

////// **2023** ////

CFI BOOKLET - PPL SYLLABUS



FLIGHT TRAINING DONE RIGHT

Welcome to the FLY8MA CFI Booklet!

How to use this CFI Booklet

We have a lot on our plates as CFIs. This booklet will act as your assistant while you teach soon-to-be Private Pilots. While the PPL Lesson Plans provide a general guide for you and your student, this CFI Booklet is chock-full of nitty gritty details that you won't want to forget. We suggest using this document on the ground for preparation, and printing off the Lesson Plan for in-flight use.

What's the meaning of it all?

Our **Grading Scale** is a simple three bubble system. This allows you to quickly grade your student while keeping your eyes and attention on the task at hand.

For example:

○○○ Pre/Postflight Procedures ✍️

If the student performs this task **unsatisfactory**, or is incomplete, the CFI will mark the first (far left) bubble. Repeat this task during the next lesson.

If the student performs this task **satisfactory**, the CFI will mark the first two bubbles (left and middle). Revisit this task prior to their checkride.

If the student performs this task **proficiently** (meaning they are ready for their PPL Checkride), the CFI will mark all three bubbles.

**Solo Lessons: The SP will grade themselves after flight (on the ground during debrief).*

**Prior to the student's PPL Checkride, each item in the syllabus must have all three bubbles marked.*

For example:

●○○ Pre/Postflight Procedures ✍️

In the example above, the student has shown satisfactory Pre/Postflight Procedures. To be considered checkride-ready, the student will need to have all three circles filled out.

Instructor & Student Actions

Next to each Ground and Flight Task, we have specified the **level of instructor & student action** by propeller symbols.



Level 1 — IP do and tell



Level 2 — IP tell and SP do



Level 3 — SP do and tell

Referring to the examples on this page, you'll notice "Pre/Postflight Procedures" has a *Level 1 Propeller*. The IP will demonstrate this new task while describing verbally to the SP.

Equipment Required

A student's learning style can vary between aural, visual, kinaesthetic, or a combination of these. Before starting lessons with a new student, simply ask, "How do you study? Do you better absorb information through reading, podcasts, videos...?" This will give you a good idea on how to approach subsequent lessons (especially ground instruction).

While teaching Ground Tasks, we suggest using the following resources to assist in explanation:

- Dry erase board / notepad
- Model aircraft with movable control surfaces
- Paper charts (maps, A/FD, AD), related manuals
- Wind tunnel simulator app
- Poster of aircraft cockpit/panel
- FAR/AIM

Scenario-based training (SBT):

Aircraft accidents really happen for one reason: **poor pilot decisions**. As for the 1% of accidents that are not caused by a pilot's decision (i.e. an engine failure), the decisions the pilot makes immediately after the unexpected event will dictate the outcome of the situation (good or bad).

Thus, we must teach our students *HOW* to make good decisions in aviation. We call this **effective ADM** (aeronautical decision-making).

The best way to do this is to teach through scenarios. Basic skills must still be taught at a rote level first (i.e. straight and level flight). After the basics are mastered, custom crafted scenarios mimicing real-world flying will help the student develop their ADM.

ADM comes from a scenario where the student is forced to **apply** several smaller bits of knowledge to solve a more complex problem. The smaller bits of knowledge are the basics (think four fundamentals of flight, or a go-around). The application of several tasks comes from a well-formulated scenario.

Our goal here for the student is **correlation**:

Can a student combine skills A+B+C to create something they have not seen before, or deal with a situation they have not been thoroughly briefed on?

Crafting a well-rounded scenario:



KEEP IT REAL — An engine running 150RPM lower than normal on the TO roll due to a broken cable or carb heat knob sticking out is realistic.

A 15KT tailwind + rough-running engine + failed ASI *all on the TO roll* is not an effective scenario. Simply put, if the scenario is not realistic the student will think it's dumb and not pay attention.



THE SURPRISE FACTOR — The scenario's "problem" must be something the SP is unfamiliar with. Here's why:

While they have not rehearsed the exact scenario, they have already accomplished the skills needed to solve it. *For example*, you taught a ground lesson a couple days ago on the audio panel and radio troubleshooting. In today's flight lesson, you turn the radio's volume down while the student is distracted in the practice area. You then let the student figure out why the radio is not working when they try to retrieve the ATIS/AWOS returning to the airport.



WE NEED A CHALLENGE — The student should have to call on 3-5 individual skills to deal with the situation. If it's as simple as the window popping open during run-up, minimal skills are needed to solve the problem.

If the window pops open while initiating the TO roll, the SP must quickly analyze the situation + maintain positive directional control + chose to maintain full power (or reduce to idle, stopping on remaining RWY)... *Or*, worst-case scenario: reach over to close the window while fumbling through some combination of the above steps.

Scenarios should challenge the student without "breaking" them.

If your scenarios never cause the student to "break," they are likely too easy. If the student often fails to find a safe solution or "breaks" because the scenarios are too difficult, you must start with smaller steps (work up to bigger ones).

STAGE 1

Page	Lessons	Ground	Dual Flight Training					Solo Flight	
			Day Local	Day XC	Night Local	Night XC	Instrument	Day Local	Day XC
7, 8	1: PPL Certificate & Flight Fundamentals	1.0	1.2	-	-	-	-	-	-
9, 10	2: Aircraft Control & Configuration Changes	1.0	1.5	-	-	-	-	-	-
11, 12	3: Energy Management	1.0	1.5	-	-	-	0.2	-	-
13, 14	4: Stalls & Wind Correction	1.0	1.5	-	-	-	-	-	-
15, 16	5: Ground Reference & Multitasking	1.0	1.7	-	-	-	-	-	-
17, 18	6: Instrument Flight & Emergency Procedures	1.0	1.7	-	-	-	0.3	-	-
19, 20	7: Preflight Planning & Towered Airports	1.0	1.7	-	-	-	-	-	-
21, 22	8: Flight Environment & Emergency Procedures	1.0	1.5	-	-	-	-	-	-
23, 24	9: Energy Management in the Traffic Pattern	1.0	1.3	-	-	-	-	-	-
25, 26	10: Advanced Traffic Pattern	1.0	1.5	-	-	-	-	-	-
27	11: Traffic Pattern EPs	1.0	1.3	-	-	-	-	-	-
28	12: Performance Takeoffs & Landings	1.0	1.5	-	-	-	-	-	-
29, 30	13: Simulated Instrument & Unusual Attitudes	1.0	1.2	-	-	-	0.5	-	-
31, 32	14: Day-to-Night Transition	1.0	0.2	-	1.2	-	-	-	-
33, 34	15: Stage 1 Check	1.0	1.5	-	-	-	0.2	-	-
Stage 1 Hour Totals:		15.0	20.8	-	1.2	-	1.2	-	-

NOTES:

- The Stage 1 Check must be completed prior to SP solo flight.
- The IP reserves ability to repeat lessons if a student needs more time to aid progression.
- The Fly8MA Private Pilot Syllabus prepares a student for checkride in 60 hours (incl. 10 hours solo, 3.0 night (of which 1.8 is XC), 4.1 dual cross country, 5.0 solo cross country and 3.0 simulated instrument).

STAGE 2

Page	Lessons	Dual Flight Training					Solo Flight		
		Ground	Day Local	Day XC	Night Local	Night XC	Instrument	Day Local	Day XC
35	16: First Solo—Pattern	2.0	0.7	-	-	-	-	0.5	-
36, 37	17: Second Solo (Pattern) + Maneuver Review	2.0	1.0	-	-	-	-	0.5	-
38	18: Unaccompanied Pattern Solo	2.0	-	-	-	-	-	1.0	-
39	19: Local Area Solo	2.0	0.7	-	-	-	-	1.0	-
40	20: Principles of Navigation	1.0	1.3	-	-	-	-	-	-
41, 42	21: XC Flight Emergency Procedures	1.0	1.3	-	-	-	-	-	-
43, 44	22: XC Flight Planning	1.0	1.8	-	-	-	-	-	-
45	23: VORs + Maneuver Review	1.0	1.5	-	-	-	-	-	-
46	24: Local Area Solo	2.0	-	-	-	-	-	1.0	-
47	25: Advanced Navigational Systems	1.0	1.5	-	-	-	0.3	-	-
48	26: Local Area or Pattern Solo <i>*OPTIONAL*</i>	2.0*	-	-	-	-	-	1.0*	-
49	27: First Dual XC Flight	1.5	-	1.8	-	-	0.4	-	-
50	28: Unfamiliar Airport Traffic Pattern Ops	1.0	1.7	-	-	-	-	-	-
51	29: Local Area Solo <i>*OPTIONAL*</i>	2.0*	-	-	-	-	-	1.0*	-
52	30: Night XC Flight	1.5	-	-	-	1.8	-	-	-
53, 54	31: Long Dual XC Flight	1.5	-	2.3	-	-	0.4	-	-
55, 56	32: Stage 2 Check	1.5	2.0	-	-	-	0.3	-	-
Stage 2 Hour Totals:		22.0	13.5	4.1	-	1.8	1.4	4.0	-

NOTES:

- The Stage 2 Check must be completed prior to SP solo flight.
- The IP reserves ability to repeat lessons if a student needs more time to aid progression.
- The Fly8MA Private Pilot Syllabus prepares a student for checkride in 60 hours (incl. 10 hours solo, 3.0 night (of which 1.8 is XC), 4.1 dual cross country, 5.0 solo cross country and 3.0 simulated instrument).

*Hours marked with an “ * ” are optional, and are not included in *Stage 2 Hour Totals* or *Syllabi Hour Totals*.



STAGE 3

Page	Lessons	Ground	Dual Flight Training					Solo Flight	
			Day Local	Day XC	Night Local	Night XC	Instrument	Day Local	Day XC
57	33: First Solo XC Flight	2.0	-	-	-	-	-	-	2.0
58	34: Emergency Procedures & Pattern Work	1.0	1.5	-	-	-	-	-	-
59	35: Second Solo XC Flight	2.0	-	-	-	-	-	-	3.0
60	36: Maneuver Review	1.0	1.5	-	-	-	-	-	-
61, 62	37: Mock PPL Checkride	1.5	1.8	-	-	-	0.2	-	-
63	38: Local Area Solo	2.0	-	-	-	-	-	1.0	-
64	39: Student Progress Evaluation	1.0	1.8	-	-	-	-	-	-
65, 66	40: Stage 3 Check	1.5	2.0	-	-	-	0.2	-	-
Stage 3 Hour Totals:		12.0	8.6	-	-	-	0.4	1.0	5.0

NOTES:

- The Stage 3 Check must be completed prior to SP solo flight.
- The IP reserves ability to repeat lessons if a student needs more time to aid progression.
- The Fly8MA Private Pilot Syllabus prepares a student for checkride in 60 hours (incl. 10 hours solo, 3.0 night (of which 1.8 is XC), 4.1 dual cross country, 5.0 solo cross country and 3.0 simulated instrument).

Hours marked with an “” are optional, and are not included in Stage 2 Hour Totals or Syllabi Hour Totals.



REQUIREMENTS

14 CFR § 61.109

TOTAL: 40 hrs, incl. the following...

WITH INSTRUCTOR (“DUAL”): 20 hrs, incl. the following...

- **3 hrs** practical test prep (within preceding 2 months of checkride)
- **3 hrs** night flight, incl. one XC of +100NM total distance & 10 TO/LDs (full-stop)
- **3 hrs** cross country flight training
- **3 hrs** instrument flight training

SOLO FLIGHT: 10 hrs, incl. the following...

- **5 hrs** solo XC time (+ one solo XC flight of 150NM total distance, full-stop LDs at three points, and one segment of +50NM between TO and LD)
- **3 TO/LDs** to full-stop (each landing involving a flight in the traffic pattern at airport w/operating control tower)



LESSON 1

PPL Certificate & Flight Fundamentals

Ground Lesson 1.0 / Flight Lesson 1.2

Ground Tasks

Preparations & expectations pursuing a PPL

- Training guidelines (i.e. how to study outside of lessons, scheduling procedures, syllabus)
- Explain Grading Scale (Page 2 of this Booklet)
- PPL Requirements—Minimum 40hr vs. 60hr Syllabus; Medical (We suggest scheduling this ASAP to avoid delays and disqualifying medical conditions before they get too far in!)

