, induction, ignition, oil, fuel, electrical, environmental
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 8 - Flight Instruments	pitot-static instruments and errors, gyroscopic instruments, magnetic compass errors
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 9 - Flight Manuals and Other Documents	POH/AFM sections, required documents (ARROW), placards
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Section 7 - Airplane and Systems Descriptions	your school's airplane
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Section 4 - Normal Procedures	the checklists you will use in S2

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S2 - Cold and dark start. Load your saved cold-and-dark flight (Appendix A). Run the POH Before Start, Engine Start, Before Taxi, and Run-Up checklists out loud from the kneeboard: master on, beacon, mixture rich, throttle cracked, prime as required, clear prop, start; check oil pressure within 30 seconds; avionics on; taxi; run-up at 1,800 rpm, magneto check (drop within limits, no more than 50 rpm differential), carb heat (if equipped), instruments checked and set. Shut down with the checklist. Repeat until the flow is automatic.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Trace the fuel from the tanks to the cylinders on the POH diagram; explain the fuel selector and why BOTH is used for takeoff and landing.
- 2 Electrical: alternator, battery, master switch halves, ammeter/low-voltage light, what dies when the alternator fails and how long the battery lasts.
- 3 Pitot-static: what a blocked pitot tube does to the airspeed indicator, what a blocked static port does to all three instruments, alternate static.
- 4 Gyros: vacuum vs. electric, precession, why the heading indicator is reset to the compass every 15 minutes.
- 5 ARROW documents and the inspections in 91.409, 91.413 and 91.207 (annual, 100-hour, transponder, ELT).

COMPLETION STANDARDS



- Explain each system from memory using the POH diagrams.
- S2: cold start to shutdown by checklist with no skipped items.

COMMON ERRORS

- Starting the engine from memory instead of the checklist.
- Not knowing what the ammeter is telling you.

BEFORE THE NEXT LESSON

Read for G4. Bring questions about anything in Part 61 that seems unclear; it usually is.

**OBJECTIVE**

Know the rules you personally must follow as a student and private pilot, what makes the airplane legal, and how a towered and non-towered airport operates.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.I.A Pilot Qualifications
- PA.I.B Airworthiness Requirements
- PA.III.A Communications, Light Signals, and Runway Lighting Systems (knowledge)

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Federal Aviation Regulations</u> 14 CFR	<u>61.3</u> , <u>61.23</u> , <u>61.56</u> , <u>61.57</u> , <u>61.83-61.95</u> , <u>61.103-61.113</u>	certificates, medical, flight review, currency, student pilot rules, private pilot requirements and privileges
<u>Federal Aviation Regulations</u> 14 CFR	<u>91.3</u> , <u>91.7</u> , <u>91.103</u> , <u>91.113</u> , <u>91.119</u> , <u>91.203-91.215</u> , <u>91.409</u> , <u>91.417</u>	PIC authority, airworthiness, preflight action, right-of-way, minimum altitudes, required equipment and documents, inspections, records
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 14 - Airport Operations	runway markings, signs, lighting, traffic patterns, radio basics, towered vs. non-towered
<u>Aeronautical Information Manual</u> AIM	Chapter 2 (lighting and marking) and <u>4-1-1</u> through <u>4-3-3</u> (ATC services, radio technique, airport operations)	read the phraseology examples aloud
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	Areas I.A and I.B task tables	every Knowledge element listed

3 · WHAT WE WILL DO IN THE LESSON

- 1 Student certificate, medical, and logbook: what must be on board, what must be current, what an endorsement is.
- 2 Airworthiness: ARROW, required inspections, inoperative equipment and 91.213, and the 91.205 day-VFR equipment list (learn the list, not the mnemonic).
- 3 Read your home airport's diagram, Chart Supplement entry, and the AIM light-gun signals table; brief a taxi route from the ramp to the runway with every hold-short line named.
- 4 Radio: the four-part call (who you are calling, who you are, where you are, what you want) and the readback rule for runway assignments and hold-short instructions.

COMPLETION STANDARDS

- Answer the ACS I.A and I.B Knowledge elements without notes.
- Brief a taxi route on the diagram, naming every hot spot.
- Give the four-part radio call for taxi and takeoff correctly.

COMMON ERRORS

- Confusing 'what the airplane needs to be legal' with 'what I need to be legal'.
- Treating the 91.205 equipment list as trivia; it is the preflight.

BEFORE THE NEXT LESSON



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Read for F1 and fly S3. Confirm your medical is in hand before scheduling F1.



THE LESSONS

Stage 1 - Pre-solo: learning to fly the airplane

Every fundamental, taught to the ACS standard from the first time you see it. Each flight has a simulator profile to fly the night before so the airplane time goes to the parts a simulator cannot teach.

F1 · Preflight, taxi, and the discovery flight

F1

Preflight, taxi, and the discovery flight

Flight + S3 · 1.5 hr flight, 1.0 hr ground, 45 min sim

OBJECTIVE

Perform a complete preflight inspection by the POH checklist, manage the flight deck, start, taxi, and experience straight-and-level flight and gentle turns with the instructor demonstrating.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.II.A Preflight Assessment
- PA.II.B Flight Deck Management
- PA.II.C Engine Starting
- PA.II.D Taxiing
- PA.II.F Before Takeoff Check
- PA.XII.A After Landing, Parking, and Securing

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Airplane Flying Handbook FAA-H-8083-3C	Chapter 2 - Ground Operations	preflight, visual inspection, engine start, hand propping (know why not), taxiing, before-takeoff check, after-landing and securing
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25C	Chapter 3 - Aircraft Construction	what you are looking at during the walk-around
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Section 4 - Normal Procedures	preflight walk-around diagram and all ground checklists
Aeronautical Information Manual AIM	4-3-18 through 4-3-20 (taxiing) and 7-4-1 (bird hazards)	
Private Pilot Airman Certification Standards FAA-S-ACS-6C	Area II tasks A, B, C, D, F	Knowledge and Risk elements: fuel contamination, hazards on the ramp, taxi collision risks, runway incursions

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S3 - Ground operations. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. Start cold and dark at the ramp. Full start checklist. Get the ATIS from the built-in ATC panel, call Ground for taxi, and taxi the exact route to the run-up area using the printed airport diagram, reading back every hold-short. Run-up by checklist. Taxi back and shut down. Do it twice; the second time say every radio call before you press the key.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Preflight walk-around by the POH diagram, item by item, with the instructor explaining what each item can tell you (fuel sumps, oil, control surfaces, tires, brakes, pitot, static, stall horn, lights).
- 2 Flight deck management: seat position, belts, organizing charts and checklist, passenger briefing (SAFETY: Seatbelts, Air, Fire, Exits, Traffic, Your questions).
- 3 Start by checklist, taxi with the wind-correction control positions from AFH chapter 2, run-up, and a departure with the instructor flying and talking.
- 4 In the air: the instructor demonstrates straight-and-level, gentle climbs, descents, and turns; you follow through on the controls and learn the sight picture.
- 5 Return, after-landing checklist, parking, securing, and the post-flight walk-around.

COMPLETION STANDARDS

- Preflight completed by checklist with no items skipped; correct passenger briefing given.
- Taxi with correct control positions and speed, following the diagram.
- First look at the sight picture for level flight.

COMMON ERRORS

- Rushing the preflight because the instructor is waiting; the instructor is not waiting, the instructor is watching.
- Eyes inside during taxi.
- Death grip on the yoke.

BEFORE THE NEXT LESSON

Read for F2 and fly S4. Write down the sight picture for level flight in the 172 in your own words.



**F2****The four fundamentals and trim**

Flight + S4 · 1.3 hr flight, 45 min sim

OBJECTIVE

Fly straight-and-level, climbs, descents, and turns using outside references, with the airplane trimmed so that you are steering it rather than holding it.

1 · WHAT IS REQUIRED (ACS / FAR)

- Foundations of PA.V, PA.VII, PA.VIII (the ACS has no separate 'four fundamentals' task; every task assumes them)

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Airplane Flying Handbook FAA-H-8083-3C	Chapter 3 - Basic Flight Maneuvers	integrated flight instruction, straight-and-level, trim, level turns, climbs and climbing turns, descents and descending turns
Airplane Flying Handbook FAA-H-8083-3C	Chapter 4 - Energy Management	the energy-state concept: pitch and power together, not separately
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25C	Chapter 5 - Aerodynamics of Flight (turns, load factor)	review
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Section 4 - Normal Procedures (climb and cruise power settings)	know the numbers before the flight

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S4 - Four fundamentals at altitude. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. Start on the runway, take off (full power, rotate 55 KIAS, climb 74 KIAS), climb to 3,000 ft above the airport. Fly two minutes each of: straight-and-level trimmed hands-off at 2,300 rpm; a 500 fpm climb at 74 KIAS; a 500 fpm descent at 90 KIAS with 2,000 rpm; standard-rate turns left and right through 180 degrees holding altitude within 100 ft. Say your power settings out loud. Land however you can; landings are not the point yet.

3b · WHAT WE WILL DO IN THE LESSON

- Climb to the practice area; the instructor demonstrates, then you fly each fundamental with the outside reference first and instruments as a cross-check.
- Trim after every power or pitch change until the airplane holds attitude hands-off for five seconds.
- Level turns at 20 and 30 degrees of bank with coordinated rudder, the ball centered, and back pressure to hold altitude.
- Climbing and descending turns; recognize the sight picture change and the need to lead the level-off by 10 percent of the vertical speed.

COMPLETION STANDARDS

- Altitude within 100 ft and heading within 10 degrees in straight-and-level; airspeed within 10 knots in climbs and descents.
- Airplane trimmed after every change without being told.



COMMON ERRORS

- Chasing the altimeter instead of setting an attitude and waiting.
- Forgetting rudder in the turn entry and rollout.
- Trimming to change attitude instead of to relieve pressure.

BEFORE THE NEXT LESSON

Read for F3 and fly S5. Re-fly S4 if any tolerance was missed.



F3 · Energy management, slow flight, and the first look at stalls

F3

Energy management, slow flight, and the first look at stalls

Flight + S5 · 1.3 hr flight, 45 min sim

OBJECTIVE

Fly the airplane precisely at the bottom of its speed range with full control, understand what the controls feel like near the critical angle of attack, and recover from a power-off stall at the first indication.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.VII.A Maneuvering During Slow Flight
- PA.VII.B Power-Off Stalls (introduction)
- PA.VII.D Spin Awareness (knowledge)

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Airplane Flying Handbook FAA-H-8083-3C	Chapter 5 - Maintaining Aircraft Control: Upset Prevention and Recovery Training	slow flight, stall recognition and recovery, power-off and power-on stalls, spin awareness
Airplane Flying Handbook FAA-H-8083-3C	Chapter 4 - Energy Management	why airspeed and altitude are one resource
Advisory Circular AC	61-67C Stall and Spin Awareness Training	read it once, all of it
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Section 2 (Vs0 40, Vs1 48 KIAS) and Section 4 (stall recovery)	
Private Pilot Airman Certification Standards FAA-S-ACS-6C	VII.A, VII.B, VII.D task tables	Skill elements and the exact tolerances

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S5 - Slow flight and stalls. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. Climb to 3,500 ft above the airport. Clearing turns. Slow flight: power 1,500 rpm, flaps 30 in stages, pitch to hold altitude, then power to hold 55 KIAS with the stall horn just silent; fly straight, then 10-degree banked turns; recover. Power-off stall: 1,500 rpm, flaps 30, 65 KIAS descent, then power idle and pitch up steadily until the break; recover at the first indication with pitch to reduce AOA, full power, flaps to 20, positive rate, flaps up. Note: the simulator's stall behavior is a cartoon of the real thing; the purpose here is the sequence of actions, not the feel.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Clearing turns before every maneuver, every time, for the rest of your life.
- 2 Slow flight per ACS VII.A: configure, slow to an airspeed at which any further increase in AOA would result in a stall warning, hold altitude and heading through straight and turning flight.
- 3 Instructor demonstrates a power-off stall; you fly two, recovering at the first indication (horn, buffet) with the AFH recovery sequence: reduce AOA, apply power, level the wings, return to the desired flight path.
- 4 Spin awareness discussion in the air: what uncoordinated flight at the stall does, and why the rudder is centered before you pull.



COMPLETION STANDARDS

- Slow flight: altitude within 100 ft, heading within 10 degrees, airspeed plus 10 / minus 0 knots, bank within 10 degrees (ACS VII.A).
- Power-off stall recovery at the first indication with minimum altitude loss and coordinated controls.

COMMON ERRORS

- Recovering with pitch only and forgetting the power.
- Trying to hold altitude with elevator at the stall instead of reducing AOA.
- Skipping clearing turns.

BEFORE THE NEXT LESSON

Read for F4 and fly S6. Re-read AC 61-67.