Aviation Terminology

- The FAA—Who are they, and what is their purpose?
- Language of Aviation: introduce basic verbiage incl. Go/No-Go, PHAK, AFH, FAR/AIM, WX (weather), MX (maintenance) and PAX (passengers)
- Reference: FAA's Contractions Publication

Risk Mitigation & Safety Procedures

- Pre-Flight Risk Mitigation: Self-assessment (IMSAFE) and other factors (PAVE)
- Basic SRM/ADM Example: "Our local airspace is very busy today. How do we stay ahead of the airplane?" Introduce task management, checklist usage, etc.

Flying Fundamentals & Flight Controls

- Straight-and-Level, Climbs, Descents, Turns
- Four Forces of Flight
- Review flight control terms, 3 Axes of Flight: pitch, roll, yaw, ailerons, rudder, elevator, flaps, trim

Basic Engine Controls

- Throttle, Mixture, Carb Heat, Propeller Control (if equipped)

Aircraft Familiarization & Walkaround

- Checklists—importance and use in/out of the aircraft (study guide during chair flying, practicing flows)
- Terms: ARROW, POH, fuselage, empennage, fuel types/contamination/sumping, Hobbs/Tach time
- Discuss Propeller, Master/Mags hazards
- Cockpit familiarization: While the student sits in the left seat, show them where to place their hands and feet on the controls. As they move the controls, instruct them to look outside to see their direct inputs visually!
- During the Walkaround, look for: fraying or gunk on aileron cables through flap hinge; bird nests; lightning holes on horizontal stabilizer, secure safety wires, etc.
- Positive exchange of flight controls
- PAX Brief: remain clear of controls, motion sickness mitigation (sick sack location), exit/emergency procedures, sterile cockpit (especially during radio transmissions), looking for other AC
- Last Call—Conduct one last 360° Walkaround to ensure all chocks/tie-downs/tow bars/covers have been removed; fuel/engine oil caps are secure; you didn't miss anything during the preflight! While you do this, also do one last flight control check (move all control surfaces to ensure no resistance and listen for unusual noises).



Flight Tasks

Checklist Usage

- Properly securing checklist during flight
- To minimize head-down time, hold the checklist up to your dashboard and take a look around inbetween each item (with your thumb as a placeholder).

Engine Operation

- ENG start, warm-up, run-up
- Briefly discuss ENG gauges (OT, OP, etc.)

Positive Exchange of Flight Controls

- Reaffirm student can conduct 3-way exchange of controls in-flight

Radio Communications

- Proper phraseology of numbers, altitudes and phonetic alphabet

The 4 W's of Radio Communication

W Who you're calling

W Who you are (tail number)

W Where you are

W What you want (request)

Taxi & RWY Incursion Avoidance Procedures

- IP will demo initial taxi to RWY for departure
- Writing taxi clearance to avoid expectation bias
- Importance of Brake Check prior to taxi
- Use of power, rudder, brakes during taxi (+ ideal speed; acting as a defensive driver)
- Call outs ("Clear left, clear right") while crossing other intersections/RWYs
- Identify Hold-Short Line
- SP will taxi (post-flight) when cleared of RWY to ramp

Collision Avoidance

- Introduce scanning techniques
- If possible, cover up instruments—this will help keep SP's eyes outside

Takeoff & Departure Procedures

Area Familiarization (Landmark Navigation)

- Point out familiar landmarks, roads, etc.

Straight-and-Level Flight

- Horizon line reference, power management
- Reinforce relaxed grip on yoke w/one hand, the other poised for throttle adjustment if necessary

Turns (Both Directions)

- Look outside at flight controls to see direct visual

Climbs & Descents

- Power management, pitch changes (again, look outside for direct visual)

Approach & Landing Procedures

- Obtain inbound WX
- Maintaining situational awareness (Aviate-Navigate-Communicate)

Parking & Securing Aircraft

- Checklist, checklist, checklist!

LESSON 2

Aircraft Control & Configuration Changes

Ground Lesson 1.0 / Flight Lesson 1.5

Scenario:

Your friend is in town and would like to go on a short scenic flight.

Home Airport METAR: SPECI KLSE 160312Z AUTO 03007KT 10SM -RA OVC030 16/11 A3008

Home Airport TAF: 160000Z 1600/1706 03010G15KT 9999 VCSH FEW030 BKN080 A2998
TEMPO 1602/1604 9000 -SHRA

Ground Tasks

Weather Reports

- METARs, TAFs (content, release & validity times)
- ATIS vs. AWOS/ASOS (content, update times)
- Practice writing down the ATIS/AWOS/ASOS using its listed phone number or handheld radio. We suggest using METAR-style contractions for quicker writing, or filling out a pre-formatted pad.

Risk Mitigation & Safety Procedures

- Pre-Flight Risk Mitigation: Self-assessment for pilot and passenger (IMSAFE) and other factors (PAVE). *Rule of thumb*: If 2+ marginal risks are identified using the PAVE model, assume a no-go decision.
- Scenario SRM/ADM: Using the scenario above, discuss any risks that may be present. Before making a go/no-go decision, discuss what else can be done to mitigate the risks (waiting until a later time to reassess, etc.).
- Scenario Route Planning: For the scenario's "scenic flight," identify practice area boundaries on a sectional chart. The SP will pick their route from home airport to practice area using roads, landmarks, etc. These directions will be used in-flight—this allows the SP to see firsthand if they picked adequate points (identifiable from air).

Rudder Usage

- Coordinated vs. Uncoordinated Flight (Review the aircraft's 3 Axes)
- Progressive increase in pressure rather than stomping on the rudder (especially at high speeds where control surfaces are more effective)
- Left-turning tendencies

Traffic Pattern (+ APP/DEP Procedures)

- Legs of pattern
- Entry: 45° angle to Downwind Leg
- Departure: 45° angle or Straight-out
- Radio calls at controlled/uncontrolled airports

Taxi Procedures (+CW Correction)

- Review RWY Incursion Avoidance (clearing taxiways and other movement/nonmovement areas verbally); introduce airport diagrams and writing down taxi clearances to avoid expectation bias (if at controlled airport)
- Crosswind Correction: Discuss windsock location by using airport diagram—we want them to look outside to avoid heads-down activity when moving!

Pilot's Control of Lift

- AoA; Airspeed; AoA and Airspeed; Flaps
- How do we use any and all of those during takeoff?

Secondary Flight Controls

- Flaps: Purpose; when to use; how they affect stall speed, drag, lift, etc; asymmetric flap deployment
- Trim: Relieves control pressure; Remember priorities— Pitch, Power, *then* Trim!

Aircraft's Instrument Panel

- Basics of 6-pack instruments; introduce scan
- Remember: we are still trying to enforce flying by visual reference. This is merely to familiarize the SP with how to interpret their bank/pitch, airspeed, altitude and coordination.

Flight Tasks

Checklist Usage & Cockpit Management

- Reinforce importance of secure cockpit (everything strapped in, kneeboard usage, etc.)
- Record WX (ATIS/AWOS/ASOS) & taxi information; Prompt SP which RWY is in-use based on what they just heard (and discuss calm-wind RWYs)

Engine Operation

- ENG start, warm-up, run-up w/minimal assistance
- Review ENG gauges (OT, OP, etc.)

Positive Exchange of Flight Controls

Radio Communications

- SP starts w/ground communications (work your way up to in-air comms)

Taxi & RWY Incursion Avoidance Procedures

- Use printed Airport Diagram to “map out” taxi
- Review verbal callouts while clearing other areas (“Clear left, clear right, cleared to cross”)
- Crosswind Correction—practice even in calm winds; Use HDG bug on DG/HSI to indicate wind direction, but encourage SP to look outside at windsock (heads-down activity only when stopped)!

Pre-Takeoff Brief

- Tailor brief to the RWY in-use and local terrain (i.e. where to land if ENG failure/abnormality throughout takeoff procedure)
- Review Vr/Vy, abort-takeoff points, etc.

Takeoff & Departure Procedures

- SP takes off with IP assistance
- During climb, IP adds in nose-up trim to release SP’s control pressure (demonstrating use of trim)
- Level-off: *Pitch-Power-Trim*

Collision Avoidance

- Review traffic scanning
- Introduce instrument scan, but maintain eyes outside 80% of the time (only verifying what you see outside with your instruments 20% of the time)

Area Familiarization (Landmark Navigation)

- Using scenario from Page 6, follow SP’s predetermined route to practice area (discuss why their chosen waypoints were good or bad)

Straight-and-Level Flight

- SP enters attitude by referencing Horizon Line... then employs instrument scan to verify

Airspeed & Configuration Changes

- Instruct SP to “speed up without changing altitude” or “slow down”
- Energy management using pitch and power
- Simulate final approach descent with/without flaps

Trim Usage

Rudder Usage

- Dutch roll—demo coordinated/uncoordinated flight
- Right-of-way 90° turns—roll into turn w/aileron & rudder; rollout on specific visual point w/opposite aileron & rudder. This creates a pin-point rollout around the longitudinal axis without yaw.

Turns to HDG

- Use aileron & rudder to rollout on specified HDGs (shallow turns)
- Increase to medium banks ($\pm 30^\circ$) and rollout on landmarks/visual points (eyes outside!)

Climbs & Descents

- Straight-on and in turns

Approach & Landing Procedures

- SP records WX report (ATIS/AWOS/ASOS)
- SP flies inbound to home airport using their previously-determined waypoints from scenario;
- SP enters traffic pattern correctly (45° angle to Downwind Leg)
- With SP lightly on controls, IP demos approach to landing; point out windsock on final to confirm WX report recorded earlier

Parking & Securing Aircraft

- SP taxis, parks, secures AC w/minimal assistance

LESSON 3

Energy Management

Ground Lesson 1.0 / Flight Lesson 1.5

Scenario:

You are a realtor, and a potential client wants you to sell their property (located outside a nearby town). Luckily, this town has an uncontrolled airport with a courtesy car. While enroute, you'll survey their property from above before landing to meet them. After discussing terms and conditions, you'll return to your home airport.

Ground Tasks

Risk Mitigation & Safety Procedures

- Review PAVE
- Introduce NOTAMs
- Review local WX information (METAR/TAF) and also introduce the “big picture” means of gathering info—surrounding-area airports, local TV, Windy.com, Weather.com, AviationWeather.gov, etc.

Weight & Balance

- Complete a weight and balance calculation for today's local flight
- **Terminology:** Moment, Arm, CG, Standard Empty Weight, Basic Empty Weight, Useful Load, Payload, Max Takeoff Weight (MTOW)
- Discuss CG locations (forward or aft, and their implications) and how to shift weights around

ENG Run-ups

- Why is it necessary, especially inbetween legs of a long cross country flight?
- Discuss safety checks of carburetor heat, magnetos; You might not notice any unusual sounds or abnormal engine operation during low idle taxi, but you will at higher power settings!

Airport Signs/Marking/Lighting

- Don't forget hold-position markings, airport beacons, and pilot-controlled RWY lighting (different intensities)
- Reference AIM Section 3

Traffic Pattern (+ APP/DEP Procedures)

- Review legs of pattern and entry/exit procedures
- Review takeoff procedure (discuss Vr/Vy + Vx)
- Introduce go-around procedure (+ when to initiate and what happens after climbing away from RWY)

Uncontrolled Field Operations

- Radio communication differences (lack of requirement from FAA to make positioning calls, but why they're important)

- How to determine which RWY is in use (local traffic + AWOS/ASOS + A/FD—does airport have designated calm-wind RWY?)
- Back-taxi ops if minimal taxiways available
- Finding information on FBOs, MX services, fuel services in A/FD

Right-of-Way Rules

- See-and-avoid responsibility
- Reference 14 CFR 91.113

Standard Rate [Turns/Climbs/Descents]

- Turn Coordinators and Turn & Slip Indicators
- How to calculate bank angle for Standard Rate Turn $(TAS/10) + 0.5(TAS/10) = \text{standard rate bank angle}$
- Comfortable/Efficient climb and descent rate = 500 fpm... Discuss 5-7 second lag of VSI

Effects of Flaps

- Increase drag + lift
- Decreases stall speed + rate of climb + ground run
- Uses on takeoff, landing and in-flight

Slow Flight

- If able, practice flow of set-up inside the cockpit before ENG start (after walkaround)
- Discuss practical nature of slow flight, but also risks (airspeed management above MCA - *minimum controllable airspeed*)
- “Backside of Power Curve” — Pitch = airspeed, power = altitude

Stall Characteristics

- Direct relation to AoA, *not* airspeed!
- Sensory cues for pilot leading up to stall: stall warning (light, horn, stick shaker), “sluggish” controls, buffeting, vibration, uncommanded rolling, change in airflow sound, “seat of pants” sensation
- Stalling speeds (and the only time they're accurate is in 1G unaccelerated, coordinated, level flight at a certain weight and CG location)

Flight Tasks

Checklist Usage & Cockpit Management

- Goal for SP: initiate checklist usage while in critical phases of flight (takeoff/climb, descent, landing)

Engine Operation

- SP identifies examples of abnormal engine indications (i.e. Power drops more than 200RPM during magneto check). What's their next step?