F4 · Power-on and power-off stalls to ACS standards, spin awareness

F4

Power-on and power-off stalls to ACS standards, spin awareness

Flight + S6 · 1.3 hr flight, 30 min sim

OBJECTIVE

Perform power-off and power-on stalls in the ACS configurations with coordinated recovery at the first indication, and demonstrate the spin-prevention discipline of coordinated flight.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.VII.B Power-Off Stalls
- PA.VII.C Power-On Stalls
- PA.VII.D Spin Awareness

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Airplane Flying Handbook</u> FAA-H-8083-3C	Chapter 5 (power-on stalls, accelerated stalls, secondary stalls, spins)	read the spin section even though you will not spin
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 5 - stalls and spins subsection	
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	VII.B, VII.C, VII.D	note the setup: stalls are done at an altitude that allows recovery no lower than 1,500 ft AGL

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S6 - Stall series. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. At 3,500 ft above the airport: two power-off stalls (landing configuration, wings level, then in a 20-degree bank) and two power-on stalls (takeoff configuration, 65 KIAS, full power, pitch up until the break, recover). Say the recovery steps out loud each time.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Power-off stalls in the landing configuration, wings level and in a 20-degree banked turn, recovering at the first indication.
- 2 Power-on stalls in the takeoff configuration, wings level and banked, with attention to right rudder in the pitch-up; recover at the first indication.
- 3 Instructor demonstrates the onset of a spin entry from an uncoordinated stall (recovery immediately); you see why the ball matters.
- 4 Return to the airport with you flying the whole arrival including the radio calls.

COMPLETION STANDARDS

- ACS VII.B and VII.C: establish the correct configuration, maintain a specified heading plus or minus 10 degrees or bank plus or minus 10 degrees, recover at the first indication with coordinated use of controls, minimum altitude loss.
- Verbal spin recovery (PARE: Power idle, Ailerons neutral, Rudder opposite, Elevator forward) from memory.

COMMON ERRORS

- Aileron use at the stall.
- Recovering with excessive nose-down attitude and losing 300 ft.
- Letting the nose yaw in the power-on setup.



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BEFORE THE NEXT LESSON

Read for F5 and fly S7.

**F5****Ground reference maneuvers and wind**

Flight + S7 · 1.2 hr flight, 45 min sim

OBJECTIVE

Fly a constant ground track around a rectangular course, in S-turns across a road, and around a point by varying bank angle with wind, while dividing attention between the ground, traffic, and the instruments.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.V.B Ground Reference Maneuvers
- PA.V.A Steep Turns (introduction)

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Airplane Flying Handbook</u> FAA-H-8083-3C	Chapter 7 - Ground Reference Maneuvers	drift and ground track control, rectangular course, S-turns, turns around a point
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 16 - Navigation (wind and ground track basics)	
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	V.B	altitude 600 to 1,000 ft AGL, the tolerances

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S7 - Ground reference with wind. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. Set weather to Custom with a 10-knot surface wind. Descend to 800 ft AGL over open terrain. Fly a rectangular course around a field, S-turns across a straight road, and turns around a water tower, steepest bank on the downwind side. Use the outside view; the point is the ground track, not the instruments.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Select an area, altitude 600-1,000 ft AGL, emergency landing field identified first.
- 2 Rectangular course entered on the downwind leg at a 45-degree angle, then S-turns, then turns around a point, each with the steepest bank downwind and shallowest upwind.
- 3 Constant altitude and airspeed; divide attention outside; identify the wind from drift before starting.

COMPLETION STANDARDS

- ACS V.B: altitude within 100 ft, airspeed within 10 knots, constant radius or ground track, coordinated, correct entry.
- Steep turns introduced at 45 degrees of bank: the ACS numbers (altitude within 100 ft, airspeed within 10 knots, bank within 5 degrees, rollout within 10 degrees) are stated now and graded to by the second or third look, in Stage 3.

COMMON ERRORS

- Fixating on the reference point and forgetting altitude.
- Same bank angle all the way around.
- Starting the maneuver without finding the wind.

BEFORE THE NEXT LESSON

Read for F6 and fly S8, which is the full traffic pattern profile. This is the most important sim session in Stage 1; fly it twice.



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F6 · Airport operations, radio communications, and the traffic pattern

F6**Airport operations, radio communications, and the traffic pattern**

Flight + S8 · 1.3 hr flight, 60 min sim

OBJECTIVE

Fly a complete traffic pattern with correct entries, legs, altitudes, spacing, configuration changes, and radio calls at your home airport, with the instructor handling the landing flare.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.III.A Communications, Light Signals, and Runway Lighting Systems
- PA.III.B Traffic Patterns
- PA.IV.A Normal Takeoff and Climb (introduction)

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Airplane Flying Handbook</u> FAA-H-8083-3C	Chapter 8 - Airport Traffic Patterns	standard pattern, entry, legs, altitude, departure
<u>Airplane Flying Handbook</u> FAA-H-8083-3C	Chapter 6 - Takeoffs and Departure Climbs (normal takeoff)	
<u>Aeronautical Information Manual</u> AIM	<u>4-3-2</u> , <u>4-3-3</u> , <u>4-3-4</u> (airport operations, traffic patterns, visual indicators), <u>4-2-1</u> through <u>4-2-4</u> (radio technique and phraseology), <u>4-3-13</u> (light signals)	
<u>Advisory Circular</u> AC	90-66C Non-Towered Airport Flight Operations	if your airport is non-towered
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 14 - Airport Operations	review
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	III.A and III.B	

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S8 - The traffic pattern (the core profile). Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. Start at the ramp cold and dark. ATIS, taxi call, run-up, takeoff clearance with 'closed traffic'. Fly six patterns: rotate 55, climb 74 KIAS; crosswind turn past the departure end within 300 ft of pattern altitude; downwind at pattern altitude, 2,100-2,200 rpm, 90 KIAS, runway half to three-quarters of a mile off the wing; abeam the numbers 1,500 rpm, flaps 10, 80 KIAS; base at 45 degrees past the threshold, flaps 20, 70-75 KIAS; final flaps 30, 65 KIAS, stabilized by 500 ft AGL or go around; touch-and-go: flaps 10, trim, full power. Fly at least two intentional go-arounds: full power, flaps 20, positive rate, flaps 10, then up. Say every radio call. Last pattern full stop, taxi, shutdown.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Takeoff briefing before every takeoff (runway, rotation and climb speeds, abort point, engine failure plan below and above 1,000 ft).
- 2 Normal takeoff: full power, engine instruments checked, airspeed alive, rotate at 55, Vy 74, right rudder.

- 3 Full pattern flown by you with the numbers from S8; the instructor takes the flare and rollout on the first two, then follows through.
- 4 Radio: you make every call; the instructor corrects phraseology on the ground, not in the air.

COMPLETION STANDARDS

- ACS III.B: pattern altitude within 100 ft, airspeed within 10 knots, proper spacing, correct entry and exit, awareness of other traffic.
- Every radio call complete on the first try.
- Collision avoidance, windshear avoidance, and wake turbulence avoidance briefed before the flight and applied in the pattern (61.87(d)(7)); the instructor logs all three.

COMMON ERRORS

- Turning crosswind too early or too late.
- Flying the downwind too close (steep base) or too wide (long final).
- Forgetting to trim after each configuration change so the approach is flown with muscle.

BEFORE THE NEXT LESSON

Read for F7 and fly S8 again with two more go-arounds.



**F7****Normal takeoffs and landings, go-arounds**

Flight + S8 · 1.3 hr flight, 45 min sim

OBJECTIVE

Land the airplane: stabilized approach, roundout, flare, touchdown on the main wheels on the centerline, and a rollout under control; and go around without hesitation when the approach is not stabilized.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.IV.A Normal Takeoff and Climb
- PA.IV.B Normal Approach and Landing
- PA.IV.M Forward Slip to a Landing (introduction; required before solo, 61.87(d)(14))
- PA.IV.N Go-Around/Rejected Landing

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Airplane Flying Handbook</u> FAA-H-8083-3C	Chapter 9 - Approaches and Landings	stabilized approach, roundout, touchdown, after-landing roll, go-around, faulty approaches and landings
<u>Airplane Flying Handbook</u> FAA-H-8083-3C	Chapter 6 - Takeoffs and Departure Climbs	review normal takeoff; read rejected takeoff
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Section 4 (normal landing 60-70 KIAS flaps 30; balked landing procedure)	
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	IV.A, IV.B, IV.N	the 400-ft touchdown zone standard and the go-around callout

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S8 again, with emphasis on the stabilized-approach gate at 500 ft AGL and calling 'go around' out loud at least twice per session. Add: pick a touchdown aim point (the 1,000-ft markers) before turning final and grade yourself on it.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Six to eight landings, full stop and taxi back for the first two, then touch-and-goes.
- 2 Instructor calls the roundout height until your eyes learn it; then you call it.
- 3 At least two instructor-directed go-arounds from short final, plus any you call yourself.
- 4 One forward slip to a landing: the instructor demonstrates, then you fly one from a high final with the flaps at the POH-permitted setting, holding the centerline with rudder and bank; the instructor logs it as the 61.87(d)(14) item.

COMPLETION STANDARDS

- ACS IV.B: stabilized approach at the recommended speed (or 1.3 Vs0) plus 10 / minus 5 knots, touchdown at a proper pitch attitude within 400 ft beyond the specified point, no side drift, longitudinal axis aligned with the centerline.
- ACS IV.N: go-around initiated promptly, power, flaps retracted per the POH, Vy plus 10 / minus 5.
- Forward slip to a landing demonstrated and flown with the instructor before solo (61.87(d)(14)); the instructor logs it. Refined to ACS IV.M standards in Stage 3.

COMMON ERRORS

- Looking straight down at the runway in the flare instead of at the far end.
- Flaring too high, then pushing forward (never push in the flare; hold or go around).
- Deciding to salvage a bad approach.



- Slipping with flaps beyond the POH limitation; releasing the slip late and landing in a crab.

BEFORE THE NEXT LESSON

Fly S8 with a 10-knot wind 30 degrees off runway heading (Appendix A weather setup) before F8.

**F8****Crosswind takeoffs and landings**

Flight + S9 · 1.3 hr flight, 45 min sim

OBJECTIVE

Take off and land with a crosswind using the sideslip technique, holding the centerline with the upwind wing down and the nose straight with rudder, within the airplane's demonstrated crosswind component.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.IV.A Normal and Crosswind Takeoff and Climb
- PA.IV.B Normal and Crosswind Approach and Landing

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Airplane Flying Handbook</u> FAA-H-8083-3C	Chapter 6 (crosswind takeoff) and Chapter 9 (crosswind approach and landing, sideslip and crab methods)	
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 11 - Aircraft Performance (crosswind component chart)	compute the component for a 15-knot wind 40 degrees off the runway
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Section 4 (maximum demonstrated crosswind 15 knots)	

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S9 - Crosswinds. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. Weather Custom: 10 knots from 30 degrees left of the runway, then 15 knots at 45 degrees. Takeoff with full aileron into the wind reducing as speed builds; landings with the sideslip established on final, upwind main touching first, aileron increased through the rollout. Compute the crosswind component for each before you fly it.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Crosswind takeoffs: aileron into the wind, hold the nose on the centerline with rudder, slightly longer ground roll, positive rotation.
- 2 Crosswind landings with the wing-low sideslip from short final; the instructor demonstrates the crab-then-kick method for comparison.
- 3 Gust factor: add half the gust to approach speed.

COMPLETION STANDARDS

- Same as IV.A and IV.B, with the airplane's longitudinal axis aligned with the runway at touchdown and no side drift, in an actual crosswind.

COMMON ERRORS

- Releasing the aileron after touchdown.
- Letting the airplane drift in the flare because the crab was not converted to a slip.
- Flying a crosswind that exceeds your personal minimum because the instructor is aboard.

BEFORE THE NEXT LESSON

Read for F9 and fly S10.



free copy - pilotcareersolutions.com/free

**F9****Emergency procedures: engine failure, emergency descent, systems malfunctions**

Flight + S10 · 1.3 hr flight, 45 min sim

OBJECTIVE

Execute the memory items and checklists for an engine failure at altitude and in the pattern, an emergency descent, and the common systems malfunctions (electrical, oil pressure, carb ice or induction, pitot-static), and choose a landing site quickly.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.IX.A Emergency Descent
- PA.IX.B Emergency Approach and Landing (Simulated)
- PA.IX.C Systems and Equipment Malfunctions
- PA.IX.D Emergency Equipment and Survival Gear

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Airplane Flying Handbook FAA-H-8083-3C	Chapter 18 - Emergency Procedures	emergency landings, engine failure after takeoff, emergency descents, in-flight fire, systems malfunctions, ELT
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Section 3 - Emergency Procedures	memorize the boxed memory items; the rest is checklist
Aeronautical Information Manual AIM	6-1-1 through 6-3-4 (emergency procedures, transponder 7700, 121.5)	
Private Pilot Airman Certification Standards FAA-S-ACS-6C	IX.A through IX.D	

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S10 - Engine failures. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. At 3,000 ft AGL pull the throttle to idle without warning (or arm an engine failure before the flight: MSFS 2024 and 2020 use the Failures tab of the aircraft selection screen; FSX uses Settings > Failures): pitch for best glide 68 KIAS, trim, pick a field into the wind, restart flow (fuel selector BOTH, mixture rich, carb heat/alternate air, magnetos BOTH, primer locked), simulated mayday on 121.5 with position, squawk 7700, passenger brief, secure the engine, fly the pattern to the field, go around at 500 ft. Then engine failure at 300 ft after takeoff: pitch down immediately, land straight ahead within 30 degrees either side, no turn back. Repeat five times.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Simulated engine failure at altitude: best glide, field selection, restart flow, communicate, secure, approach to a go-around at a safe altitude.
- 2 Simulated engine failure after takeoff at a safe altitude in the pattern: the 'impossible turn' briefing and why the answer is straight ahead below your briefed altitude.
- 3 Emergency descent per the POH; simulated fire and electrical failure by checklist.



4 Emergency equipment: ELT, fire extinguisher, survival gear for your area.

COMPLETION STANDARDS

- ACS IX.B: establish and maintain best glide plus or minus 10 knots, select a suitable landing area, complete the checklist, fly a pattern to the selected area.
- Memory items recited without hesitation on the ground.

COMMON ERRORS

- Trying to restart before pitching for glide.
- Picking a field and then changing your mind twice.
- Forgetting to fly the airplane while working the checklist.

BEFORE THE NEXT LESSON

Read for F10 and fly S11. Instrument flying in the sim is one of the best uses of it.

**F10****Basic instrument maneuvers (hood work)**

Flight + S11 · 1.5 hr flight (at least 1.3 under the hood), 60 min sim

OBJECTIVE

Control the airplane solely by reference to instruments: straight-and-level, constant-airspeed climbs and descents, turns to headings, and recovery from unusual attitudes, so that an inadvertent cloud is survivable.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.VIII.A Straight-and-Level Flight
- PA.VIII.B Constant Airspeed Climbs
- PA.VIII.C Constant Airspeed Descents
- PA.VIII.D Turns to Headings
- PA.VIII.E Recovery from Unusual Flight Attitudes

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Instrument Flying Handbook</u> FAA-H-8083-15B	Chapter 3 - Flight Instruments (review) and Chapter 4 - Airplane Attitude Instrument Flying	control and performance method, the scan, common errors
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 8 - Flight Instruments (review) and Chapter 17 (spatial disorientation)	
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	VIII.A through VIII.E	tolerances

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S11 - Instrument scan. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. Set weather to overcast 500 ft with 1 mile visibility so you are in cloud after takeoff (this is the sim doing what it does best). Climb to 3,000 ft: straight-and-level for three minutes holding altitude within 100 ft and heading within 10 degrees; constant-airspeed climb at 74 KIAS and descent at 90 KIAS; standard-rate turns to assigned headings using the turn coordinator and timing (3 degrees per second). Have a friend put the airplane in an unusual attitude (or use the sim's pause and re-position) and recover: nose high, add power, lower the nose, level wings; nose low, reduce power, level wings, then raise the nose.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Under the view-limiting device: the instrument scan, control and performance, trim.
- 2 Each ACS VIII task to tolerance; recoveries from nose-high and nose-low unusual attitudes with the correct sequence.
- 3 Instructor discusses the 178-second statistic and the real answer: a 180-degree standard-rate turn out of the cloud.

COMPLETION STANDARDS

- ACS VIII: altitude within 200 ft, heading within 20 degrees, airspeed within 10 knots; unusual attitude recovery with correct sequence and coordinated controls.

COMMON ERRORS

- Fixating on one instrument.



- Over-controlling; small corrections and wait.
- Reversing the sequence in the nose-low recovery (pulling before leveling the wings).

BEFORE THE NEXT LESSON

Study for C1, the pre-solo knowledge test. Everything from G1-G4 plus your airport and airplane.



C1 · Pre-solo knowledge test and stage check

C1**Pre-solo knowledge test and stage check**

Check · 1.5 hr ground, 1.3 hr flight

OBJECTIVE

Demonstrate the knowledge required by 61.87(b) and the flight proficiency of 61.87(d) to a second instructor or the chief instructor, so that solo is a decision made on evidence.

1 · WHAT IS REQUIRED (ACS / FAR)

- 61.87(b) knowledge; 61.87(d) maneuvers; all Stage 1 ACS tasks

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Federal Aviation Regulations</u> 14 CFR	<u>61.87</u> (all), <u>61.89</u> (student pilot limitations), <u>91.103-91.159</u> (flight rules and VFR weather minimums)	
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Sections 2, 3, 4	limitations, emergencies, normal procedures for your airplane
<u>FAA charts and Chart Supplement</u> faa.gov digital products	Your home airport: Chart Supplement entry, airport diagram, sectional chart within 25 nm	
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	Areas II, III, IV, V.B, VII, VIII, IX	review every Risk Management element

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

Fly S8 (pattern) and S10 (engine failures) once more.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Written pre-solo knowledge test (instructor-made, open-book is allowed by regulation but you should not need it), reviewed to 100 percent.
- 2 Stage check flight: preflight, taxi, takeoff, four fundamentals, slow flight, stalls, ground reference, simulated engine failure, patterns and landings, a forward slip to a landing, go-around, all to the ACS standards with the check instructor not touching the controls.

COMPLETION STANDARDS

- Every task to ACS standard without instructor assistance.
- Solo endorsements (61.87(n), AC 61-65K) given only when both instructors agree.

COMMON ERRORS

- Studying only the flight part and being surprised by the regulations questions.

BEFORE THE NEXT LESSON

Sleep. Fly S8 once more the night before F11.



F11 · First solo

F11**First solo**

Flight · 0.5 hr solo after 0.5 hr dual

OBJECTIVE

Fly three takeoffs and landings to a full stop alone, in calm conditions, at your home airport, with the instructor watching from the ground.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.IV.A, PA.IV.B, PA.IV.N, PA.III.B (solo)

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Federal Aviation Regulations 14 CFR	61.87 (n) endorsement text, 61.89 limitations	know what you may and may not do alone
Aeronautical Information Manual AIM	4-3-3 (traffic patterns) review	

3 · WHAT WE WILL DO IN THE LESSON

- 1 Instructor flies three patterns with you, exits the airplane, and you fly three full-stop landings solo.
- 2 Weather within your personal minimums and the instructor's solo limits; a calm morning is the goal.
- 3 Debrief: what surprised you (the climb rate without the instructor's weight is the usual answer).

COMPLETION STANDARDS

- Three safe full-stop landings with no instructor input. That is the only standard.

COMMON ERRORS

- Rushing the run-up because you are excited.
- Forgetting the airplane is lighter and climbs and floats more.

BEFORE THE NEXT LESSON

Read for F12 and fly S8 again, the pattern profile; the navigation profiles begin with G7.



F12 · Solo practice: pattern and maneuvers review

F12**Solo practice: pattern and maneuvers review**

Solo + dual · 0.5 hr dual review, then 1.5 hr solo

OBJECTIVE

Consolidate the pre-solo maneuvers alone, within the limits of your solo endorsement, and begin building the 10 hours of solo time.

1 · WHAT IS REQUIRED (ACS / FAR)

- Areas IV, V.B, VII (solo practice within 61.89 and the endorsement limits)

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Airplane Flying Handbook</u> FAA-H-8083-3C	Chapters 5, 7, 9 (review the maneuvers you fly today)	
<u>Federal Aviation Regulations</u> 14 CFR	<u>61.89</u>	

3 · WHAT WE WILL DO IN THE LESSON

- 1 Dual review of the practice-area procedures and the solo practice-area limits, then a solo flight to the practice area: slow flight, stalls, ground reference, return, patterns.
- 2 Every solo flight begins with a written plan reviewed by the instructor and ends with a written self-debrief.

COMPLETION STANDARDS

- Maneuvers within ACS tolerances by your own honest assessment, confirmed by the instructor on the next dual flight.

COMMON ERRORS

- Practicing errors; if a maneuver is not meeting the standard, stop and ask for dual instruction.

BEFORE THE NEXT LESSON

Read for G5. Cross-country begins with weather.



THE LESSONS

Stage 2 - Cross-country: navigation, weather, night, and solo cross-countries

Four ground sessions build the knowledge the oral exam is mostly made of, then dual and solo cross-countries put it to work. Every route is flown in the simulator first.

G5 · Weather theory and weather services

G5

Weather theory and weather services

Ground · 2.5 hr

OBJECTIVE

Read a standard briefing, METARs, TAFs, area forecasts, AIRMETs and SIGMETs, winds aloft, and the graphical products, and recognize the weather that kills VFR pilots: low ceilings and visibility, thunderstorms, icing, and wind shear.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.I.C Weather Information

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 12 - Weather Theory and Chapter 13 - Aviation Weather Services	the complete introduction; read both
<u>Aviation Weather Handbook</u> FAA-H-8083-28	Aviation Weather Handbook: the chapters on atmospheric pressure and altimetry, wind, clouds and stability, fronts, thunderstorms, icing, fog and visibility, and the chapters on observations (METAR), forecasts (TAF), advisories (AIRMET/SIGMET), and standard weather briefings	use the table of contents; it is a reference book, not a novel
<u>Aeronautical Information Manual</u> AIM	<u>7-1-1</u> through <u>7-1-30</u> (meteorology, briefings, PIREPs, products)	
<u>Federal Aviation Regulations</u> 14 CFR	<u>91.103</u> , <u>91.155</u> , <u>91.157</u> (preflight action, VFR weather minimums, special VFR)	memorize the basic VFR minimums by airspace
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	I.C task table	every Knowledge element is a likely oral question

3 · WHAT WE WILL DO IN THE LESSON

- 1 Decode today's actual METAR and TAF for your airport and a destination 100 nm away; get a standard briefing from 1800wxbrief.com and Leidos/FAA weather resources (aviationweather.gov) and walk through it.
- 2 Fronts and air masses; stability; fog types; thunderstorm life cycle and the 20-mile rule; structural icing conditions; density altitude.
- 3 VFR weather minimums by airspace class, from memory, with the reason each exists.
- 4 Personal weather minimums entered on your minimums sheet.

COMPLETION STANDARDS



- Decode a METAR/TAF pair and brief a go/no-go with reasons.
- State VFR minimums for Class B, C, D, E, and G, day and night.

COMMON ERRORS

- Reading the forecast and not the observation trend.
- Treating marginal VFR as 'legal, therefore fine'.

BEFORE THE NEXT LESSON

Read for G6. Bring a current sectional chart (free PDF from the FAA digital products page, or the paper chart).



Airspace, charts, and the Chart Supplement

Ground · 2.5 hr

OBJECTIVE

Identify every class of airspace on a sectional chart, know its entry and equipment requirements and VFR minimums, and decode chart symbols, airport data, and the Chart Supplement.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.I.E National Airspace System
- PA.VI.A Pilotage and Dead Reckoning (chart reading)

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 15 - Airspace	classes A-G, special use airspace, TFRs, TRSA, ADIZ
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 16 - Navigation (sectional charts subsection)	
<u>Aeronautical Information Manual</u> AIM	Chapter 3 - Airspace (3-1 through 3-5)	the source document
<u>Federal Aviation Regulations</u> 14 CFR	<u>91.126</u> through <u>91.135</u> (operations in each class), <u>91.215</u> (transponder), <u>91.225</u> (ADS-B)	
<u>FAA charts and Chart Supplement</u> faa.gov digital products	FAA Chart User's Guide (digital products page): sectional chart legend, airport symbols, airspace depictions	read the legend pages until nothing on the chart is unknown to you

3 · WHAT WE WILL DO IN THE LESSON

- 1 On your sectional: find and explain every airspace boundary within 50 nm of home, the floors and ceilings, and what you need to enter each.
- 2 Chart Supplement: decode a full airport entry (runways, lighting, frequencies, remarks, hot spots).
- 3 Special use airspace: MOAs, restricted areas, TFRs and how to check for them; the ADIZ if applicable.
- 4 Transponder and ADS-B rule airspace, Mode C veil.

COMPLETION STANDARDS

- Explain the entry requirements, equipment, and VFR minimums for every airspace class from memory.
- Decode any symbol the instructor points to on the sectional.

COMMON ERRORS

- Confusing Class E floors (700 vs. 1,200 ft AGL vs. surface).
- Not checking TFRs on every flight.