Radio Communications

- SP handles all ground communications; incorporates in-air calls

Taxi & RWY Incursion Avoidance Procedures

- SP demonstrates correct crosswind correction during taxi
- Identifies airport signs/markings/lighting as discussed during Ground Tasks

Pre-Takeoff Brief

Takeoff & Departure Procedures

- SP takes off with minimal assistance, maintaining centerline on the ground and on departure leg
- If able, choose a different departure (one they are not familiar with) to practice area for scenario work
- Reinforce priorities: Pitch - Power - Trim

Collision Avoidance

- Clearing turns

Wind Correction In-Flight

- Scenario work—Find parcel of land in practice area to “survey.” SP will track a straight line, introducing weather correction (crabbing/weathervaning).
- 360° turns, shallow to medium banks, around a specified ground point—maintaining set distance and altitude

Straight-and-Level Flight

Airspeed & Configuration Changes

- Simulate 5NM out from destination airport. The pattern is busy—instruct SP to slow down 20 knots for aircraft separation

Trim Usage

Rudder Usage

- Importance of coordination during slow flight/stalls

Turns to HDG

Climbs & Descents

Slow Flight

- Simulate 5NM out from destination airport (will be completed at altitude in practice area—less overwhelming for student). The pattern is busy—IP demos slow flight, SP repeats until comfortable

Power Off Stall

- IP demos slow flight and continuous airspeed degradation until inducing power off stall (recover)
- SP identifies warning signs of stall, as discussed during Ground Tasks

Approach & Landing Procedures

- Return to home airport: simulate traffic alerts along route, & how to avoid traffic (review right-of-way)
- Prompt SP “Which RWY is in use?” based on the ATIS/AWOS/ASOS and local traffic
- SP conducts approach

Go-Around

- When SP is established on final, IP assumes control and demos go-around procedure (SP reenters pattern for full-stop)

Parking & Securing Aircraft

Slow Flight

Low airspeed, high AoA, high PWR setting, constant ALT



LESSON 4

Stalls & Wind Correction

Ground Lesson 1.0 / Flight Lesson 1.5

Scenario:

You are planning to depart from a 2,500' long runway with a 50' treeline at the departure end. Ensure you are below gross weight, and the airplane will clear the treeline on takeoff.

Ground Tasks

SRM & Risk Mitigation

- Personal minimums (Review I.M.S.A.F.E.)
- Hazardous attitudes + External Pressures

Performance Calculations

- CW/HW components (+ AC's Max Demonstrated Crosswind Component)
- Takeoff/Landing distances, fuel burn, etc.
- Review Weight & Balance, and how it may affect performance calculations
- Review V_x & V_y (how to apply them in Scenario)

Aircraft Powerplant

- What kind of engine does your AC have? How much hp? Liquid-cooled or air-cooled? Etc.
- Discuss the function of Magnetos (and why there are two sets...what happens if one fails), spark plugs, carburetor heat/icing

Taxi Procedures

- Progressive taxi instructions (will practice during today's flight)
- AC Lighting during taxi (which ones are on/off, and when do we turn the other lights on?)

Crosswind Takeoff/Landing Procedures

- Side slips, aileron/rudder control
- Refresh on "progressive movements" — i.e. During takeoff, you don't hold full aileron into the wind for the whole ground roll. As you gain speed the controls become more effective, and you don't need that much force to get what you want.
- Emphasize importance of maintaining centerline

Wake Turbulence Avoidance

- Cause of Wake Turbulence?
- Ways to avoid it? Altering flight path/rotation or touchdown points, "waiting it out"
- Controlled Airports: "Caution—Wake Turbulence" or they make you wait several minutes depending on wake category

Stalls

- Basic aerodynamics of a stall; CAoA (Critical Angle of Attack)
- Safe altitudes for maneuver entry/recovery
- Spin awareness—what is a spin, how to avoid and recover from one

Flight Tasks

Checklist Usage & Cockpit Management

- Goal for SP: Initiate checklists without IP's prompt

Radio Communications

- SP conducts all ground and in-air comms

Taxi Procedures

- Simulate (if on uncontrolled field) or request progressive taxi instructions for departure

Takeoff & Departure Procedures

- Crosswind takeoff (maintain centerline throughout entire departure)
- Using same departure used in Lessons 1 & 2, test SP's memory of visual checkpoints to practice area

Wind Correction In-Flight

- Challenge SP to maintain consistent ground track (crabbing for wind drift) to, from and within practice area

Coordination Rolls

- SP Warm-up: maintain coordination while climbing/descending to different HDGs

Slow Flight

- Review; Add-in turns-to-HDG and constant airspeed climbs/descents

Power Off Stall

- Establish satisfactory descent at final approach speed to enter power off stall (full flaps)
- SP identifies warning signs of stall

Power On Stall

- Control yaw, roll at high AoA (adequate rudder)

Approach & Landing Procedures

- Crosswind landing (+ side slip)

Go-Around

- With/without flaps

LESSON 5

Ground Reference & Multitasking

Ground Lesson 1.0 / Flight Lesson 1.7

Scenario:

You want to take three family members to a fly-in breakfast nearby.

Ground Tasks

Preflight Planning

- Weather Briefings: how to obtain/decipher; outlook vs. normal vs. abbreviated
- Weight & Balance: Refer to Scenario listed above. SP completes a weight and balance calculation for three family members and themselves as PIC. Shift weight around as needed to be within limits (or eliminate passengers, if necessary). Will you have enough fuel to cover fuel reserve requirements?
- Performance Calculations: Also referring to the Scenario above, how does performance change with the plane fully-loaded versus with SP and IP?

Cockpit Management

- To further reinforce SRM skills, discuss how to handle distractions in the cockpit (heads-down activity, not scanning for traffic, phones, etc.)
- Sterile cockpit below TPA

Radio Procedures

- Review phonetic alphabet usage (especially with numbers — i.e. 13,000' = "one tree thousand")
- What you need to read back to GND/TWR

CFIT Awareness

- Work into the P.A.V.E. model (under enVironment— identify local terrain figures on sectional chart)
- Most common during approach/landing phase

Stalls

- Ask SP to describe a stall and spin succinctly
- Review spin recovery procedure (P.A.R.E.)
- Discuss falling leaf stalls (will demo during flight)

Ground Reference Maneuvers

- Present profile and goals of each Ground Reference Maneuver (Turns around a Point, Rectangular Course, S-turns)
- Risks of lower altitude maneuvering (600-1,000' AGL = FAA's recommendation for Ground Ref.) — traffic + terrain
- Review wind's affect on ground tracks (+ ground speed vs. airspeed)

Forward Slip to Landing

- Always slip (bank) *into* a crosswind, using enough opposite rudder to maintain straight ground track toward the RWY
- The steeper your bank is, the steeper the descent!

New Terminology

- Part 61 vs. 91 (FAR/AIM)
- Advisory Circulars (AC)
- Airworthiness Directives (AD)
- Squawk Codes (i.e. VFR 1200, "radar contact" squawk codes for flight following, emergency codes, "IDENT")

Flight Tasks

Cockpit Management

- Throughout the flight, introduce realistic distractions (as discussed in Ground Brief) — For example: simulate traffic pattern distractions while completing a Rectangular Course maneuver... Ask the SP to tune in to the ATIS, listen to it, and repeat it back. Ask what the winds are like, and which RWY is in use. This forces the SP to multitask (radio communications while flying a course line, much like in the pattern).

Radio Communications

- Introduce practice area radio communications (position reporting)
- SP handles all ground and in-air comms with minimal assistance from IP

Takeoff & Departure Procedures

- SP chooses appropriate departure route to practice area, based on RWY-in-use, local WX conditions and terrain/obstacles

Power Off Stall

- SP completes as warm-up without IP assistance

Power On Stall

- SP completes as warm-up without IP assistance
- Afterwards, demo falling leaf stall for comfortability

Spin Awareness

Turns around a Point

- Scenario Work: Family members want to see their farm on the way to the fly-in. Complete Turns around a Point over designated area

Rectangular Course

- Refer to “Cockpit Management” above for realistic distractions to employ in-flight

S-Turns

Approach & Landing Procedures

- Review normal and crosswind landings with minimal IP assistance

Go-Around

- With/without flaps

Forward Slip to Landing

- Emphasize “power to idle” before entering slip and situational awareness of wind
- If able, keep power at idle throughout touchdown (this helps relate to ENG-out approaches)
- Review windsock locations on field

LESSON 6

Instrument Flight & Emergency Procedures

Ground Lesson 1.0 / Flight Lesson 1.7

Scenario:

You are flying to a busier Class C airport to pick up a friend who just arrived to town via an airline. You will have to contend with LAHSO, Wake Turbulence, and potential holding in the traffic pattern for inbound traffic.

Ground Tasks

Traffic Pattern Operations

- Review crosswind takeoff/landing procedures
- Contaminated RWY: If the ramp is too wet to sit on, the RWY surface is most likely the same. Discuss NOTAMs (“standing water, wet RWY”) & RCAM. *FAA Definition — 25% or more of the RWY surface area is covered by frost, ice, and any depth of snow/slush/water. Even if contamination is less than 25%, but those portions are within your takeoff/landing operating area, it is still a concern!
- Ground Effect — wingtip vortices, induced drag, floating, low wing vs. high wing aircraft
- Review Wake Turbulence Avoidance
- LAHSO Clearances — what they are, who can accept them, where they’re common, etc.

Load Factor

- Ratio of lift (provided by lifting surfaces) divided by the AC’s total weight — *measured in Gs*
- In S&L Flight, load factor = 1G...compare to in turns
- Stall speed increases with greater load factor (i.e. accelerated stalls)

Windshear, Gusts & Turbulence

- Windshear: sudden change of wind velocity and/or direction; can be vertical, horizontal, or combo; commonly found w/frontal boundaries, temperature inversions, thunderstorms & surface obstructions... How to plan for/avoid? Discuss PIREPs

- Gusts — 80% of wind-related (crosswind & gusts) accidents from loss of control on takeoff/landing; discuss steeply packed isobars/pressure gradients; how to alter final approach speeds and departure procedures to accommodate for gusts
- Turbulence: relative movement of disturbed air... Discuss *mechanical turbulence* (friction from air to ground by uneven terrain or manmade obstacles — common in landing environment)

Stability

- Static vs. Dynamic — what is your AC considered?
- Maneuverability vs. Controllability

Emergency Procedures

- Remember: Aviate - Navigate - Communicate!
- NORDO Procedures & ATC Light Gun Signals
- Emergency squawk codes (75 - taken alive, 76 - radios nix, 77 - goin’ to heaven) & GUARD freq.
- Alternator/Generator failure...is this a dire emergency if you have a substantial amount of fuel in VFR conditions? What happens next?
- Fuel starvation / Leaning procedures (+ fuel too rich, fouled spark plugs)
- ENG failure/abnormality — Vg + glide ratios (trim usage to maintain Vg while running checklists)
- Lost Procedures — basic use of GPS (identifying position on moving map)

Flight Tasks

Radio Communications

- SP communicates position over practice area frequency while completing maneuvers

Takeoff & Departure Procedures

- SP chooses departure, practice area, type of takeoff, etc. using risk management skills
- Aborted Takeoff Procedure — simulate unable to reach Vr by specified point on RWY by use of carb heat or not applying full throttle on takeoff... PWR idle and maximum braking to reject

Slow Flight

Power Off Stall

Power On Stall

Turns around a Point

Rectangular Course

S-Turns

Simulated Instrument Maneuvers

- Straight-and-Level, turns to HDG, climbing/descending turns, compass turns
- When SP completes the maneuvers, instruct to return to home airport

Lost Procedures

- While inbound to airport, simulate lost procedures
- 5 C's: Confess, Conserve, Climb, Communicate, Comply
- Identify local landmarks, towns, roads
- Use basic GPS functions to find location on moving map and create direct-to route

ENG-Out Approach

- IP demos first, SP follows along with checklist and mimicking flows
- SP conducts ENG-Out approach/recovery with adequate airspeed management & checklist usage

Approach & Landing Procedures

- Conduct approaches with all variations of flaps (clean, 10°, 20°, 30°, etc.)
- Stabilized approaches using PAPI/VASI, and how to correct (low/high)

Forward Slip to Landing

LESSON 7

Preflight Planning & Towered Airports

Ground Lesson 1.0 / Flight Lesson 1.7

Scenario:

A friend of yours just moved to a nearby city, and you want to meet them for lunch. The closest airport to them is towered and very busy. As you haven't flown to this area before, you're unfamiliar with the local procedures.