BEFORE THE NEXT LESSON

Read for G7. You will plan your first cross-country in G7, so bring a plotter, an E6B (a paper one is fine and free apps exist), and the sectional.



G7 · Cross-country planning, performance, and weight and balance

G7**Cross-country planning, performance, and weight and balance**

Ground + S12 · 3.0 hr + 60 min sim

OBJECTIVE

Plan a VFR cross-country from scratch: route, checkpoints, courses and headings with wind correction, times and fuel with reserves, altitudes, airspace, weather, NOTAMs, takeoff and landing performance, and weight and balance, then fly the first leg in the simulator by pilotage and dead reckoning.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.I.D Cross-Country Flight Planning
- PA.I.F Performance and Limitations
- PA.VI.A Pilotage and Dead Reckoning
- PA.VI.B Navigation Systems and Radar Services (introduction)

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 16 - Navigation	pilotage, dead reckoning, the E6B wind triangle, flight log, VOR and GPS basics, lost procedures
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 10 - Weight and Balance and Chapter 11 - Aircraft Performance	compute both for the planned flight using the POH charts
<u>Pilot's Operating Handbook (your airplane)</u> C172S POH/AFM	Sections 5 and 6	takeoff, climb, cruise, landing charts; the CG envelope
<u>Federal Aviation Regulations</u> 14 CFR	<u>91.103</u> (preflight action), <u>91.151</u> (VFR fuel reserves), <u>91.159</u> (VFR cruising altitudes), <u>91.121</u> (altimeter settings)	
<u>Aeronautical Information Manual</u> AIM	<u>5-1-1</u> through <u>5-1-4</u> (preflight, briefings, flight plans), <u>4-1-15</u> through <u>4-1-20</u> (radar services, flight following)	
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	I.D, I.F, VI.A, VI.B	

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S12 - First navigation leg. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. Plan a 40-60 nm leg to a nearby airport on the sectional with three checkpoints, compute headings and times for the sim's wind (set Custom winds aloft to match your plan, e.g. 270 at 15 at 3,000 ft). Fly it by pilotage and dead reckoning only: no GPS, no autopilot. Log actual time over each checkpoint against your plan. Open and close a flight plan with the built-in ATC and request flight following.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Build the navigation log for a real 100-nm round trip you will fly in F13: checkpoints every 10-15 nm, true course, variation, deviation, wind correction, groundspeed, leg times, fuel to the tenth of a gallon with the 91.151 reserve plus your own.

- 2 Weight and balance for the actual flight with your instructor's weight and the fuel load; takeoff and landing distance at forecast temperature; density altitude.
- 3 The flight plan form, VFR flight plan filing, flight following, and the lost-communications and diversion mindset.

COMPLETION STANDARDS

- A complete navigation log, weight and balance, and performance computation that the instructor can find no error in.
- S12 flown with checkpoints hit within 2 minutes of plan.

COMMON ERRORS

- Planning checkpoints that cannot be seen from the air.
- Fuel planned to minimums with no margin for a diversion.
- Forgetting to compute the density altitude for a summer afternoon.

BEFORE THE NEXT LESSON

Read for G8 and re-fly S12 if you were more than 3 minutes off at any checkpoint.





Aeromedical factors and human factors

Ground · 1.5 hr

OBJECTIVE

Recognize hypoxia, hyperventilation, carbon monoxide poisoning, spatial disorientation, motion sickness, dehydration, fatigue, and the effects of alcohol and medication; know the rules and your own limits.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.I.H Human Factors

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 17 - Aeromedical Factors	all sections
<u>Aeronautical Information Manual</u> AIM	Chapter 8 - Medical Facts for Pilots (<u>8-1-1</u> through <u>8-1-8</u>)	
<u>Federal Aviation Regulations</u> 14 CFR	<u>91.17</u> (alcohol), <u>91.211</u> (oxygen), <u>61.53</u> (operations during medical deficiency)	
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	I.H	

3 · WHAT WE WILL DO IN THE LESSON

- 1 Each condition: what causes it, the symptoms you will notice first, and the action; the illusions in flight (leans, somatogravic, false horizon, runway width and slope illusions).
- 2 Alcohol and drugs: the 8-hour rule vs. your own, the FAA medication list, and the aeromedical examiner as a resource.
- 3 Night vision and its 30-minute adaptation, in preparation for the night lesson.

COMPLETION STANDARDS

- Answer the ACS I.H Knowledge elements without notes.
- Explain the 'over-the-counter' medication decision process.

COMMON ERRORS

- Assuming you would notice hypoxia.

BEFORE THE NEXT LESSON

Read for F13. Fly S13: the full round trip you planned in G7.



C2 · FAA knowledge test (the written)

C2

FAA knowledge test (the written)

Check · 2.5 hr test

OBJECTIVE

Pass the Private Pilot Airplane knowledge test at an approved testing center with a score you are not embarrassed by, so that the oral exam begins with the examiner's confidence.

1 · WHAT IS REQUIRED (ACS / FAR)

- 61.35, 61.103(d), 61.105

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	Appendix: Knowledge Test Description and Eligibility; the ACS codes you will see on your test report	
<u>FAA testing resources</u> faa.gov	Airman Knowledge Testing Supplement for Sport Pilot, Recreational Pilot, and Private Pilot (FAA-CT-8080-2, free PDF on faa.gov)	the charts and figures used on the test; practice with the real supplement
<u>FAA testing resources</u> faa.gov	Sample questions for the PAR test on faa.gov/training_testing/testing/	
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapters 1-17	review the chapters you scored lowest on in practice tests

3 · WHAT WE WILL DO IN THE LESSON

- 1 Endorsement for the knowledge test (61.35 / AC 61-65K) after a practice test at 90 percent or better.
- 2 Take the test; bring the report to the next lesson so the missed ACS codes can be reviewed before the oral (the examiner will ask about them).

COMPLETION STANDARDS

- Passing score is 70 percent. Aim for 90.

COMMON ERRORS

- Taking the test before the instructor signs off in order to 'get it out of the way' and then re-learning it for the oral.

BEFORE THE NEXT LESSON

Read for F13 and fly S13. With the written behind you, every airplane hour from here is flying, not ground school at airplane rates.

**F13****Dual cross-country #1**

Flight + S13 · 2.5 hr flight, 90 min sim

OBJECTIVE

Fly the cross-country you planned in G7 with the instructor: pilotage and dead reckoning, checkpoint timing, radio work with approach control and a towered destination, flight following, and a diversion demonstration.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.VI.A Pilotage and Dead Reckoning
- PA.VI.B Navigation Systems and Radar Services
- PA.VI.C Diversion (introduction)
- PA.III.A and III.B at an unfamiliar airport

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 16 - Navigation (diversion, lost procedures)	review
<u>Aeronautical Information Manual</u> AIM	<u>4-1-15</u> (radar traffic information service / flight following), <u>4-3-2</u> (towered airport operations), <u>5-1-4</u> (flight plan)	
<u>FAA charts and Chart Supplement</u> faa.gov digital products	Chart Supplement entries for the destination and one alternate	brief the diagrams

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S13 - The whole trip. Fly the entire G7 round trip in the sim with the planned winds, flight plan opened with ATC, flight following requested, the destination arrival with ATIS and tower calls, and the return. Time every checkpoint.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Full flight with you navigating and communicating; the instructor demonstrates one diversion to an alternate mid-route and one 'lost' recovery using the sectional and VOR/GPS.
- 2 Arrival at an unfamiliar towered airport, a full-stop landing, taxi by diagram, and departure.

COMPLETION STANDARDS

- ACS VI.A: checkpoints identified, on course within 3 nm, altitude within 200 ft, ETA within 5 minutes; VI.B: correct use of the navigation system and radar services.

COMMON ERRORS

- Heads-down on the chart at the expense of the scan.
- Not writing down the ATIS, the clearance, or the time over each checkpoint.

BEFORE THE NEXT LESSON

Plan and fly S14 for the long cross-country in F14 (a different destination, over 100 nm each way).



F14 · Dual cross-country #2 (long), diversion and lost procedures

F14

Dual cross-country #2 (long), diversion and lost procedures

Flight + S14 · 3.0 hr flight, 90 min sim

OBJECTIVE

Complete a longer cross-country with a mid-route diversion you plan in the air, a simulated lost procedure, and a landing at a non-towered field with correct CTAF procedures.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.VI.C Diversion
- PA.VI.D Lost Procedures
- PA.VI.A/B
- PA.III.B at a non-towered airport

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25C	Chapter 16 (diversion and lost procedures)	
Advisory Circular AC	90-66C Non-Towered Airport Flight Operations	the whole circular
Aeronautical Information Manual AIM	4-1-9 (traffic advisory practices at non-towered airports), 6-3-2 (lost, the 'four Cs': climb, communicate, confess, comply)	

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S14 - Long trip with a diversion. Plan a 100-nm-plus leg. Halfway, without warning (have someone pick the moment), divert to a different airport: turn toward it immediately, estimate the heading and distance on the chart with a thumb and the plotter, compute the time and fuel, and fly it. Land at a non-towered airport announcing on CTAF.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Long leg with flight following; the instructor calls a diversion and you plan and fly it in the air; a simulated lost situation resolved with the sectional and navigation aids.
- 2 Non-towered arrival and departure with correct CTAF calls, pattern entry at 45 degrees to downwind, and a full stop.

COMPLETION STANDARDS

- ACS VI.C: divert promptly, select an appropriate airport, estimate heading, distance, time, and fuel within reason, fly the diversion within 3 nm and 200 ft. VI.D: correct lost procedure sequence.

COMMON ERRORS

- Continuing on course for two minutes while deciding.
- Announcing on the wrong CTAF frequency because the Chart Supplement was not checked.

BEFORE THE NEXT LESSON

Read for F15 and fly S15 (night). Night flying in the sim is genuinely useful for lighting recognition.



F15 · Night flight: preparation, pattern work, and ten full-stop landings

F15**Night flight: preparation, pattern work, and ten full-stop landings**

Flight + S15 · 1.5 hr flight, 45 min sim

OBJECTIVE

Begin the 61.109(a)(2) night requirement: night preparation, airport lighting, night vision and illusions, and the ten full-stop night takeoffs and landings at an airport, flown as pattern work.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.XI.A Night Preparation (Knowledge and Risk elements)
- PA.IV.A/B at night

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Airplane Flying Handbook</u> FAA-H-8083-3C	Chapter 11 - Night Operations	night vision, lighting, preparation, taxi, takeoff, approach and landing at night, emergencies at night
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 17 (night vision) and Chapter 14 (airport lighting)	
<u>Aeronautical Information Manual</u> AIM	<u>2-1-1</u> through <u>2-1-10</u> (airport lighting), <u>4-3-23</u> (use of aircraft lights)	
<u>Federal Aviation Regulations</u> 14 CFR	<u>61.57</u> (b) (night currency), <u>91.209</u> (aircraft lights), <u>91.205</u> (c) (night equipment)	
<u>Private Pilot Airman Certification Standards</u> FAA-S-ACS-6C	XI.A	

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S15 - Night pattern. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 22:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. Taxi with the airport diagram using taxiway lights (blue) and runway lights (white, with the color changes at the end); fly six patterns using the PAPI on every approach; practice a black-hole approach at an airport with no surrounding lights and note how it fools the eye.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Night preflight and lighting check; taxi; patterns with attention to the illusions (black hole, runway lighting intensity, autokinesis).
- 2 Ten full-stop takeoffs and landings at night, each flown to the PAPI; the instructor logs the count (61.109(a)(2)(ii)).

COMPLETION STANDARDS

- ACS XI.A Knowledge and Risk elements answered; night landings to the same IV.B standard; ten full-stop landings logged.

COMMON ERRORS

- Descending below the PAPI at night.
- Forgetting the flashlight, the second flashlight, and the red lens.

BEFORE THE NEXT LESSON

Plan the night cross-country for F16 (more than 100 nm total distance) and fly the route in the simulator at night.



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F16 · Night cross-country (more than 100 nm)

F16**Night cross-country (more than 100 nm)**

Flight · 2.0 hr flight

OBJECTIVE

Complete the 61.109(a)(2) night requirement with a dual night cross-country of more than 100 nautical miles total distance, flown by pilotage on lit checkpoints and navigation aids, with a diversion decision made in the dark.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.XI.A Night Preparation
- PA.VI.A Pilotage and Dead Reckoning
- PA.VI.B Navigation Systems and Radar Services
- PA.IV.A/B at night

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Airplane Flying Handbook</u> FAA-H-8083-3C	Chapter 11 - Night Operations (en route and emergencies)	fuel, weather, and diversion planning at night
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 16 - Navigation	review the plan and the checkpoints you chose
<u>Aeronautical Information Manual</u> AIM	<u>5-1-1</u> (preflight), <u>4-1-20</u> (transponder), <u>4-3-23</u> (aircraft lights)	
<u>Federal Aviation Regulations</u> 14 CFR	<u>61.109</u> (a)(2)(i), <u>91.151</u> (night VFR fuel reserve: 45 minutes)	

3 · WHAT WE WILL DO IN THE LESSON

- 1 Full cross-country planning with the night fuel reserve; flight following requested; at least one leg flown by pilotage on lit checkpoints, one by navigation aid.
- 2 A diversion or 'lost' drill at night, including a call to the nearest facility.
- 3 A night landing at an unfamiliar airport.

COMPLETION STANDARDS

- 61.109(a)(2)(i) met: more than 100 nm total distance, dual, at night; navigation to ACS VI.A/B standards; fuel reserve planned and confirmed.

COMMON ERRORS

- Under-planning the fuel reserve at night.
- Trusting a single checkpoint you cannot positively identify.

BEFORE THE NEXT LESSON

Read for F17 and fly S16.

**F17****Instrument time, radio navigation, and radar services**

Flight + S16 · 2.0 hr flight (at least 1.7 under the hood), 60 min sim

OBJECTIVE

Complete the 3 hours of instrument training with an emphasis on navigating with VOR and GPS under the hood and using ATC radar services, so that an inadvertent IMC encounter ends with a controlled turn and a request for help.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.VIII.F Radio Communications, Navigation Systems/Facilities, and Radar Services
- PA.VIII.A-E review
- PA.VI.B

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Pilot's Handbook of Aeronautical Knowledge</u> FAA-H-8083-25C	Chapter 16 - Navigation (VOR, GPS, radar services)	
<u>Aeronautical Information Manual</u> AIM	<u>1-1-3</u> through <u>1-1-17</u> (VOR, DME, GPS), <u>4-1-15</u> through <u>4-1-20</u> (radar services), <u>6-4-1</u> (two-way radio failure)	
<u>Instrument Flying Handbook</u> FAA-H-8083-15B	Chapters 4, 5 and 7 (review)	

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S16 - Radio navigation under the hood. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. with overcast 300 ft. Climb into cloud, track a VOR radial to the station and outbound, intercept and track a course to a fix, then request vectors to a VFR airport from FSX ATC and follow them to a breakout at 1,000 ft. Practice the phraseology of declaring an emergency and asking for vectors to VFR conditions.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Under the hood: VOR tracking and intercepts, GPS direct-to, and ATC-provided vectors and altitudes; unusual attitude review.
- 2 The inadvertent-IMC drill: level the wings on instruments, 180-degree standard-rate turn, climb if terrain requires, squawk 7700, tell ATC.

COMPLETION STANDARDS

- ACS VIII.F: use the navigation system and radar services correctly, maintain altitude within 200 ft, heading within 20 degrees, airspeed within 10 knots.

COMMON ERRORS

- Not asking ATC for help early enough.

BEFORE THE NEXT LESSON

Study for the 61.93 solo cross-country endorsement: plan the F18 flight completely and fly S17 (the whole route).



F18 · Solo cross-country #1

F18**Solo cross-country #1**

Solo + S17 · 2.5 hr solo, 60 min sim

OBJECTIVE

Plan and fly a solo cross-country of at least 50 nm one way under the 61.93 endorsement, with a full navigation log, weather briefing, and flight following.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.VI.A/B solo
- 61.93 endorsements
- 61.109(a)(5)(i) solo cross-country time

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Federal Aviation Regulations 14 CFR	61.93 (solo cross-country requirements and endorsements)	
Advisory Circular AC	61-65 (the specific cross-country endorsement for this flight)	

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S17 - Rehearse the exact route with today's forecast winds, including the arrival and departure at the destination.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Instructor reviews your plan, weather, and NOTAMs, endorses the flight, and you fly it. Full-stop landing at the destination, then home.
- 2 Post-flight: actual vs. planned times and fuel; what you would change.

COMPLETION STANDARDS

- Planned vs. actual within 5 minutes per leg; fuel within 2 gallons of plan; all radio work unassisted.

COMMON ERRORS

- Departing without calling the instructor for the final weather go/no-go.

BEFORE THE NEXT LESSON

Plan the 150-nm solo cross-country for F19: three points, one leg over 50 nm straight-line, full-stop landings at each.



F19 · Solo cross-country #2 (the 150-nm flight)

F19**Solo cross-country #2 (the 150-nm flight)**

Solo + S18 · 3.0 hr solo, 90 min sim

OBJECTIVE

Complete the 61.109(a)(5)(ii) long solo cross-country: 150 nm total, full-stop landings at three points, one segment more than 50 nm straight-line.

1 · WHAT IS REQUIRED (ACS / FAR)

- 61.109(a)(5)(ii)
- PA.VI.A/B/C solo

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Federal Aviation Regulations 14 CFR	61.109(a)(5) , 61.93	confirm your route meets every word of the rule before you plan it
FAA charts and Chart Supplement faa.gov digital products	Chart Supplement for all three airports; airport diagrams printed	

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S18 - The whole 150-nm route with three landings, in the sim, with forecast winds.

3b · WHAT WE WILL DO IN THE LESSON

- 1 The flight, alone, exactly as planned and endorsed; a call to the instructor from each stop.

COMPLETION STANDARDS

- Meets 61.109(a)(5)(ii) as logged; all landings full stop; navigation within tolerance.

COMMON ERRORS

- Pressing on into deteriorating weather because turning back feels like failure. Turning back is the skill.

BEFORE THE NEXT LESSON

Plan F20: three full-stop landings at a towered airport, solo.



F20 · Solo towered-airport landings and remaining solo time

F20

Solo towered-airport landings and remaining solo time

Solo · 2.5 hr solo

OBJECTIVE

Complete the three solo full-stop landings at an airport with an operating control tower (61.109(a)(5)(iii)) and the balance of the 10 hours of solo time.

1 · WHAT IS REQUIRED (ACS / FAR)

- 61.109(a)(5)(iii)
- PA.III.A/B solo at a towered airport
- Authorization: your current 61.87(n) solo endorsement (AC 61-65K A.6, or A.7 after 90 days); if the towered airport is not your home field and is within 25 nm, a 61.93(b)(1) endorsement for that airport (A.8); 61.95 only if it is Class B. Not 61.94, which applies to sport and recreational students.

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Aeronautical Information Manual AIM	4-3-2 (towered airport operations), 4-3-13 (light signals), 4-3-14 (communications)	review

3 · WHAT WE WILL DO IN THE LESSON

- 1 Three full-stop taxi-back landings at a towered airport, each involving a flight in the pattern, with correct clearance readbacks and taxi instructions.

COMPLETION STANDARDS

- Logged per the rule; no deviations from clearances.

COMMON ERRORS

- Reading back 'roger' instead of the runway assignment.

BEFORE THE NEXT LESSON

Read for F21. Short and soft fields begin the checkride-prep stage.



THE LESSONS

Stage 3 - Checkride preparation

The remaining ACS tasks, everything polished to standard, a mock oral and a mock checkride, and the endorsements. The goal is a checkride with no surprises.

F21 · Short-field and soft-field takeoffs and landings

F21

Short-field and soft-field takeoffs and landings

Flight + S19 · 1.3 hr flight, 45 min sim

OBJECTIVE

Perform maximum-performance takeoffs and landings on short and soft fields to ACS standards, using the POH technique and speeds.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.IV.C Soft-Field Takeoff and Climb
- PA.IV.D Soft-Field Approach and Landing
- PA.IV.E Short-Field Takeoff and Maximum Performance Climb
- PA.IV.F Short-Field Approach and Landing

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Airplane Flying Handbook FAA-H-8083-3C	Chapter 6 (short-field and soft-field takeoffs) and Chapter 9 (short-field and soft-field approaches and landings)	
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Section 4 (short-field takeoff flaps 10, 56 KIAS at 50 ft; short-field landing 61 KIAS flaps 30) and Section 5 (distances)	compute today's distances
Private Pilot Airman Certification Standards FAA-S-ACS-6C	IV.C through IV.F	the touchdown-zone standards: short-field within 200 ft beyond the point

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S19 - Short and soft. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. Short-field takeoff: flaps 10, brakes held, full power, release, rotate 51-55, climb 56 KIAS to 50 ft then Vy. Short-field landing: 61 KIAS flaps 30, aim point, touchdown with minimal float, flaps up and maximum braking. Soft-field: yoke full aft to start, lift the nose early, accelerate in ground effect; landing with power through the flare, nose held off. Ten of each.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Each of the four maneuvers demonstrated and practiced to standard; the performance chart numbers compared with what actually happened.

COMPLETION STANDARDS

- ACS IV.E/F: short-field takeoff at the POH speed plus 10 / minus 5, obstacle clearance; short-field landing touchdown within 200 ft beyond a specified point. IV.C/D: soft-field technique with the nose wheel held off and no side drift.

COMMON ERRORS



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- Short-field landing with excess speed and a long float.
- Soft-field takeoff with the nose too high and the airplane stalling out of ground effect.

BEFORE THE NEXT LESSON

Read for F22 and fly S20.



F22 · Steep turns and the forward slip to ACS standards

F22

Steep turns and the forward slip to ACS standards

Flight + S20 · 1.2 hr flight, 30 min sim

OBJECTIVE

Fly 45-degree steep turns to the ACS standard and a forward slip to a landing without flaps or with partial flaps as the POH allows.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.V.A Steep Turns
- PA.IV.M Forward Slip to a Landing

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Airplane Flying Handbook FAA-H-8083-3C	Chapter 10 - Performance Maneuvers (steep turns) and Chapter 9 (intentional slips)	
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Section 4 (slips with flaps extended note for the 172)	

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S20 - Steep turns. Simulator: Cessna 172 Skyhawk with the steam-gauge panel, your home airport, clear weather, wind calm, 10:00 local, realism at true-to-life settings, crash detection on. Profiles are written for Microsoft Flight Simulator 2024 (Appendix C); Appendix B translates every menu name for MSFS 2020 and Appendix A for the older FSX, kept as a legacy option. At 3,500 ft AGL: clearing turns, then 360-degree turns at 45 degrees of bank each direction, adding about 100 rpm and back pressure entering, holding altitude within 100 ft and rolling out within 10 degrees of the entry heading. Then three approaches in a forward slip from 1,000 ft AGL to a landing.

3b · WHAT WE WILL DO IN THE LESSON

- 1 Steep turns both directions to the standard; forward slips to a landing with the airplane straight before touchdown.

COMPLETION STANDARDS

- ACS V.A: 45 degrees plus or minus 5, altitude within 100 ft, airspeed within 10 knots, rollout within 10 degrees. IV.M: slip with the longitudinal axis aligned before touchdown, touchdown within 400 ft beyond the point.

COMMON ERRORS

- Losing altitude in the second half of the turn from not adding back pressure.
- Slipping with the airspeed indication trusted; it reads wrong in a slip.

BEFORE THE NEXT LESSON

Study for C2, the knowledge test. Use the ACS appendix and the free FAA sample questions and testing supplement.

**F23****Maneuvers review to ACS standards**

Flight + S21 · 1.5 hr flight, 45 min sim

OBJECTIVE

Fly every checkride maneuver in the order and to the tolerances of the ACS, with the instructor grading as an examiner would.

1 · WHAT IS REQUIRED (ACS / FAR)

- Areas IV, V, VII, VIII, IX

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Private Pilot Airman Certification Standards FAA-S-ACS-6C	Areas IV, V, VII, VIII, IX Skill elements	make a one-page card of the tolerances and carry it

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S21 - Fly the maneuver sequence: steep turns, slow flight, power-off stall, power-on stall, emergency descent, engine failure, unusual attitudes, then the four landings (normal, crosswind, short, soft) and a go-around.

3b · WHAT WE WILL DO IN THE LESSON

- 1 A checkride-order flight with the instructor silent except to grade. Any task below standard is repeated on the next flight.

COMPLETION STANDARDS

- Every task within ACS tolerance; self-assessment matches the instructor's.

COMMON ERRORS

- Flying tentatively because you are being graded; fly it like you own it.

BEFORE THE NEXT LESSON

Read for F24 and fly S10 again.

**F24****Emergency operations drill and systems review**

Flight · 1.3 hr

OBJECTIVE

Handle every emergency in the ACS from memory items through checklist, and answer the systems questions the examiner will ask about the airplane.

1 · WHAT IS REQUIRED (ACS / FAR)

- PA.IX.A through IX.D
- PA.I.G

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Pilot's Operating Handbook (your airplane) C172S POH/AFM	Section 3 (all) and Section 7 (all)	
Airplane Flying Handbook FAA-H-8083-3C	Chapter 18	review

3 · WHAT WE WILL DO IN THE LESSON

- 1 Simulated engine failure at altitude, after takeoff, and in the pattern; emergency descent; electrical failure; simulated fire; carb ice or induction icing; pitot-static failure; an off-airport landing decision; emergency equipment.