Ground Tasks

Sectional Charts

- Basic symbols, airspace identification, obstacles, terrain, airport information

Preflight Planning

- Scenario Work: Find local towered airport to fly to for today's lesson. Using the sectional chart, SP determines visual route based on surrounding obstacles, terrain, nearby airports for diversions/services/emergency maintenance, etc.
- VFR altitudes
- Review A/FDs — fuel station, RWY types, maintenance/services (+ where to find contact info), right- or left-traffic pattern, etc.
- Elevation gain(if applicable) + Density Altitude
- MSA (terrain, rural/urban, obstacles)
- Review CFIT
- EPs in relation to route — i.e. NORDO (how to land at controlled/uncontrolled airports along route), Low Fuel (airports with fuel), etc.

Airspace

- Class A, B, C, D, E and G (+ rules and equipment/communication requirements for each...when to contact for airspace entry)
- WX minimums — If WX drops below minimums, what do you do? Drop into Class G? Special VFR clearance? Discuss what happens if you encounter inadvertent IMC along route (180° standard rate turn, etc.)
- Tailor instruction based on planned route and class of airports along the way for today's flight
- Review squawk codes (i.e. radar contact, "IDENT")

Flight Tasks

Checklist Usage

- SP demonstrates unprompted checklist usage throughout entire flight
- Goal for SP: During EPs, divide attention between checklist and flying the airplane!

Radio Communications

- Proper communications throughout flight between home airport and destination airport (contacting before airspace entry for permission, etc.)
- On return route, IP simulates traffic advisories along route for SP to respond to

Equipment & Systems Malfunctions

- IP initiates simulated EPs along route, SP responds
- Recommended EPs: ALT/GEN failure, throttle linkage failure, flight control failure (aileron, rudder, elevator), Cabin & ENG fires
- When close to destination airport, simulate no response from TWR on initial contact. SP holds outside of airspace while troubleshooting until two-way communication is reestablished

ENG-Out Approach

Towered Airport Operations

- SP executes full-stop at destination airport, then requests progressive taxi for departure
- Pre-takeoff brief tailored to area
- Depart for home airport

Steep Turns

- Execute while enroute to home airport
- Discuss V_a + load factor

Approach & Landing Procedures

- Correcting unstable/high/low approaches
- Rejected landing procedures
- Review Go-Arounds

LESSON 8

Flight Environment & Emergency Procedures

Ground Lesson 1.0 / Flight Lesson 1.5

Scenario:

You are thinking of buying an old Piper Cub. Its only equipped with an ASI, VSI, Turn & Slip Indicator and Altimeter. There is also no engine-driven electrical system (only a battery) or ADS-B Out [14 CFR 91.225(e)]. Can you fly VFR legally, or will you need to add more instruments to the panel? Is there anywhere you can't fly?

Ground Tasks

Sectional Charts

- Play the *Rocketship Game* – Point to a random spot on the sectional chart. “If your spaceship takes off from here, which airspaces will it travel through?” Remember Class E above Class A!
- Special Use Airspace (SUA)

Airspace

- Special Use Airspace (SUA) + Intercept Procedures (i.e. unauthorized entry in Restricted/Prohibited)

ATC Services

- Radar services; ADS-B systems & aircraft requirements; transponder use & requirements; FSS; traffic advisories; Flight Following.

Aircraft Required Equipment

- Referencing MEL/KEOL
- A.T.O.M.A.T.O.F.L.A.M.E.S. acronym (VFR Day-required equipment, 14 CFR 91.205)
- Inoperative equipment

Aircraft Required Inspections

- A.V.I.A.T.E. acronym (14 CFR Part 91)

Flight Instrument Systems & Failures

- Pitot-Static System (Altimeter, ASI, VSI) and scenarios referencing static failure, pitot failure or combination of both

Electrical System & Failures

- LRUs; circuit breakers; generator vs. alternator; main battery + backup battery (how much operation time on each if alternator fails?)

Ground Emergency Procedures

- Engine fire during start
- “Flooding” the ENG
- Fuel spill
- ENG Backfire
- Egress procedures
- Loss of brakes during taxi



Image courtesy of FAA.gov

Flight Tasks

Turns around a Point

Rectangular Course

S-Turns

Steep Turns

- Goal for SP: Minimal altitude loss and maintaining bank $\pm 5^\circ$

Basic Instrument Maneuvers

- Straight & Level, Turns to HDG, Climbs/Descents
- Review inadvertent IMC procedures (mock radio calls, GPS functions, etc.)

Equipment & Systems Malfunctions

- While returning to home airport, simulate ATIS/ AWOS/ASOS out-of-service. Prompt SP for their next move (overfly, observe windsock, local traffic, METAR on EFB, etc.).

Approach & Landing Procedures

- Review Go-Arounds + Aborted Takeoffs
- Porpoise + balloon corrections on landing

LESSON 9

Energy Management in the Traffic Pattern

Ground Lesson 1.0 / Flight Lesson 1.3

Scenario:

Your little sibling is graduating from college in a town about an hour away (by plane). Unfortunately, the route is pretty barren of visual checkpoints for navigational use (no main roads, rivers, etc.). A fellow pilot says, "Just to be safe, you should back up your visual route with a victor airway."

Ground Tasks

Aircraft Performance

- Review Weight & Balance, performance charts, wind component chart, V_x/V_y , Density Altitude, Ground Effect

Solo Requirements, Privileges & Limitations

- FAR Part 61 & Part 91
- Medical requirements/currency (1st, 2nd, 3rd class)
- Written exams (i.e. pre-solo exam)
- Endorsement expiration dates, recurrency checks

Aircraft Logbooks

- Aircraft vs. ENG vs. Prop
- Review aircraft documents (i.e. POH, A.R.R.O.W.)
- Review required inspections (i.e. A.V.1.A.T.E.)

Basic Navigational Systems

- VOR (types, how-to tune & ID, reception, cross radials, victor airways)
- Review GPS functions

Mental Math for Pilots

- Descent Rate:
 $ALT \text{ to lose} / \text{time to fix} = \text{FPM descent rate}$
- 60:1 Rule (i.e. VOR courses)
- Wind Component:
 $30^\circ \text{ off RWY HDG} = 50\% \text{ of wind is crosswind}$
 $45^\circ \text{ off} = 75\% \text{ of wind}$ • $60^\circ + \text{ off} = 100\% \text{ of wind}$

Flight Tasks

RWY Incursion Avoidance

- SP utilizes airport diagram for assistance; copies taxi clearances correctly; review progressive taxi
- Obtain clearance for high-speed taxi practice (if in controlled environment)

Taxi Procedures

- Before introducing Touch & Goes to the SP, work through high-speed taxis. IP will demo first, then repeat with SP until they feel comfortable.
- What is a High-Speed Taxi? — It's just like a normal taxi, except it's performed on a RWY with more power (to simulate feel of controls during higher speeds... i.e. landing). Conduct a high-speed taxi in landing configuration (flaps, trim, fuel pump, etc.).
- Steps: Start by taxiing the full length of your RWY at half of your stall speed (-20-30 kts/mph) — IP will manage the throttle. Continue this back and forth on the RWY, gradually increasing speed until you've reached the stall speed (SP managing throttle). At stall speed, you'll be able to adjust the pitch and power with positive control to keep the airplane on the ground. This simulates a full-stall landing profile.
- Rudder usage — At stall speed, the nose will likely pop up/down during the high-speed taxi. You will use your rudder to maintain directional control while the nose is off/on the ground. But, be cautious of the nosewheel landing crooked [and zipping you off the RWY into the grass].
- Power management & pitch control — fluid movements instead of dramatic changes; remember to raise nose to/above the horizon line, keeping nose off until it loses energy
- Peripherals/looking outside — encourage SP to look out The Lindbergh Reference (peripherals on each side of panel) and down the RWY while in high-speed taxi. This will make their directional control more precise.

Takeoff & Departure Procedures

- Reconfigure AC for normal takeoff
- Review departure procedure to stay in pattern
- Introduce Touch & Goes (-2-3 laps, then full-stop)

Checklist Usage

- SP continues proficient checklist usage throughout climb, cruise, descent and landing (discuss use of checklist during Touch & Goes)

Approach & Landing Procedures

- Reconfiguring aircraft on rollout
- [In controlled environment] requesting "option" vs. "full-stop"

LESSON 10

Advanced Traffic Pattern

Ground Lesson 1.0 / Flight Lesson 1.5

Scenario:

You are practicing touch and goes at your local airport. Over the CTAF, a Citation jet reports 5 mile final, inbound on the local ILS. You are currently midfield downwind.

Ground Tasks

New Terminology

- NTSB 830
- AIM (and how to find things within AIM)
- ACS Standards

Traffic Pattern Operations

- What to expect (but always double check in A/FD): TPA (1,000' AGL); *Left-hand traffic pattern* (but varies with parallel RWYs or airports with terrain/obstacles)
- When to turn Crosswind Leg (AIM recommends 300' below TPA)
- Best practices to safely retracting flaps (after TO and LD)
- Review Pitch - Power - Trim priorities
- Importance of maintaining Vx/Vy throughout entire climb to TPA
- Controlled Airport Ops: Requesting left/right closed traffic and landing clearances; can always go around, even if cleared for full-stop
- Uncontrolled Airport Ops: lack of legal requirement to announce position, but why we should
- Thermals within the pattern, and how to work through them (golf courses, rivers, coastlines, parking lots, etc.); Review mechanical turbulence
- Side-loading (and how to avoid it)

Crosswind Procedures

- Review taxi crosswind correction
- Review crosswind TO/LD procedures
- Review maintaining straight ground track with wind correction (especially important in traffic pattern to not impose on other traffic or cut yourself short)
- Review windsock/wind indicator locations on-field

Flight Tasks

Taxi Procedures

- Review back-taxi procedures
- Review airport markings/signs/lighting

Takeoff & Departure Procedures

Traffic Pattern Operations

- Scenario: Airfield Management is currently clearing the RWY of birds while you're in the pattern. You need to wait until their vehicle is clear of the RWY to proceed. TWR has instructed you to conduct low approaches at/above 500' AGL until told otherwise.
- Low Approaches — Follow instructions from the scenario above. Maintain centerline over RWY and execute departure-end left/right-closed traffic (continue climbing to TPA). Progressively lower the approach altitude up until -10' above RWY.
- Power + airspeed management is key! Remember that airspeed = energy
- Once SP is comfortable with low approaches, assist with power-off full-stop LD. Then, taxi back to approach end for touch and go practice.
- Touch & Go Practice: Conduct power-off approaches with partial to full flaps.

Radio Communications

Approach & Landing Procedures

- Use of PAPI/VASI (recognizing low/high/on-target approaches)
- Scenario: Due to recent flooding, the first third of the RWY is under water. Land using the last two thirds of the RWY. Adjust pattern and aiming/touchdown point as necessary. Fly approach without PAPI/VASI!