COMPLETION STANDARDS

- ACS IX standards; memory items instant; checklists completed.

COMMON ERRORS

- Talking through the emergency instead of flying it.

BEFORE THE NEXT LESSON

Prepare for C3, the mock oral. Plan a cross-country to the destination your instructor assigns, exactly as you will for the real ride.



C3 · Mock oral exam

C3

Mock oral exam

Check · 2.5 hr ground

OBJECTIVE

Sit a full oral exam with a different instructor using the ACS, with your planned cross-country, weather, and the airplane's documents, and fix every weak area before the real one.

1 · WHAT IS REQUIRED (ACS / FAR)

- ACS Area I (all tasks) and the Knowledge and Risk elements of Areas II-XII

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Private Pilot Airman Certification Standards FAA-S-ACS-6C	All Knowledge and Risk Management elements	
ACS Companion Guide for Pilots faa.gov	the section on how the oral is conducted	
PHAK, AFH, AIM, CFR	everything assigned in G1-G8	review by ACS task, not by book

3 · WHAT WE WILL DO IN THE LESSON

- 1 Full oral: certificates and documents, airworthiness, the planned cross-country (weather, airspace, performance, weight and balance, fuel), systems, aeromedical, night, emergencies, and risk management scenarios.
- 2 Written list of weak areas and an assignment for each.

COMPLETION STANDARDS

- Every ACS Knowledge element answered correctly; every Risk element answered with a decision, not a shrug.

COMMON ERRORS

- Answering with a mnemonic instead of an explanation.

BEFORE THE NEXT LESSON

Fly S22 (the full checkride flight profile) before F25.



F25 · Mock checkride flight

F25**Mock checkride flight**

Flight + S22 · 2.0 hr flight, 60 min sim

OBJECTIVE

Fly the complete practical test flight with a different instructor as the examiner: departure on the planned cross-country, a diversion, maneuvers, emergencies, hood work, and the landings, graded task by task.

1 · WHAT IS REQUIRED (ACS / FAR)

- All ACS Skill elements

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Private Pilot Airman Certification Standards FAA-S-ACS-6C	All tasks	

3a · SIMULATOR PROFILE (FLY AT HOME FIRST)

S22 - The checkride flight: depart on the planned cross-country, two checkpoints, divert, steep turns, slow flight, stalls, emergency descent, engine failure, hood work with unusual attitudes, return for the four landings and a go-around.

3b · WHAT WE WILL DO IN THE LESSON

- 1 The mock ride, graded; a written list of any task not to standard, each of which is repeated in F26.

COMPLETION STANDARDS

- Pass on every task by the check instructor's grading.

COMMON ERRORS

- Letting one weak task ruin the next one; each task is separate, reset your mind between them.

BEFORE THE NEXT LESSON

Repeat any deficient tasks in F26; confirm the 61.109(a)(4) three hours within two calendar months are logged.

**F26****Final polish and endorsements**

Flight + ground · 1.5 hr flight, 1.0 hr ground

OBJECTIVE

Correct anything from the mock checkride, confirm every hour and endorsement, complete the IACRA application, and brief the checkride day.

1 · WHAT IS REQUIRED (ACS / FAR)

- 61.39 (prerequisites for the practical test), 61.109 (hours), AC 61-65K endorsements

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
<u>Federal Aviation Regulations</u> 14 CFR	<u>61.39</u> , <u>61.109</u> , <u>61.45</u> (practical test aircraft)	
<u>Advisory Circular</u> AC	61-65 (practical test endorsement)	

3 · WHAT WE WILL DO IN THE LESSON

- 1 Any tasks from F25 flown again to standard; the logbook audited line by line against 61.109; the IACRA application submitted; the practical test endorsement given; the checkride day briefed (what to bring, timeline, the DPE's fee, the plan for weather).

COMPLETION STANDARDS

- Logbook and IACRA complete and correct; instructor's endorsement given.

COMMON ERRORS

- Discovering the night cross-country was 98 nm the week of the checkride. Audit early.

BEFORE THE NEXT LESSON

Rest. Plan the checkride cross-country when the examiner assigns it, usually the day before.



C4 · The practical test: oral exam and flight

C4

The practical test: oral exam and flight

Checkride · Half a day

OBJECTIVE

Earn the Private Pilot certificate.

1 · WHAT IS REQUIRED (ACS / FAR)

- Every ACS task

2 · STUDY BEFORE YOU ARRIVE

Book	Where	What to get out of it
Private Pilot Airman Certification Standards FAA-S-ACS-6C	The whole document, one more time	

3 · WHAT WE WILL DO IN THE LESSON

- 1 Oral exam per the ACS, then the flight. If a task is not to standard the DPE will tell you; the rest of the ride can usually continue and only the failed task is retested.
- 2 After the temporary certificate: 61.113 privileges and limitations, 61.56 flight review every 24 months, 61.57 currency for passengers (3 takeoffs and landings in 90 days, full stop at night), and the personal minimums sheet you will keep raising and lowering for the rest of your flying life.

COMPLETION STANDARDS

- A temporary airman certificate.

COMMON ERRORS

- Forgetting that the certificate is a license to keep learning.

BEFORE THE NEXT LESSON

Take a friend flying. Read the Instrument Rating ACS; that is where the next syllabus starts.



APPENDIX A

Appendix A - Home simulator setup: Microsoft Flight Simulator X (Steam Edition)

Three simulators are covered in this syllabus. FSX (this appendix) is old, cheap, and runs on almost any Windows PC. Microsoft Flight Simulator 2020 (Appendix B) and 2024 (Appendix C) are the current versions, with real-world weather, photo-realistic scenery, and a far better Cessna 172, but they need a capable PC (or an Xbox) and a fast internet connection. All three ship a steam-gauge 172, and every simulator profile in this syllabus works in all three. Pick the one you can run; the procedures are identical. Mac users: X-Plane 12 runs natively on macOS; the Microsoft simulators do not.

A1. Buying and installing (Steam)

- 1 Go to store.steampowered.com and create a free Steam account. Download and install the Steam client for Windows.
- 2 In the Steam store search for 'Microsoft Flight Simulator X: Steam Edition'. It is usually \$25 or less and frequently on sale. Buy it.
- 3 Library, then Install. It is about 15 GB; allow an hour on a normal connection.
- 4 First launch: let it finish building its scenery index (a one-time wait). Set the screen resolution to your monitor's native resolution in Options, Settings, Display.
- 5 Optional but recommended: the free FSX kneeboard already contains the C172SP checklist and reference speeds (Shift+F10 in flight).

A2. Hardware: what you need and what you don't

- 1 Minimum: any joystick with a throttle slider. Better: a yoke with a throttle quadrant. Best for this syllabus: yoke, quadrant, and rudder pedals with toe brakes, because taxiing, crosswinds, and coordinated turns are half of what the sim is for.
- 2 Typical entry-level sets from Logitech (formerly Saitek), Honeycomb, or Thrustmaster are fine. You do not need a 'pro' yoke; you need the axes to be smooth and repeatable.
- 3 Plug everything in before you start the simulator. In Windows, open 'Set up USB game controllers' (type `joy.cpl` in the Start menu), select each device, Properties, and confirm every axis moves through its full range. If an axis is jumpy or does not reach the ends, run the device's calibration there first.



A3. Assigning the control axes in FSX

- 1 In FSX: Options, Settings, Controls, then the Control Axes tab. At the top, pick the device you are assigning (the yoke, then the quadrant, then the pedals).
- 2 For each axis in the list, select it, click Change Assignment, and move the physical control you want to use. Assign: Ailerons axis = yoke left/right; Elevator axis = yoke forward/back; Throttle axis = the throttle lever (for a quadrant use Engine 1 throttle); Mixture axis = the red lever if you have one (otherwise leave mixture on the keyboard and set Auto-mixture on in Realism); Rudder axis = pedals; Left brake axis and Right brake axis = the toe brakes.
- 3 Check the Reverse box for any axis that moves the wrong way (many throttle sliders and some pedal sets are reversed by default).
- 4 Sensitivity and null zone (the Calibration tab): sensitivity about 50 to 70 percent, null zone as small as it can be without the controls creeping when your hands are off. Test in flight; adjust once and then leave it alone so your muscle memory is consistent.

A4. Assigning buttons and keys

- 1 Controls, Buttons/Keys tab. Assign the yoke's buttons to the things you touch every pattern: Flaps extend incrementally (default key F7), Flaps retract incrementally (F6), Elevator trim up (Num 1) and down (Num 7) on the rocker or hat if you have one, Brakes (period) on a button if you have no toe brakes, and the View: look left / right / rear on the hat switch.
- 2 Keyboard defaults worth memorizing for the 172: Throttle full F4, throttle cut F1, increase F3, decrease F2 · Flaps up F5, down one notch F7, up one notch F6, full F8 · Parking brake Ctrl+period · Brakes period · Trim nose up Num 1, nose down Num 7 · Magnetos M then +/- · Mixture rich Ctrl+Shift+F4, idle cutoff Ctrl+Shift+F1 · Carburetor heat H (not fitted on the fuel-injected 172SP, but useful in older 172 add-ons) · Pitot heat Shift+H · Landing lights Ctrl+L, all lights L · Kneeboard Shift+F10 · Pause P · Cycle views S, cycle instrument panel views A · ATC window (the tilde key) · Reset view Ctrl+Space.
- 3 Print a card with the keys you assigned and tape it to the desk; do not learn the sim's keyboard and the airplane's checklist at the same time.



A5. Setting up a training flight (Free Flight)

- 1 From the main menu choose Free Flight.
- 2 Current aircraft, Change: filter by manufacturer Cessna and select the C172SP Skyhawk. Choose the variant with the standard (steam-gauge) panel for every lesson in this syllabus; the G1000 version comes later in your career.
- 3 Current location, Change: type your home airport's identifier (for example KLEX). Choose a starting position: a specific runway ('Runway 22') to start on the runway with the engine running, or a parking spot/ramp/gate to start on the ramp. FSX always loads with the engine running, see A6 for cold and dark.
- 4 Current weather, Change: choose the 'Clear skies' theme for all early lessons. For wind lessons choose User-defined weather and set the surface wind speed and direction (the syllabus tells you the numbers). For instrument lessons set an overcast layer with a low base and reduce visibility.
- 5 Current time and season, Change: set the local time (10:00 for day lessons, 22:00 for the night profile) and any season.
- 6 Fuel and payload (Aircraft menu, Fuel and Payload): set the fuel you computed in your weight and balance and your own weight in the pilot seat. Yes, the sim honors weight and balance; use it.
- 7 Click Fly Now. Before touching anything, pause (P), open the kneeboard (Shift+F10), and read the checklist you are about to use.

A6. Saving a cold-and-dark start

- 1 Load a Free Flight at a parking spot with the engine running. Shut the airplane down exactly as the POH says: throttle idle, mixture idle cutoff (Ctrl+Shift+F1) and wait for the engine to stop, magnetos off (M then minus until OFF), all lights and avionics off, master switch off (open the panel and click it, or use the keyboard toggle for the battery master), parking brake set.
- 2 Flights menu, Save Flight. Name it '172 cold and dark [your airport]'. From then on, Free Flight, Load, pick that saved flight, and every S-profile starts with a real engine start by checklist.

A7. Realism settings that matter

- 1 Options, Settings, Realism. Flight model: General, P-factor, torque, gyro drift, and crash tolerance sliders to the right (realistic). Crash detection: on. Ignore crashes: off. Unlimited fuel: off. Auto-rudder: off if you have pedals, on if you do not. Auto-mixture: on unless you assigned a mixture axis. G-effects: off (it is a visual gimmick). Failures: off until lesson S10, when you can set a random engine failure.
- 2 Options, Settings, Traffic: set airline and general aviation traffic to 20-30 percent so there are airplanes in the pattern to look for and to hear on the radio.
- 3 Use the built-in ATC panel (MSFS 2024: the ATC toolbar item; FSX: the tilde key). It is simplified but its phraseology is close to real, and the habit of talking before you do things is the point. Request 'closed traffic' or 'touch and go' from the tower menu for pattern work; request flight following from the departure/center menu on cross-countries.



A8. Honesty about what the simulator can and cannot do

- 1 It cannot be logged toward the 40 hours (it is not an FAA-approved training device) and it will not teach you the feel of the controls, the seat-of-the-pants cues, or a real flare.
- 2 It is excellent for: checklists and flows, engine start and run-up, taxiing by the airport diagram, power settings and pitch attitudes, the traffic pattern's geometry and configuration changes, radio calls, instrument scan and unusual attitudes, VOR and GPS navigation, cross-country timing, night lighting recognition, and emergency memory items. Those are also the things that eat the most airplane time when they are learned in the airplane.
- 3 Fly every S-profile with the same discipline as a real flight: checklist in hand, calls out loud, a written debrief. Sloppy sim practice teaches sloppy habits at 60 dollars an hour instead of 200; it is still a bad deal.

**APPENDIX B**

Appendix B - Home simulator setup: Microsoft Flight Simulator (2020)

Microsoft Flight Simulator (2020) is the version most people own today. It streams scenery from the internet, so it needs a steady connection and a reasonably modern gaming PC or an Xbox Series X|S. It is included with PC Game Pass and Xbox Game Pass, which is the cheapest way to try it. One detail that matters for this syllabus: the glass-cockpit Cessna 172 (G1000) is in every edition, but the steam-gauge Cessna 172 is only in the Deluxe edition and above. Game Pass gives you the Standard edition, so plan on the Deluxe upgrade (or use the G1000 172 and learn the six-pack later; the procedures are the same).

B1. Buying and installing

- 1 Buy it on Steam, the Microsoft Store, or the Xbox app, or subscribe to PC Game Pass. The Deluxe edition (or the Deluxe upgrade for Game Pass users) adds the steam-gauge 172 this syllabus uses.
- 2 Install size: the base download is large (well over 100 GB with content), and the installer downloads most of it after the first launch. Start it before bed.
- 3 First launch: let the content manager finish, then Options, General Options, Graphics: pick the preset your PC can hold at a steady frame rate (Medium is fine; smooth beats pretty for training). Set the resolution to your monitor's native resolution.
- 4 Options, General Options, Data: turn on Photogrammetry, Bing data world graphics, and Live Real-World Air Traffic if your connection allows; turn on Rolling Cache if your internet is slow.

B2. Hardware

- 1 Same advice as FSX: a joystick with a throttle at minimum, a yoke and throttle quadrant is better, rudder pedals with toe brakes make taxiing, crosswinds, and coordination real. Xbox users need a console-compatible yoke (Turtle Beach VelocityOne or Thrustmaster TCA are common) because a game controller cannot fly a lesson.
- 2 MSFS ships ready-made profiles for most popular hardware: plug it in before launching and the simulator will usually recognize it. Always open the profile and verify every axis and button before your first lesson; defaults are close, not always right.



B3. Assigning the control axes

- 1 Options, Controls Options. Each connected device shows as a tab across the top: click your yoke first.
- 2 Set the filter (left side) to All so you can see unassigned actions, then use the search box. Search AILERONS AXIS and assign the yoke's roll; ELEVATOR AXIS and assign pitch; THROTTLE AXIS (or THROTTLE 1 AXIS) to the throttle lever; MIXTURE AXIS (or MIXTURE 1 AXIS) to the red lever if you have one; on the pedals tab, RUDDER AXIS to the pedals and LEFT BRAKE AXIS and RIGHT BRAKE AXIS to the toe brakes.
- 3 To assign, click the action, click the input box, move the physical control, then Validate. Use the Reverse axis toggle for any control that moves the wrong way; throttle sliders and some pedal sets are commonly reversed.
- 4 Click Sensitivity (bottom of the Controls screen) for the selected device: set a small dead zone on each axis so the airplane does not creep with your hands off, and leave the sensitivity curves near linear (0 to slightly negative) so a real airplane does not feel twitchy by comparison.

B4. Assigning buttons and the keys worth memorizing

- 1 Same screen, same search box. Put on your yoke's buttons: FLAPS UP (decrease) and FLAPS DOWN (increase), ELEVATOR TRIM UP and ELEVATOR TRIM DOWN on a rocker, TOGGLE PARKING BRAKE, and the hat switch on COCKPIT LOOK actions (usually pre-assigned). If you have no toe brakes, assign BRAKES to a button.
- 2 Keyboard defaults (search the action name in Controls Options to confirm on your version): flaps F5 (full up), F6 (one notch up), F7 (one notch down), F8 (full down); elevator trim nose down Num 7, nose up Num 1; brakes Num Del (the period on the numeric keypad); parking brake Ctrl+Num Del; mixture Ctrl+Shift+F1 (idle cutoff) through Ctrl+Shift+F4 (full rich); throttle F1 to F4; landing lights Ctrl+L; toggle cockpit / external view End; drone camera Insert; pause menu Esc; active pause Pause.
- 3 Magnetos, master, avionics, fuel selector, carb heat and pitot heat are easier to click in the 3D cockpit than to memorize as keys; hover and click. The Checklist panel (below) highlights each control for you.



B5. Setting up a training flight (World Map)

- 1 Main menu, World Map. Top-left, Aircraft Selection: choose Cessna 172 Skyhawk. There are two: the G1000 version and the one with steam gauges (Deluxe and above). Use the steam-gauge airplane for this syllabus.
- 2 Departure: search your airport identifier (for example KLEX). Click it and choose a starting point. Choosing a runway starts you on the runway with the engine running, ready for takeoff. Choosing a parking spot, ramp, or gate starts you cold and dark: no need to save a special flight as in FSX. Use parking for every profile that begins with an engine start.
- 3 Leave the arrival blank for pattern work and maneuvers. For cross-country profiles set the arrival airport and choose VFR in the flight plan type so the sim files a VFR flight plan you can open and close with ATC.
- 4 Weather and Time (top-right panel): pick the Clear Skies preset for early lessons. For wind lessons choose Custom, set the surface wind speed and direction the profile calls for, and leave the clouds clear. For the instrument profiles choose Overcast or Custom with a low cloud base and reduced visibility. Set the local time with the time slider: 10:00 for day lessons, 22:00 for the night profile. Live Weather is superb later; for training you want the weather the lesson specifies.
- 5 Fly. Once in the cockpit, open the toolbar (move the mouse to the top of the screen) and pin the Checklist, ATC, VFR Map, and Weight and Balance panels. Use the Weight and Balance panel to set the fuel and payload from your weight-and-balance computation; it draws your point on the CG envelope, which is a superb way to check your own math.

B6. The Checklist panel: use it, then stop using it

- 1 Toolbar, Checklist. It contains the manufacturer-style checklist for the 172, item by item. Click the eye icon on an item and the sim highlights the exact control in the cockpit. This is the best tool in the simulator for learning flows.
- 2 For the first two or three sessions, work through Before Start, Engine Start, Before Taxi, Run-Up, Before Takeoff with the highlighter on. Then turn the highlighter off and read from the POH checklist on your kneeboard, exactly as you will in the airplane. Never turn on Auto-complete; it does the checklist for you, which is the opposite of the point.

B7. Assistance settings (the realism sliders)

- 1 Options, Assistance Options. Select the True to Life preset; it turns off every assist. Then confirm: Piloting, Auto-rudder Off (On only if you have no pedals), Assisted takeoff/landing Off, AI piloting Off; Aircraft Systems, Unlimited fuel Off, Automixture as you prefer (Off if you assigned a mixture axis); Failure and Damage, Crash damage On, Aircraft stress damage On, Engine stress damage On; Notification, keep Checklist assistance Off; User experience, the Landing/Taxi ribbon Off.
- 2 Options, General Options, Traffic: set Generic traffic and Airport vehicles to moderate levels so there is something to look for in the pattern.
- 3 Failures for the engine-failure profiles (S10): in the World Map, click the aircraft, then Failures, and set an engine failure after a delay or at random.

B8. ATC in MSFS 2020

- 1 Toolbar, ATC. The menu offers the same kind of simplified but realistic phraseology as FSX: request taxi, request takeoff with the option of remaining in the pattern, touch and go, full stop, flight following, and IFR services you will not use yet. Say every call out loud before you click it; the click is just the transmit key.



Appendix C - Home simulator setup: Microsoft Flight Simulator 2024

Microsoft Flight Simulator 2024 (released November 2024) is the current version. It streams almost everything, so the local install is small but the internet connection matters more than ever; it runs on PC (Steam, Microsoft Store, PC Game Pass) and Xbox Series X|S. For this syllabus the good news is that the steam-gauge Cessna 172S is in the Standard edition; the G1000 version is in Deluxe and above. Menus were reorganized from 2020 and are still being updated, so if a menu name here has moved, search for the action or setting by name.

C1. Buying, installing, and the first launch

- 1 Buy on Steam, the Microsoft Store, or the Xbox app, or use PC Game Pass (Standard edition, which includes the steam-gauge 172S). The base install is roughly a tenth of 2020's because content streams on demand; a wired connection or strong Wi-Fi of 50 Mbps or better makes it usable, and the first flight at a new airport takes a minute while scenery streams.
- 2 Options, General, Graphics: choose the preset that holds a steady frame rate; Options, General, Data: enable the streaming and rolling-cache options so the areas you fly most are stored locally.
- 3 The main menu offers Career, Challenges, and Free Flight. Everything in this syllabus is Free Flight. Career mode is entertaining but it grades you against game rules, not the ACS; save it for after the checkride.

C2. Hardware

- 1 Same guidance as the other two simulators: yoke, throttle, and pedals with toe brakes if you can. MSFS 2024 recognizes the same popular devices with built-in profiles, and Xbox users need a console-compatible yoke. Plug everything in before launching, then verify every assignment.

C3. Controls: axes and buttons

- 1 Options, Controls. Devices appear as tabs; pick the yoke, set the filter to All, and search the same action names as 2020: AILERONS AXIS, ELEVATOR AXIS, THROTTLE AXIS, MIXTURE AXIS, RUDDER AXIS, LEFT BRAKE AXIS, RIGHT BRAKE AXIS. Click the input box, move the control, Validate. Reverse any axis that moves the wrong way.
- 2 Sensitivity and dead zones are under the Sensitivity button for each device, as in 2020: small dead zone, near-linear curve.
- 3 Buttons: FLAPS UP / FLAPS DOWN, ELEVATOR TRIM UP / DOWN, TOGGLE PARKING BRAKE, and the hat for looking. The keyboard defaults are largely unchanged from 2020 (F5-F8 flaps, Num 7 and Num 1 trim, Num Del brakes, Ctrl+Num Del parking brake, F1-F4 throttle, Ctrl+Shift+F1-F4 mixture, End to toggle the outside view). When in doubt, search the action name in Controls; the default key is shown beside it.



C4. Setting up a training flight (Free Flight)

- 1 Free Flight opens the world map. Choose the aircraft: Cessna 172 Skyhawk; select the steam-gauge variant (Standard edition) for this syllabus. The livery and the optional tail number are cosmetic; set the tail number to your school's airplane if you like, it makes the radio calls feel real.
- 2 Departure: your airport identifier. MSFS 2024 lets you pick the starting position (runway, parking, ramp) and also the aircraft state: Cold and Dark, Ready to Taxi, or Ready for Takeoff. For every profile that begins with a start-up, choose a parking spot and Cold and Dark. For pattern-only sessions, a runway and Ready for Takeoff saves time.
- 3 Weather and time: presets (Clear Skies, Few Clouds, Scattered, Broken, Overcast, Rain, Storm) or Custom with wind layers, cloud layers, and visibility; a time-of-day slider. Use the exact conditions each profile specifies. Live weather and live time are for later.
- 4 Fuel and payload: set them from your weight-and-balance computation before you fly. In 2024 this lives in the aircraft settings on the world map and in the EFB tablet in the cockpit, which also shows the CG envelope.

C5. The EFB tablet and the toolbar

- 1 MSFS 2024 adds an electronic flight bag tablet in the cockpit with apps for checklists, the map, weather, aircraft settings and failures, and ATC. Its checklist app works like the 2020 Checklist panel: item by item, with a highlighter that points to the control. Use it with the highlighter for the first sessions, then switch to your paper POH checklist. Do not use any auto-complete function.
- 2 The toolbar at the top of the screen still offers ATC, the VFR map, weather, and camera panels if you prefer them to the tablet.

C6. Assistance settings

- 1 Options, Assistance: choose the True to Life preset, then confirm the same items as 2020: auto-rudder off (unless you have no pedals), AI piloting off, assisted checklists off, unlimited fuel off, crash and stress damage on, landing and taxi ribbons off, and no flight-model simplification. The airplane should be able to hurt you in the simulator so that you take it seriously.
- 2 Failures for S10: set an engine failure from the aircraft settings or the EFB before the flight.

C7. ATC in MSFS 2024

- 1 ATC is offered through the EFB and the toolbar with the same menu style: taxi, takeoff with the option to remain in the pattern, touch and go, full stop, flight following. The phraseology is simplified but recognizably real. Say the call before you click it. If your PC can handle it, the online networks VATSIM and PilotEdge provide real human controllers using real phraseology; PilotEdge in particular is built for training and is worth its monthly fee once you are comfortable with the basics.



TRANSLATION TABLE

Simulator translation table: profiles are written in Microsoft Flight Simulator 2024 terms

Every simulator profile in the lessons uses Microsoft Flight Simulator 2024 menu names; this table translates them for MSFS 2020 and FSX. Here is the equivalent in the two newer simulators.