Go-Arounds

LESSON 11

Traffic Pattern EPs

Ground Lesson 1.0 / Flight Lesson 1.3

Scenario:

You're checking the NOTAMs before a morning flight, and notice a helicopter will be spraying for mosquitos within 3NM of the airport and 800' AGL (200' below TPA). The NOTAM will last all morning. You want to stay in the pattern for touch and go practice. The AWOS is reporting 7SM visibility and BKN015.

Ground Tasks

Traffic Pattern Operations

- Review right-of-way rules in pattern

Airspace

- Review TFRs, NOTAM-activated parachute jump zones, etc. and how they fit in to risk mitigation techniques (preflight planning, P.A.V.E.)

EPs within the Traffic Pattern

- Review emergency squawk codes
- Review NORDO procedures
- Refueling — emergency fuel shutoff, AC unsecured, fuel spill, etc.
- Approaches with flat tire (main, nose or tail—if conventional gear)
- Emergency descents over airport (+2,000' AGL) and circle for landing
- Throttle linkage failure
- Carburetor icing
- Door/windows opening during flight
- Brake failure (taxi, landing, aborted takeoff)
- Engine out within each pattern leg—where to land?
- Flap failure
- Trim failure
- Asymmetric fuel indications (temps or low fuel lights)
- High oil temps
- Low volts indication
- WX-related: gust of wind during flare; windshear during climbout; quickly deteriorating WX (precip, ceilings, etc.)
- Flight instrument failure (will practice approaches in-flight without ASI or Altimeter)

Flight Tasks

Takeoff & Departure Procedures

- Goals for SP: Conduct touch and go operations with minimal-to-no assistance from IP; maintain ground track and energy management throughout pattern

Traffic Pattern Operations

- Recommend 8-12 laps of touch and goes, introducing EPs during last couple laps
- Clearing traffic before entering each leg
- Proficient checklist usage throughout

Equipment & Systems Malfunctions

- **Conduct during last couple laps
- Approaches without ASI or Altimeter
- Flap failure — approach in clean configuration
- Carburetor icing
- If at controlled airport, request light gun signals

ENG-Out Approach

Approach & Landing Procedures

- SP reconfigures during rollout for TO w/out issue

Go-Arounds

- Simulate gust of wind during roundout/flare, prompting SP to go-around

LESSON 12

Performance Takeoffs & Landings

Ground Lesson 1.0 / Flight Lesson 1.5

Scenario:

Your friend just bought a house within an airpark community and has invited you to a housewarming party. They only have one RWY (1,500' sod strip). Unfortunately, this RWY almost always has a strong crosswind. The arrival end has no obstacles, but there are 40' tall trees next to the departure end.

Ground Tasks

Short Field TO/LD Procedures

- Review V_x & V_y
- Using all available RWY
- Flap usage & when to retract after TO
- “Simulate maximum braking” to save brakes on landing

Soft Field TO/LD Procedures

- Review Ground Effect
- Flap usage & when to retract after TO
- Keeping nosewheel off ground during ground roll

Performance Calculations

- Review TO/LD performance charts (ground roll + total distance to clear 50' obstacle)
- Adjusting calculations for temperature/pressure altitude/weight
- Review Density Altitude & calculate for today

Flight Tasks

Takeoff & Departure Procedures

- Review Aborted Takeoffs (simulate ENG failure on ground roll)

Short Field TO/LD

- IP demos, SP repeats until comfortable
- Show importance of using PAPI/VASI and a proper aiming point
- Use of power to manipulate altitude
- “Maximum braking” — use aerodynamic braking + simulate full toe brakes; retracting flaps to put more braking power on wheels

Soft Field TO/LD

- IP demos, SP repeats until comfortable
- Use of power to land softer (retaining power through descent or adding in during roundout/flare)
- Keeping nosewheel off the ground until loses energy, but still retain full back pressure

Forward Slip to Landing

Approach & Landing Procedures

- Review bouncing/floating recoveries

Go-Arounds

- Review in variety of flap configurations

LESSON 13

Simulated Instrument & Unusual Attitudes

Ground Lesson 1.0 / Flight Lesson 1.2

Scenario:

While holding short, waiting for departure, you see a fog bank rolling over the coastal area towards you. You think you can beat it by taking off now. As you depart, light rain starts to speckle your windshield. Your visibility starts to progressively decrease, until you find yourself in inadvertent IMC.

Ground Tasks

Flight Categories

- VFR, MVFR, IFR, LIFR
- Review cloud clearances + minimums per airspace

Emergency Procedures

- Inadvertent IMC (day and night conditions) —
Common Scenarios: thickening haze, flying into cloud layer during descent, rapidly deteriorating systems, XC flight/in-between airports, rapids to valleys (fog), light precip suddenly turning heavy
- Gyro failure + compass turns
- Loss of Control (LOC), spirals, skud running
- Review CFIT, load factor and instrument scans

Unusual Attitudes

- Unusual attitude recovery (nose high + low)
- *Commonly result from:* distractions, instrument failure, turbulence, confusion, recklessness, currency vs. proficiency issue
- Review motion sickness procedures (sick sack location) before today's flight, just in case!

Aeromedical Factors

- TRUST YOUR INSTRUMENTS! If you can't see past your propeller, you've lost sensory input valuable to your eyes. Your ears (and its fluid-filled canals) then start taking over, whether you like it or not.
- Spatial disorientation + vestibular illusions — body's limitations of vision, respiration, etc. + inner ear functions
- Maintaining situational awareness & cockpit mgmt:
Example — You are in a prolonged standard rate turn within the clouds. Entering IMC was not intentional, so you are obviously anxious—quickly looking between your panel and a checklist on your lap. By moving your head abruptly up and down while in a turn, you could induce Coriolis Effect. This effect makes it seem like the aircraft is rolling, pitching and yawing all at the same time (the same feeling you get when rolling down a hill as a kid).

Flight Tasks

Takeoff & Departure Procedures

- Scenario: Due to pothole repairs, the last third of the RWY is unusable. What kind of performance takeoff will SP execute? (short field)

Short Field TO/LD

Soft Field TO/LD

Basic Instrument Maneuvers

- Turns (progressively increase bank from 10 to 30°)
- Emphasize small corrections (large ones will encourage disorientation)
- Practice using ATC services (vectors), radio communications and GPS/VOR functions during simulated instrument flight

Unusual Attitudes

- SP puts chin to chest w/eyes closed. Instruct SP to start a standard rate turn, either direction (with continuous start/stop prompts). Once SP enters unusual attitude, “go visual” and recover.
- Continue with “standard” unusual attitude recovery (initiated by IP)

Approach & Landing Procedures

- Scenario: You will be landing on a sod strip that’s still a little wet from light rain early this morning. What kind of performance landing will SP execute? (soft field)

LESSON 14

Day-to-Night Transition

Ground Lesson 1.0 / Flight Lesson 1.4

Scenario:

You have decided to take your significant other on a special date! The plan is to take off at civil twilight, fly over the local park where you had your first date, then continue to a nearby down for dinner. On the way back, they will have a beautiful moonlit view. The TAF shows VFR conditions with few clouds around 6,000' for the night.

Ground Tasks

Nighttime Definitions

- Evening/Morning Civil Twilight
- “Night” FAA Definition — 14 CFR 1.1
- Logging night time + pilot currency

Aircraft Required Equipment

- A.T.O.M.A.T.O.F.L.A.M.E.S. (*Day VFR equipment*) + F.L.A.P.S. (*Night VFR equipment*) — 14 CFR 91.205
- Lighting — discuss requirement for landing lights (or lack thereof) and position lighting (+ how to tell which direction an aircraft is going at night by referencing their position lights)
- FAA Required Fuel Reserves

Airport Operations

- Review Airport Lighting
- Identifying & using VASI/PAPI + REIL (and how to know if your airport has one...use A/FD)
- Pilot-controlled lighting (“*L” on sectional chart)
- RWY Incursion Avoidance — taxiing slower (+ animal crossing hazards)
- Controlled Airport Ops (i.e. Class D operating as Class E when closed)
- When to initiate roundout/flare: discuss poor depth perception during night + using visual cues (i.e. tire marks on RWY) to signify when to start roundout

Nighttime Flight Environment

- Review MSAs, CFIT and obstacle clearances (urban and rural)... Use sectional chart & satellite imagery to visualize surrounding obstacles and terrain
- Discuss large cell towers (+1,000' high towers with cables from top to base that are virtually invisible)
- Nighttime Illusions: autokinesis, black hole effect, false horizons, flicker vertigo, head-up, etc. (trust your instruments)
- Review instrument scan
- Weather trends during day-to-night transition — landing cooling rapidly... temp + dew pt (looking for visible moisture when within 2°)
- **When the city lights disappear, you might be entering a cloud!

Aeromedical Factors

- General eye anatomy (purposes + shortcomings of rods vs. cones)
- How long do eyes take fully adjusting to nighttime? ~30 minutes (+ how to preserve night vision)
- FAA Oxygen Recommendation above 5,000'

Cockpit Management

- Avoiding bright white light inside the cabin to preserve night vision (+ dimming GPS/electronics)
- Bringing multi-colored headlamp for preflight and in-cockpit use
- Fully charge devices
- Secure everything you'll need in-flight within grabbing range (moving around too much during flight could cause disorientation, much like IMC)

Flight Tasks

Takeoff & Departure Procedures

- Preflight during civil twilight to show student the transition phase from light to dark
- Prepare for takeoff ~40 min. after civil twilight
- Depart airport for local area

Night Operations

- Identify local airport's rotating beacon, if equipped
- Fly over darker areas to illustrate black hole effect + spatial disorientation risk
- Identify aircraft position using GPS moving map & NRST function
- Tune & ID local VOR & intercept specified radial
- Illustrate false horizon using city lights surrounding home airport

Approach & Landing Procedures

- 5 full-stop landings
- Practice with & without landing light

THE STAGE CHECK:

This is the SP's time-to-shine before their first solo flight. They must show proficient SRM skills and aircraft control during all phases of flight. The IP will essentially act as a warm body in the right seat (only assisting if necessary for safety). Before starting, sit down with the SP to discuss your expectations and the flight's profile.

* During the flight, IP should only prompt SP for specific maneuver (i.e. "Show me slow flight"). The SP then needs to independently climb/descend to an appropriate altitude, clear the area, then perform the maneuver.

Ground Tasks

Certificates & Documents

- Student Pilot Certificate
- FAA Medical
- Pre-Solo Written Exam

SRM & Risk Mitigation

- Discuss what resources are available to SP during the flight
- P.A.V.E. + Self-assessment (I.M.S.A.F.E.)
- NOTAMs

WX Reports

- METAR, TAF, ATIS/AWOS/ASOS
- Obtains Weather Briefing for today's flight
- Wind component

Weight & Balance

- Arm, CG, Moment
- Correctly calculates weight and balance within limits with IP for today's flight

Performance Calculations

- Ground roll, total distance, V_x , V_y
- Correctly calculates takeoff and landing distances for today's flight

Aircraft Preflight

- Required documents (A.R.R.O.W.)
- Required equipment
- Required inspections
- Thorough preflight inspection (prompt on oil/fuel types, quantities, minimum values, etc.)

Flight Tasks

Checklist Usage

- Efficient use in all phases of flight

Operation of Systems

- ENG start, warm-up, run-up (+ allowable parameters—i.e. RPM drop during magneto check)

Taxi & RWY Incursion Avoidance Procedures

- Uses airport diagram, writes down taxi clearances, clears taxiway/RWY crossings when necessary, heads-down activity while stopped
- “If you lost comms right now, what would you do?” Turn towards tower (if on controlled field), stop, flash landing light, wait for light gun signals.
- “Is the attitude indicator required for today’s flight?” No. “What would you do if it turned sideways right now during taxi?” Play it safe, return to parking.

Airport Signs/Markings/Lighting

- “What taxiway is that?”
- “When can we cross the hold-short line?”

Pre-Takeoff Brief

- SP conducts thorough pre-takeoff brief, addressing ENG-out landing spots specific to RWY-in-use

Takeoff & Departure Procedures

- Normal/crosswind TO, depart to practice area (whichever area SP chooses based on weather, traffic, etc.)

Radio Communications

Turns around a Point

- Exhibits situational awareness of wind and adjusts correction accordingly

Rectangular Course

S-Turns

Slow Flight

Power Off Stall

Power On Stall

Steep Turns

- Does not exceed V_a

Emergency Procedures

- Equipment & systems malfunctions
- Emergency approach-to-landing
- NORDO procedures + light gun signals
- Emergency equipment + survival gear
- Manages checklist during EPs without interfering with stable flight

Approach & Landing Procedures

- Wake turbulence avoidance
- First lap — Normal/crosswind landing
- Second lap — Prompt situation for go-around
- Third lap — Normal/crosswind landing (full-stop)

Forward Slip to Landing

- Can be applied to any of the three pattern laps (above)

Go-Around

Parking & Securing Aircraft

- + Refueling, if necessary

LESSON 16

First Solo – Pattern

Ground Lesson 2.0 / Dual 0.7 / Solo 0.5

THEIR FIRST SOLO:

Discuss the plan for today's flight with your SP beforehand. You will conduct at least five laps in the traffic pattern "dual." These laps will include landings and go-arounds *without IP assistance*. Once the SP is warmed up, and the IP confident, the IP will get dropped off on a taxiway. The SP will then depart "solo" for their own three laps (specify whether touch-and-go or stop-and-go).

* We recommend the IP has a handheld radio to monitor frequency, just in case. Remember to take pictures, too!

Ground Tasks

Certificates & Documents

- Doublecheck the following: student pilot certificate, medical, completed pre-solo written exam
- Complete required endorsements

SRM & Risk Mitigation

- Currency vs. proficiency — does SP feel ready for today? Complete preflight risk assessments: I.M.S.A.F.E. + P.A.V.E.
- Cockpit management when IP exits aircraft (checklist placement, etc.)
- Discuss radio communications — starting call with "Centennial TWR, N8MA, Student Pilot..."

Preflight Planning

- Review WX reports, weight & balance, performance calculations, wake turbulence avoidance

Solo Limitations

- WX minimums (endorsements) and how to get those increased as time goes on
- Expiration dates to endorsements / recurrency checks + currency vs. proficiency
- Traveling to other airports or outside 25NM home-airport-radius unless endorsed (i.e. commuting)

Flight Tasks

Checklist Usage

Operation of Systems

Radio Communications

Takeoff & Departure Procedures

- Normal/crosswind takeoffs only

Traffic Pattern Operations

- DUAL: 1) Normal/CW LD 2) Balked/aborted TO 3) Go-Around 4) ENG-Out within pattern 5) Normal/CW full-stop LD
- SP drops IP off at taxiway w/handheld radio
- SOLO: Laps 1-3) Normal/CW LD — discuss whether *touch-and-go* or *stop-and-go*... Go-around, if necessary

Approach & Landing Procedures

- Normal/crosswind landings only

Go-Around

- Must see adequate go-around before solo

LESSON 17

Second Solo (Pattern) + Maneuver Review

Ground Lesson 2.0 / Dual 1.0 / Solo 0.5

THEIR SECOND SOLO:

Discuss the plan for today's flight with your SP beforehand. After reviewing maneuvers, EPs and local area operations, you will conduct at least four laps in the traffic pattern "dual." These laps will include landings and go-arounds *without IP assistance*. Once the SP is warmed up, and the IP confident, the IP will get dropped off on a taxiway. The SP will then depart "solo" for their own three laps (specify whether touch-and-go or stop-and-go).

* We recommend the IP has a handheld radio to monitor frequency, just in case. Remember to take pictures, too!

Ground Tasks

Stall Characteristics

- Review causes of stalls; scenarios that make stalls likely; warning signs of impending stall

Spin Awareness

- Review: What is a spin, and what causes it? How do you recover (P.A.R.E.)?

Equipment & Systems Malfunctions

- Review instrument failure (pitot-static system, gyro)
- Review oil temps/pressure, fuel starvation, carb heat (+ induction system)
- Review electrical system failure (+ how much time on main/backup battery?)
- Review emergency squawk codes

Solo Limitations

- Where the can/can't go in local area (+ review radio communications in practice area and local airport)
- WX minimums

Flight Tasks

Takeoff & Departure Procedures

- Dealer's choice of short or soft field takeoff w/ practice area departure

Cockpit Management

- Throughout ground reference maneuvers, IP introduces distractions/unrelated tasks. SP must show good judgement and PIC authority when handling these tasks. See next point for example.
- "What are the winds like back at our home airport?" SP tunes in to ATIS/AWOS/ASOS to check. The IP can also ask for the SP to relay more information from the ATIS while continuing a ground reference maneuver, or in cruise flight.
- Emphasize "Aviate - Navigate - Communicate"

Turns around a Point

Rectangular Course

S-Turns

Slow Flight

Power Off Stall

Power On Stall

- After stalls, IP can also demonstrate accelerated, cross-controlled and trim stalls. Discuss w/SP which environments these will most likely occur (i.e. base to final).

Steep Turns

Equipment & Systems Malfunctions

- Recommended EPs: Alternator/Generator failure, iced-over pitot tube, lost procedures (refresh on basic GPS/VOR functions)

ENG-Out Approach

Approach & Landing Procedures

- DUAL: 1) Normal/CW LD 2) Normal/CW LD 3) Go-Around 4) Normal/CW full-stop LD
- SP drops IP off at taxiway w/handheld radio
- SOLO: Laps 1-3) Normal/CW LD — discuss whether *touch-and-go* or *stop-and-go*... Go-around, if necessary

Go-Around

LESSON 18

Unaccompanied Pattern Solo Ground Lesson 2.0 / Solo 1.0

Scenario:

Your parents haven't flown with you since getting your PPL. You'd like to surprise them tomorrow with an afternoon flight! However, due to a busy work schedule, you haven't flown in 120 days.

Ground Tasks

Airspace

- Review controlled and uncontrolled airport ops
- Review requirements and rules for all classes of airspace (A–G) + WX minimums
- Review Special Use Airpace (SUA)
- Solo limitations: Class B unauthorized unless endorsed (and has received training)

Weather

- Viewing/filing PIREPs
- Review windshear procedures

Traffic Pattern Operations

- Review LAHSO (solo students “unable”)
- Distractions in the pattern — i.e. dropping a pen to the floor while in-flight, forgetting to close window before takeoff, bug in-cockpit, etc.

Dispatch Procedures

- How to dispatch aircraft before an unaccompanied solo flight
-

Flight Tasks

Takeoff & Departure Procedures

- Recommend 8 - 12 laps of *normal/crosswind* TO/LD

Approach & Landing Procedures

Parking & Securing Aircraft

- + Refueling, if necessary

LESSON 19

Local Area Solo

Ground Lesson 2.0 / Dual 0.7 / Solo 1.0

NOTES:

The dual portion of this flight is merely for the IP to ensure SP can navigate to/from the practice area proficiently before solo. While the student is soloing, IP should observe the flight path on a flight tracker w/handheld radio.

Ground Tasks

Aircraft Preventative MX & Servicing

- 14 CFR Part 43
- What you can/can't do as a pilot (i.e. oil change & airing up a tire vs. patching a torn piece of canvas)

Bird Strikes

- How to scan for/avoid birds on or off the ground
- How to report bird strike: practice call/response
- How to preemptively report bird positioning on-field or in-flight to TWR/CTAF (i.e. direction of flight, how many, type, altitude)

Pre-Solo Briefing

- Establish goal for SP's solo flight today (specific maneuvers or procedures needing work, etc.)
-

DUAL Flight Tasks

Takeoff & Departure Procedures

- Normal/crosswind takeoff, depart for practice area

Local Area Procedures

- Position reporting in practice area
- Identifies practice area boundaries and local rules, if any (i.e. don't fly over the schools)

Approach & Landing Procedures

- Inbound — obtains current WX, executes correct radio calls on CTAF or to TWR
- Full-stop, drop off IP for student solo flight

SOLO Flight Tasks

Takeoff & Departure Procedures

- Normal/crosswind takeoff, depart for practice area

Local Area Procedures

- Maneuvers/procedures (assigned in pre-solo brief)

Approach & Landing Procedures

- Full-stop
- Park/secure/refuel aircraft

LESSON 20

Principles of Navigation

Ground Lesson 1.0 / Flight Lesson 1.3

Scenario:

You just moved to the area, and the local pilots want to organize a group flight to a local diner for lunch. This group knows the area very well, and the town isn't far away... But you'd like to plot out a route, just in case.

Ground Tasks

Sectional Charts

- Review basic symbols, airport information
- Pick out VOR information in local area
- How to use in cockpit efficiently

Pilotage & Dead Reckoning

- Using the sectional chart, identify a local airport than can be easily navigated to by visual reference (i.e. following river, staying right of mountains, etc.)
- Using a plotter, draw a pencil line in between your home airport and the destination airport. Measure the distance and true course.
- Pick checkpoints and altitudes (discuss VFR altitudes; review MSAs).
- Discuss different kind of headings (true course, true HDG, magnetic HDG, course HDG)
- Wind drift + drift correction
- Earth's magnetism (agonic line) + variation (isogonic lines)
- Magnetic compass errors

Flight Tasks

Takeoff & Departure Procedures

- Dealer's choice of normal/crosswind, short or soft field takeoff
- On departure, maintain RWY track by referencing magnetic compass
- After level-out, IP gives SP vectors to practice area

Compass Turns

- IP demos compass errors (acceleration, deceleration, turns from N and S)
- Review two-minute turn (standard rate)
- Timed compass turns

Cross Country Navigation

- Instruct SP to follow straight line (road, power lines, etc.), tracking a specified HDG to reinforce wind drift correction
- Identify aircraft position on sectional chart with the help of local landmarks (if necessary, add in the VOR and GPS for assistance). SP must return to the home airport visually, using landmarks/VFR checkpoints shown on sectional

Approach & Landing Procedures

- *If extra lesson time remains, SP can solo in pattern
- Dealer's choice of normal/crosswind, short or soft field landing

LESSON 21

XC Flight Emergency Procedures

Ground Lesson 1.0 / Flight Lesson 1.3

Scenario:

Your old college buddy just moved to a nearby town ($\leq 25\text{NM}$) for a job. This afternoon, you'll fly over for dinner to catch-up. The G430 in your panel has an out-of-date database, so you won't be relying on that for this flight.

Home Airport METAR: KAPA 242256Z AUTO 07008KT 10SM CLR HZ 13/07 A3032

Destination Airport METAR: KBJC 242255Z AUTO 07007KT 10SM FEW015 FEW033 FEW100 10/04 A3030

Ground Tasks

Sectional Charts

- Pick route for today's flight ($\leq 25\text{NM}$) to another airport
- Review airport information + VFR checkpoints
- Identify SUA or controlled airspace along route (and their rules/requirements/wx minimums)

Pilotage & Dead Reckoning

- Review basic skillset while planning today's route

Emergency Procedures during XC Flights

- Diversion procedures (how-to, and when)
- Alternate planning
- Lost procedures (ATC freq. along route for help?)
- Inadvertent IMC
- Emergency descent + ENG-out approach (where to land; review terrain/obstacles along route and any nearby airstrips to use in emergency)

Flight Tasks

Takeoff & Departure Procedures

- Scenario: The asphalt RWY is closed for repair, which means you'll have to takeoff on the sod. (Execute soft field takeoff)
- Depart on predetermined route (mainly pilotage) towards destination airport

Cross Country Navigation

- Follow sectional along route, pointing out VFR checkpoints or visual landmarks along the way.
- Review magnetic compass errors + drift correction
- Review NRST function on GPS (NRST VOR, Airport, etc.)
- Tune & ID local VOR enroute (figure out which radial you are on)
- Transition through controlled airspaces (or simulate, if not applicable)

Radio Communications

- IP mimics flight following radio communications through departure/enroute (+ traffic advisories)
- SP uses correct radio procedures entering/exiting airport environments

Unfamiliar Airport Operations

- Pattern entry
- Execute full-stop, exit RWY to reorganize for return trip (check WX, refuel if necessary, etc.)

Equipment & Systems Malfunctions (return trip)

- Diversion procedures
- Identifying alternate airports
- Inadvertent IMC (fog or cloud layer)

ENG-Out Approach (return trip)

Lost Procedures (return trip)

Approach & Landing Procedures

- Scenario: The asphalt RWY is still closed. Land on the sod. (Execute soft field landing)

LESSON 22

XC Flight Planning

Ground Lesson 1.0 / Flight Lesson 1.8

Scenario:

You and a coworker are part of the company softball team. This year you made it to the playoffs! The next game will be about two hours away by car, but flying sounds more fun. You would be leaving in the morning (14 hours from now). Your coworker is also a private pilot, and has volunteered to fly the return leg. Neither of you are familiar with the destination airport.