In the lesson (FSX)	MSFS 2020	MSFS 2024
Free Flight, choose aircraft	World Map, Aircraft Selection	Free Flight world map, aircraft selection
Cessna C172SP Skyhawk (steam-gauge panel)	Cessna 172 Skyhawk with steam gauges (Deluxe edition and up); G1000 version in all editions	Cessna 172S Skyhawk steam gauges (Standard edition); G1000 version in Deluxe and up
Start on the runway (engine running)	Departure: choose a runway	Departure: runway, aircraft state Ready for Takeoff
Load the saved cold-and-dark flight	Departure: choose a parking spot, ramp, or gate (starts cold and dark automatically)	Departure: parking spot with aircraft state Cold and Dark
Weather: Clear skies theme	Weather and Time panel: Clear Skies preset	Weather: Clear Skies preset
Weather: User-defined, set surface wind	Weather: Custom, set wind layer speed and direction	Weather: Custom, wind layers
Weather: overcast 300-500 ft, 1 mile visibility	Weather: Custom, add a cloud layer with a low base and reduce visibility (or Overcast preset and lower the base)	Weather: Custom or Overcast preset, low cloud base, reduced visibility
Time and season: 10:00 or 22:00 local	Weather and Time panel: time slider	Time slider on the Free Flight setup
Settings, Realism sliders	Options, Assistance Options: True to Life preset	Options, Assistance: True to Life preset
Settings, Failures (random engine failure)	World Map: click the aircraft, Failures	Aircraft settings or EFB: Failures
Aircraft, Fuel and Payload	Toolbar: Weight and Balance panel (shows the CG envelope)	Aircraft settings on the map or the EFB Weight and Balance app
Kneeboard checklist (Shift+F10)	Toolbar: Checklist panel (highlighter on, auto-complete off)	EFB tablet: Checklist app (highlighter on, auto-complete off)
ATC window (tilde key)	Toolbar: ATC panel	EFB ATC app or toolbar ATC panel
Views: S to cycle, hat to look	End toggles cockpit/external, Insert for the drone camera, hat to look	Same as 2020



APPENDIX D

Study locator: every chapter of every book

Use this with the ACS: find the task, read its References line, then find the chapter here.

Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25C)

Pages are numbered chapter-page (e.g. 5-12). Download the whole book or single chapters from the PHAK page on faa.gov.

- 1 Introduction to Flying
- 2 Aeronautical Decision-Making
- 3 Aircraft Construction
- 4 Principles of Flight
- 5 Aerodynamics of Flight
- 6 Flight Controls
- 7 Aircraft Systems
- 8 Flight Instruments
- 9 Flight Manuals and Other Documents
- 10 Weight and Balance
- 11 Aircraft Performance
- 12 Weather Theory
- 13 Aviation Weather Services
- 14 Airport Operations
- 15 Airspace
- 16 Navigation
- 17 Aeromedical Factors
- Appendix and Glossary

Airplane Flying Handbook (FAA-H-8083-3C)

Same chapter-page numbering. The chapters you need for the Private certificate are 1-11 and 18.

- 1 Introduction to Flight Training
- 2 Ground Operations
- 3 Basic Flight Maneuvers
- 4 Energy Management: Mastering Altitude and Airspeed Control
- 5 Maintaining Aircraft Control: Upset Prevention and Recovery Training
- 6 Takeoffs and Departure Climbs
- 7 Ground Reference Maneuvers
- 8 Airport Traffic Patterns
- 9 Approaches and Landings
- 10 Performance Maneuvers
- 11 Night Operations
- 12-17 Transition chapters (complex, multiengine, tailwheel, turboprop, jet, light sport): later in your career
- 18 Emergency Procedures



Aeronautical Information Manual (AIM)

Cited chapter-section-paragraph. Read online at faa.gov; the online version is always current.

- 1 Air Navigation (navaids: VOR, DME, GPS)
- 2 Aeronautical Lighting and Other Airport Visual Aids
- 3 Airspace
- 4 Air Traffic Control (services, radio communications, airport operations, ATC clearances)
- 5 Air Traffic Procedures (preflight, departure, en route, arrival, pilot/controller roles)
- 6 Emergency Procedures
- 7 Safety of Flight (meteorology, altimeter settings, wake turbulence, bird hazards, potential hazards, accident reporting)
- 8 Medical Facts for Pilots
- 9 Aeronautical Charts and Related Publications
- 10 Helicopter Operations (not applicable)
- Pilot/Controller Glossary

14 CFR (the FARs) on eCFR

Always cite the section, e.g. 91.155. The eCFR text is the official current text.

- Part 1 Definitions and abbreviations
- Part 43 Maintenance (43.3, 43.7, Appendix A preventive maintenance)
- Part 61 Certification of pilots (Subpart C student pilots 61.81-61.95; Subpart E private pilots 61.102-61.117; 61.3, 61.23, 61.35, 61.39, 61.51 logbooks, 61.56 flight review, 61.57 recent experience)
- Part 67 Medical standards and certification
- Part 68 BasicMed
- Part 71 Airspace designations
- Part 91 General operating and flight rules (Subpart A general, B flight rules 91.101-91.159, C equipment 91.203-91.227, E maintenance 91.401-91.417)
- 49 CFR Part 830 NTSB notification and reporting of accidents

Private Pilot ACS (FAA-S-ACS-6C)

Areas of Operation are Roman numerals, Tasks are letters. Each task lists References, Objective, Knowledge (K), Risk Management (R), and Skills (S).

- I Preflight Preparation (A Pilot Qualifications, B Airworthiness Requirements, C Weather Information, D Cross-Country Flight Planning, E National Airspace System, F Performance and Limitations, G Operation of Systems, H Human Factors)
- II Preflight Procedures (A Preflight Assessment, B Flight Deck Management, C Engine Starting, D Taxiing, F Before Takeoff Check)
- III Airport and Seaplane Base Operations (A Communications, Light Signals, and Runway Lighting Systems, B Traffic Patterns)
- IV Takeoffs, Landings, and Go-Arounds (A Normal Takeoff and Climb, B Normal Approach and Landing, C Soft-Field Takeoff and Climb, D Soft-Field Approach and Landing, E Short-Field Takeoff and Maximum Performance Climb, F Short-Field Approach and Landing, M Forward Slip to a Landing, N Go-Around/Rejected Landing)
- V Performance and Ground Reference Maneuvers (A Steep Turns, B Ground Reference Maneuvers)
- VI Navigation (A Pilotage and Dead Reckoning, B Navigation Systems and Radar Services, C Diversion, D Lost Procedures)
- VII Slow Flight and Stalls (A Maneuvering During Slow Flight, B Power-Off Stalls, C Power-On Stalls, D Spin Awareness)
- VIII Basic Instrument Maneuvers (A Straight-and-Level Flight, B Constant Airspeed Climbs, C Constant Airspeed Descents, D Turns to Headings, E Recovery from Unusual Flight Attitudes, F Radio Communications, Navigation Systems/Facilities, and Radar Services)
- IX Emergency Operations (A Emergency Descent, B Emergency Approach and Landing (Simulated), C Systems and Equipment Malfunctions, D Emergency Equipment and Survival Gear)
- X Multiengine Operations (not applicable to the single-engine certificate)
- XI Night Operations (A Night Preparation)
- XII Postflight Procedures (A After Landing, Parking and Securing)
- Appendices: knowledge test description, practical test instructions, tolerances, and the ACS codes



TERMS USED IN THIS SYLLABUS

Glossary

ACS

Airman Certification Standards. The FAA document that defines every task on the checkride and the references for it.

ADM

Aeronautical decision-making. The FAA's name for the systematic way pilots make decisions; tested on every ACS task as 'risk management'.

AGL / MSL

Height above ground level / altitude above mean sea level. Pattern altitudes are stated AGL and flown MSL.

CTAF

Common traffic advisory frequency, used to announce your position at a non-towered airport.

DPE

Designated pilot examiner. A private individual authorized by the FAA to give the practical test.

Endorsement

A dated, signed logbook entry by your instructor certifying you are ready for a specific privilege or test. Wording comes from AC 61-65K.

IACRA

The FAA's online application system for certificates; used for your student pilot certificate and the checkride application.

IMSAFE / PAVE / 3P

Personal-fitness checklist (Illness, Medication, Stress, Alcohol, Fatigue, Emotion) / flight-risk checklist (Pilot, Aircraft, environment, External pressures) / the risk process (Perceive, Process, Perform).

KIAS

Knots indicated airspeed. Every speed in this syllabus is KIAS unless it says otherwise.

POH / AFM

Pilot's Operating Handbook / Airplane Flight Manual. The book for your specific airplane; Section 2 limitations and Section 3 emergencies are memorized.

Stabilized approach

By 500 ft AGL (VFR): configured, on speed, on glide path, aimed at the touchdown point, in trim, with only small corrections needed. Otherwise: go around.



Vy / Vx / Va / Vfe / Vno / Vne / Vs

Best rate of climb / best angle of climb / maneuvering / max flap extended / max structural cruising / never exceed / stall speeds. For the 172S: 74 / 62 / 105 (at 2,550 lb) / 110 (10 degrees) and 85 (full) / 129 / 163 / 48 clean and 40 landing configuration.

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Revision history

The edition on every page footer tells you which version you are holding. When a regulation, the ACS, or a handbook edition changes, or a reader or instructor finds an error, the book is corrected and the change is recorded here, so a student and an instructor working from different printings can see exactly what differs. Report errors to hello@pilotcareersolutions.com.

Edition	Date	What changed
1.0	September 2026	First edition. Thirty-seven lessons in four stages, Cessna 172S steam-gauge numbers, simulator profiles, the free FAA library, and the fillable workbook.
1.1	September 18, 2026	Pre-solo coverage completed against 14 CFR 61.87(d): a forward slip to a landing is flown and logged in F7 and checked in C1; collision, windshear, and wake-turbulence avoidance are logged in F6; steep turns are introduced in F5. Hours reconciled to 14 CFR 61.109(a): solo time is 10.0 (F12 printed as 0.5 dual and 1.5 solo), dual instrument time 3.0, and the night requirement split into F15 (ten full-stop landings) and F16 (a cross-country of more than 100 nm). The sequence is now 38 lessons; later flight lessons are F17 to F26. The knowledge test (C2) moved ahead of the cross-country stage. Front matter states that the lessons flown once total about 45 hours and that a student should plan 55 to 65. AC 61-65K (November 14, 2025) replaces AC 61-65J throughout. Simulator profiles are written for Microsoft Flight Simulator 2024, with FSX kept as a legacy appendix. A paragraph added on substituting POH values for other airplanes and G1000 panels. Workbook: cover statement that it is a training record, not a logbook; an endorsement register keyed to the regulations with AC 61-65K Appendix A template numbers; N-number and Hobbs/tach fields on every sheet; lesson-coded form fields; radio cards revised (self-announce on upwind and crosswind at non-towered airports, 7600 for radio failure, 7700 for an emergency only).
1.2	September 26, 2026	Corrections after an independent review of the printed books. Instrument Flying Handbook citations corrected to the chapters of FAA-H-8083-15B (Chapter 3 Flight Instruments, Chapter 4 Airplane Attitude Instrument Flying, Chapter 5 Basic Flight Maneuvers, Chapter 7 Navigation Systems) in the free FAA library table, in F10 and F17, and on the workbook sheets for both. F10 now prints 1.5 hours of flight with at least 1.3 under the hood, so the instrument time shows on paper: F10 1.3 and F17 1.7 make the 3.0 of 14 CFR 61.109(a)(3). 91.413 (the transponder test, every 24 calendar months) added to the G3 inspection list beside 91.409 and 91.207. The FSX failures menu is Aircraft > Failures, corrected on the S10 card. Noted for the next edition: the solo plan totals exactly the 10.0-hour minimum of 61.109(a)(5); fly F20 to 3.0 for a tenth of margin.
1.3	September 27, 2026	Second round of corrections from the independent review. Simulator weather on the lesson cards uses the Microsoft Flight Simulator name, Custom (User-defined is the FSX name, kept in Appendix A and the translation table). Lost-procedure cite corrected to AIM 6-3-2 (6-2-2 is transponder emergency operation) in F14 and on the workbook sheet; the radio card points to the four Cs. Aviation Weather Handbook cited as FAA-H-8083-28B (April 2026). The Study Locator is on page 79, not in an appendix. The blank lesson plan's log reads a cross-country of more than 100 nm and 60 to 75 hours to the checkride. Noted for the full rebuild: solo (10.0) and hood (3.0) sit exactly on the 61.109 minimums, so a shortened flight needs an added lesson; three radio cards (line-up-and-wait and hold-short readbacks, Mayday) are queued.

PASS IT ON

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