Ground Tasks

WX Briefing

- Review Outlook vs. Normal vs. Abbreviated
- Practice obtaining briefing over the phone and online (1-800-WXBRIEF or 1800wxbrief.com)
- Winds + temps aloft
- Obtaining weather in-flight
- Air pressure changes along route — how do we know when to change altimeter setting, etc.

Preflight Planning

- Terminal Area Charts, World Aeronautical Charts, Sectional Charts (what they are all used for, and which one we'll be using today)
- Pick an airport ~25 - 50NM away for today's flight
- Using A/FD + sectional chart, complete airport information on the front page of the Fly8MA VFR Navigation Log — Discuss what kind of TO/LDs they will use at each airport, depending on what kind of RWYs they have.
- Checking NOTAMs
- Review SUA — “If there was a TFR along your direct route, what would you do?” If you had to alter your route around the TFR, how would you add an additional point into your GPS route? (User Waypoint)
- Review emergency survival equipment on-board

Navigation Logs

- Plot course from home airport to destination airport on sectional using plotter (review distance measuring + TC using fixed/rotatable plotters)
- Review magnetic deviation + isogonic lines
- Pick points along route to use as waypoints (+ utilize satellite imagery to ensure adequate visual landmarks are being used)
- Fill out Fly8MA VFR Navigation Log (IP assists SP)
- Introduce basic how-to-use E6B/CX3 flight computers
- Performance: top-of-climb/descent, cruise fuel burn, etc.
- Alternate aerodrome planning; diversion points along route for emergencies
- Discuss fuel stops / FAA fuel reserves (+ why to have stingier fuel reserves based on personal minimums)

Flight Plans

- Use backside of Fly8MA VFR Navigation Log to assist in filing a VFR flight plan (ICAO)
- Activating/closing flight plans
- Review ATC services in-flight

Flight Tasks

Takeoff & Departure Procedures

- While holding short, ensure sectional chart + nav log are accessible (and timer set)
- Execute Short Field TO — be sure to clear 50' obstacle, then accelerate to V_y and retract flaps

Short Field TO/LD

Cross Country Navigation

- Using nav log in-cockpit
- Account for different speed/direction of wind and adjust HDG
- Plan for arrival at destination airport (input standby frequencies, obtain/monitor ATIS/AWOS/ASOS)

Radio Communications

- Leaving home airport, IP obtains updated WX and flight following
- Leaving destination airport, SP obtains WX & FF

Unfamiliar Airport Operations

- Correct pattern entry
- Short field LD (full-stop)
- [Controlled airport] obtain progressive taxi instructions for departure
- Ensure cockpit is reorganized for return trip (i.e. frequencies, GPS route, VOR tune & ID, nav log, timer reset)!

Equipment & Systems Malfunctions

- Electrical system failure (loss of GPS, VOR, radios, etc.)
- Emergency diversion scenario: ENG overheat with reduced power

ENG-Out Approach

Forward Slip to Landing

- Can be accomplished during ENG-Out approach or full-stop landing at home airport

Approach & Landing Procedures

LESSON 23

VORs + Maneuver Review

Ground Lesson 1.0 / Flight Lesson 1.5

SCENARIO:

You are a bush pilot in Alaska. Today, you will be hauling valuable supplies to an isolated village in desperate need. The flight categories reported along the entire route are MVFR with unreported wind conditions. Another issue: you are very unfamiliar with the area, and your intended route.

Ground Tasks

Maneuvers + ACS Standards

- Review maneuver entry/exit procedures
- Introduce ACS Standards & goals for today's flight

VOR Navigation

- How they work, different types (and their ranges)
- Out-of-service radials/VOR stations (how to identify w/sectional, NOTAM or frequency sound)
- Tracking VOR course outbound/inbound
- Ideally, walk out to a local VOR with SP to show in-person!

Flight Tasks

Takeoff & Departure Procedures

- SP chooses RWY, type of takeoff, departure and practice area based on preflight assessment (P.A.V.E.)

Turns around a Point

- Perform all maneuvers to standards discussed during Ground Tasks

Rectangular Course

S-Turns

Slow Flight

Power Off Stall

Power On Stall

Steep Turns

Navigational Systems

- Enroute, simulate the pilot getting lost (see Scenario) after circling around the area (i.e. maneuvers completed before). *Complete the following actions to find your bearing:*
- Identify closest VOR using GPS NRST function or sectional chart
- After SP tune & IDs the VOR, identify the radial you're currently on
- Track inbound/outbound on chosen radial
- Fly directly over VOR (illustrate *cone of confusion*)
- If able, track inbound to home airport using VOR

Approach & Landing Procedures



LESSON 24

Local Area Solo

Ground Lesson 2.0 / Solo 1.0

NOTES:

While the student is soloing, IP should observe the flight path on a flight tracker w/handheld radio.

Ground Tasks

Pre-Solo Briefing

- Establish goal for SP's solo flight today (specific maneuvers or procedures needing work, etc.)
 - "What are today's risks, and how will you manage. mitigate them?" SP uses P.A.V.E./I.M.S.A.F.E. models to discuss their plan of attack — tailor risk assessment to intended maneuvers, as well.
-

SOLO Flight Tasks

Takeoff & Departure Procedures

- Normal/crosswind takeoff, depart for practice area

Local Area Procedures

- Maneuvers/procedures (assigned in pre-solo brief)

Approach & Landing Procedures

- Full-stop
- Park/secure/refuel aircraft

LESSON 25

Advanced Navigational Systems

Ground Lesson 1.0 / Flight Lesson 1.5

Scenario:

You are flying two friends to a concert and will stay the night before returning home. One-way, it'll take two hrs flight time (four hrs by car). As you walk out to load your friends' luggage, you see a frontal boundary moving in... Currently, the airport and surrounding area have unlimited VFR (except for the scattered storms along the frontal boundary). You don't know how long this unexpected system will last.

Ground Tasks

Instrument Maneuvers

- Review unusual attitude recovery
- Review inadvertent IMC — how to get out of it, radio communications for assistance (vectors)

Navigational Systems

- VOR — course selection, interception, tracking with wind correction
- GPS — how it works (satellite positions, reception/accuracy), flying to/from waypoints, intercepting bearings
- ADF — relative direction to pilot, NDBs

Autopilot

- Use with pilot fatigue or task-saturated environments (maintaining altitude/desired track)... or certain types of emergencies (passenger or radio-related, etc.)
- Basics of use (if equipped)

Flight Tasks

Takeoff & Departure Procedures

- Normal/crosswind takeoff
- In climb, SP goes under simulated IMC (hood/foggles) — IP gives vectors out to practice area + altitude guidance

Basic Instrument Maneuvers

- Once in practice area, SP uses panel to identify their position, relative obstacles/terrain, nearby airports + frequencies they could contact
- Turning climbs/descents

Unusual Attitude Recovery

Navigational Systems

- Return to home airport by GPS w/VOR backup (obtain WX enroute, execute appropriate inbound calls to CTAF/TWR)
- When ~8NM from airport, "You are out of the clouds. Go visual." SP removes hood/foggles.

Short Field TO/LD

Soft Field TO/LD

Forward Slip to Landing

Go-Around

Approach & Landing Procedures

- Conduct approaches in power off + on configurations and dirty/clean flap configurations

LESSON 26

OPTIONAL

Local Area or Pattern Solo

Ground Lesson 2.0 / Flight Lesson 1.0

NOTES:

While the student is soloing, IP should observe the flight path on a flight tracker w/handheld radio.

Ground Tasks

Airspace

- Review entry/exit procedures, WX minimums, radio communications and airspace NOTAMs

Pre-Solo Briefing

- Establish goal for SP's solo flight today (specific maneuvers or procedures needing work, etc.)
 - "What are today's risks, and how will you manage. mitigate them?" SP uses P.A.V.E./I.M.S.A.F.E. models to discuss their plan of attack — tailor risk assessment to intended maneuvers, as well.
-

SOLO Flight Tasks

Takeoff & Departure Procedures

- Normal/crosswind takeoff, depart for practice area

Local Area Procedures

- Maneuvers/procedures (assigned in pre-solo brief)

Approach & Landing Procedures

- Full-stop
- Park/secure/refuel aircraft

LESSON 27

First Dual XC Flight

Ground Lesson 1.5 / Flight Lesson 1.8

Scenario:

You are a top-selling agent at a national real estate firm. They put a lot of trust in you, and have requested you attend a large meeting with a new-home construction company on the other side of the state. Your plan is to be the first buyer on-scene (by flying), giving you the best chance of acquiring an exclusive contract.

Ground Tasks

XC Flight Planning

- Review XC Flight Planning from Lesson 22
- SP obtains appropriate WX briefing, NOTAMS, printed airport diagrams and A/FD information (discuss together)
- SP files VFR flight plan (ICAO)
- Review SP's completed nav log and route (depicted on sectional chart)
- Priorities for today's flight: pilotage, dead reckoning, reaffirming position with VOR & GPS, ATC communications (obtaining flight following)

Flight Tasks

Takeoff & Departure Procedures

- Normal/crosswind takeoff
- Reminder for SP: start timer!

Cross Country Navigation

- Goal for SP: proficient (or near-proficient) use of pilotage, nav log and navigational systems enroute
- Review wind drift and HDG correction
- Update ETEs/ETA enroute

Radio Communications

- SP obtains flight following

Unfamiliar Airport Operations

- Touch & Go at destination airport (immediate departure, quick turnaround time to test SP)

Equipment & Systems Malfunctions (return trip)

- Diversion — entering deteriorating WX conditions
- Radio failure when near home airport

ENG-Out Approach (return trip)

Approach & Landing Procedures

- Normal/crosswind landing

LESSON 28

Unfamiliar Airport Traffic Pattern Ops

Ground Lesson 1.0 / Flight Lesson 1.7

Scenario:

In the valley, spring time brings flowers. It also brings a lot of flooding. Your parents had a home in the valley, but they were fortunately evacuated before the flood passed through! You'd like to fly over their property to observe the damage. And, because you've gotten too comfortable with the 10,000' RWY at home, you'd like to practice landings at a nearby 3,000' RWY.

Ground Tasks

Human Factors

- Refer to 14 CFR Part 67 (I.M.S.A.F.E.)
- Inner/middle ear and sinus issues
- Spatial disorientation
- Review eye anatomy + limitations
- RWY/Landing visual illusions
- Hypoxia + supplemental oxygen
- Hyperventilation — How to treat in-air (PAX)?
- Carbon monoxide poisoning (AC heating systems)
- Dehydration
- Alcohol and drugs
- Stress and fatigue

Preflight Planning

- If your home airport is controlled, fly to an uncontrolled field (and vice versa)!
- Review airspace and airfield procedures for intended route/airport
- Review airport diagrams, A/FD, WX, NOTAMS, right/left traffic at destination airport, etc.

Flight Tasks

Takeoff & Departure Procedures

- Refer to Scenario: Due to recent flooding, much of the RWY is under water. IP picks a point where water begins (i.e. Taxiway D). SP should execute a short field takeoff!

Navigational Systems

- Fly to unfamiliar airport using nav skills learned thus far (sectional chart, pilotage, GPS/VOR — introduce cross-radials in-flight)

Equipment & Systems Malfunctions

- Icing (airframe, pitot tube, static port, etc.)
- Instrument failure

Lost Procedures

Unfamiliar Airport Operations

- Conduct traffic pattern work at airfield (short/soft/normal/crosswind + forward slip + go-around)
- Does this field contribute any landing/RWY illusions? Skinnier/wider than normal, slope of field, etc.

Short Field TO/LD

Soft Field TO/LD

Forward Slip to Landing

Go-Around

Approach & Landing Procedures

- Refer to Scenario: When returning home, you see the portion of RWY that was under water before is now a thick layer of mud (receding flood waters).
- Should we land here?
- How do we know if the RWY surface is usable?
- What type of landing should you execute?

LESSON 29

OPTIONAL

Local Area Solo

Ground Lesson 2.0 / Solo 1.0

NOTES:

While the student is soloing, IP should observe the flight path on a flight tracker w/handheld radio.

Ground Tasks

Airspace

- Review entry/exit procedures, WX minimums, radio communications and airspace NOTAMs

Pre-Solo Briefing

- Establish goal for SP's solo flight today (specific maneuvers or procedures needing work, etc.)
 - "What are today's risks, and how will you manage. mitigate them?" SP uses P.A.V.E./I.M.S.A.F.E. models to discuss their plan of attack — tailor risk assessment to intended maneuvers, as well.
-

SOLO Flight Tasks

Takeoff & Departure Procedures

- Normal/crosswind takeoff, depart for practice area

Local Area Procedures

- Maneuvers/procedures (assigned in pre-solo brief)

Approach & Landing Procedures

- Full-stop
- Park/secure/refuel aircraft

LESSON 30

Night XC Flight

Ground Lesson 1.5 / Flight Lesson 1.8

Scenario:

Your cousin just bought a plane from a guy at your home airport. You have offered to ferry it over to him (over 50NM away). However, you are working from 0900-1700 each weekday—you will have to fly on Friday night. It is currently Tuesday.

Ground Tasks

Night Operations

- Review Night Ops Planning (Lesson 14)
- Review Human Factors (supplemental oxygen recommendations above 5,000')
- Review Illusions
- Review Airport & AC Lighting
- Review CFIT awareness

Preflight Planning

- Review SP's nav log (planned for route of +100NM total distance) + flight planning documents
- Ensure flight plan is filed

Flight Tasks

Takeoff & Departure Procedures

- Normal/crosswind takeoff

Night Operations

- Maintain efficient instrument scan

Cross Country Navigation

- Use of nav log (coordinated with pilotage, dead reckoning... backed up with navigation systems onboard aircraft—GPS/VOR)
- Revise ETA with new headwind/tailwind data

Radio Communications

- Activate flight plan with FSS, then request flight following
- Correct inbound calls (preferably to Class C)
- Requesting "stop-and-goes" at destination airport

Controlled Airport Operations

- Traffic Pattern — how far out to fly downwind; identifying RWYs; obstacle awareness
- Complete 4 TO/LDs to full-stop, then depart for home airport

Equipment & Systems Malfunctions

- Alternator/Generator failure
- ENG roughness

Approach & Landing Procedures

- Obtain WX enroute to home airport
- Normal/crosswind full-stop LD (fulfilling 10 total TO/LD at night for PPL requirement)

LESSON 31

Long Dual XC Flight

Ground Lesson 1.5 / Flight Lesson 2.3

Scenario:

You are volunteering for Pilots & Paws today. You'll be flying to a nearby airport to pick up two puppies, and dropping them off at another airfield where "foster parents" will be waiting for the pups. You should be home by dinner time! See below for visual.

Ground Tasks

XC Flight Planning

- Review SP's nav log (planned for route with three stops—similar or same route as SP's expected long solo XC flight) + flight planning documents
- Ensure flight plan is filed

Airspace

- Review SUA (MOAs, Restricted, Prohibited, etc. and how they relate to today's flight)

Controlled Airport Operations

- Discuss unfamiliar radio calls (i.e. "line up & wait")... SP should never feel embarrassed or afraid to say "please repeat/say again"
- Discuss Approach/Departure/Clearance Delivery frequencies and what they're used for
- Review airspace communication requirements (and as they relate to today's flight)
- Review RWY incursion avoidance, wake turbulence avoidance, nonmovement areas



Flight Tasks**Takeoff & Departure Procedures**

- Normal/crosswind takeoff

Cross Country Navigation

- Proficient use of nav logs, sectional chart, E6B/CX3 and navigational systems (GPS + VOR) enroute

Radio Communications

- Activates flight plan with FSS
- Obtains flight following

Unfamiliar Airport Operations

- Landing at each airport (can be touch-and-go, stop-and-go, short/soft field, forward slip, etc.)

Equipment & Systems Malfunctions**Lost Procedures****ENG-Out Approach****Approach & Landing Procedures**

- Normal/crosswind landing

LESSON 32

Stage 2 Check

Ground Lesson 1.5 / Flight Lesson 2.0

THE STAGE CHECK:

This is the SP's time-to-shine before their first solo cross country flight. They must show proficient SRM skills and aircraft control during all phases of flight. The IP will not offer any assistance, and at no point should safety be questioned. Before starting, sit down with the SP to discuss your expectations and the flight's profile.

Ground Tasks

Certificates & Documents

- Pilot qualifications

SRM & Risk Mitigation

- Preflight risk assessment (P.A.V.E.) + self-assessment (I.M.S.A.F.E.)
- "What are your risks today, and how will you manage/mitigate them?"

Airspace

- Using SP's sectional chart and flight plan, discuss airspace along route and their requirements/rules

WX Reports

- Review weather imagery (aviationweather.gov)
- Discuss SP's WX Briefing

Weight & Balance

Performance Calculations

XC Flight Planning

- Review SP's nav log and waypoint choices
- Fuel stops, airport services (MX)

Aircraft Preflight

- Airworthiness requirements (inspections, equipment, documents)

Flight Tasks**Checklist Usage****Cockpit Management****Pre-Takeoff Brief****Takeoff & Departure Procedures**

- Normal/crosswind takeoff

Radio Communications**Cross Country Navigation**

- SP flies first few points of nav log (pilotage + dead reckoning)
- Adjusts ETEs and HDG as necessary

Navigational Systems

- Proficient VOR + GPS usage

Diversion

- Once satisfied with navigation skillset, tell SP that they are entering quickly-deteriorating weather conditions (MVFR to IFR) and must divert.

Basic Instrument Maneuvers

- Put SP under hood/foggles for straight & level, climbing/descending turns, etc.

Unusual Attitude Recovery**Equipment & Systems Malfunctions****Lost Procedures****ENG-Out Approach****Short Field TO/LD****Soft Field TO/LD****Forward Slip to Landing**

- Can be completed during ENG-Out approach or in traffic pattern

Go-Around**Approach & Landing Procedures****Parking & Securing Aircraft**

- + Refueling, if necessary

LESSON 33

First Solo XC Flight

Ground Lesson 2.0 / Solo 2.0

NOTES:

While the student is soloing, IP should observe the flight path on a flight tracker w/handheld radio (when within local reception).

Ground Tasks

Pre-Solo Briefing

- Approve SP's flight plan (+50NM straight-line distance from point of origin), nav log, WX analysis
 - Doublecheck NOTAMs + intended frequencies
-

SOLO Flight Tasks

Takeoff & Departure Procedures

- Normal/crosswind takeoff
- Remember to start your timer!

Cross Country Navigation

- Use nav log, sectional chart, and navigational systems (GPS + VOR) enroute

Radio Communications

- Activate flight plans via FSS
- Request flight following along route

Unfamiliar Airport Operations

- Full-stop at destination airport
- When safely on the ground and stopped, send a picture to your CFI (selfie with the airport sign)!
Use the bathroom (if needed) & taxi for departure
- Before departure: reorganize cockpit (switch nav log sheet + restart timer), obtain wx (DO NOT TAKEOFF if winds are outside of limits, or wx questionable)

Approach & Landing Procedures

- Full-stop
- Park/secure/refuel aircraft

LESSON 34

Emergency Procedures + Pattern Work

Ground Lesson 1.0 / Flight Lesson 1.5

Scenario:

Last week, an aircraft was checked into maintenance for a faulty pilot-side mic button and smoke coming from behind the instrument panel. As Chief Flight Instructor for your aero club, you must test fly the airplane before releasing it to other members. You'll stay in the pattern, just to be safe.

Ground Tasks

ACS Standards

- Brief tolerances and parameters for today's flight, as they relate to ACS Standards
-

Flight Tasks

Takeoff & Departure Procedures

- Aborted TO

Equipment & Systems Malfunctions

- Electrical system failure (circuit breakers popping out, etc.)
- Instrument failure
- Simulate emergency radio calls to ATC (declaring emergencies, requesting services/assistance)
- If equipped: controllable pitch prop failure, autopilot failure

ENG-Out Approach

- Completed in-pattern (any leg)

Short Field TO/LD

Soft Field TO/LD

Approach & Landing Procedures

Go-Around

LESSON 35

Second Solo XC Flight

Ground Lesson 2.0 / Solo 3.0

NOTES:

While the student is soloing, IP should observe the flight path on a flight tracker w/handheld radio (when within local reception).

Ground Tasks

Pre-Solo Briefing

- Approve SP's flight plan (+150NM total distance, full-stop LDs at three points and one segment of +50NM between TO and LD), nav log, WX analysis
 - Doublecheck NOTAMs + intended frequencies
 - Review possible RWY illusions + airspace enroute
-

SOLO Flight Tasks

Takeoff & Departure Procedures

- Normal/crosswind takeoff
- Remember to start your timer!

Cross Country Navigation

- Use nav log, sectional chart, and navigational systems (GPS + VOR) enroute

Radio Communications

- Activate flight plans via FSS
- Request flight following along route

Unfamiliar Airport Operations

- Full-stop at each airport (two, other than home airport)
- When safely on the ground and stopped, send a picture to your CFI (selfie with the airport sign)! Use the bathroom (if needed) & taxi for departure
- Before departure: reorganize cockpit (switch nav log sheet + restart timer), obtain wx (DO NOT TAKEOFF if winds are outside of limits, or wx questionable)

Approach & Landing Procedures

- Full-stop
- Park/secure/refuel aircraft

LESSON 36

Maneuver Review

Ground Lesson 1.0 / Flight Lesson 1.5

Scenario:

Congratulations! You landed your first commercial job—tour pilot in the Hawaiian islands! Yeah, we're jealous. You've completed your checkouts with the chief pilot, and will be conducting your first single-pilot flight today. As you just moved from Nebraska, you're not too familiar with island weather. But, it'll be a short flight this evening—shouldn't be an issue...

METAR: PHOG 081656Z 06005KT 7SM FEW018 SCT022 BKN040 21/17 A3008

Ground Tasks

ACS Standards

- Brief tolerances for today's flight, as they relate to ACS Standards (tightened maneuver parameters)

Unusual Attitude Recovery

- Review before flight

Flight Tasks

Takeoff & Departure Procedures

- Perform whatever type of takeoff SP is weakest in

Rudder Usage

- Warm-up: review coordinated rolls & rudder usage

Turns around a Point

Rectangular Course

S-Turns

Slow Flight

Power Off Stall

Power On Stall

Spin Awareness

Unusual Attitude Recovery

Approach & Landing Procedures

- Perform whatever type of landing SP is weakest in

LESSON 37

Mock PPL Checkride

Ground Lesson 1.5 / Flight Lesson 1.8

NOTES:

This lesson will be used to test the SP on all skills, and discovering what needs extra work. They must show proficient SRM skills and aircraft control during all phases of flight. The IP will not offer any assistance, and at no point should safety be questioned. Before starting, sit down with the SP to discuss your expectations and the flight's profile. The SP will perform all maneuvers to ACS Standards (and hopefully well-within).

Ground Tasks

PPL Checkride Profile

- Oral Exam
- Practical Exam — planning/flying XC waypoints, navigational systems, diversion, unusual attitudes, maneuvers, EPs, traffic pattern
- What they can/can't use during both portions (allowable resources in oral exam, tools in practical)

Mock Oral Exam

- Refer to ACS for referenced topics
- Incl. preventative MX, applicable FARs (privileges and limitations of PPL), NTSB 830, METAR/TAF special codes, interpreting WX imagery, pilot currency, medicals, AC systems, right-of-way rules, airworthiness retention, inoperative equipment, etc.

XC Flight Planning

- SP adjusts previous 50NM solo flight nav log for today's conditions (wind, temps, GS, fuel, etc.)... The SP will fly the first few points during the mock
- E6B/CX3 review

Flight Tasks**Checklist Usage, SRM + ADM****Taxi & RWY Incursion Avoidance Procedures****Takeoff & Departure Procedures**

- Thorough pre-takeoff brief

Radio Communications**Cross Country Navigation**

- Fly first 3-4 points of pre-planned XC (showing proficient use of pilotage and dead reckoning)

Navigational Systems

- VOR & GPS

Diversion**Basic Instrument Maneuvers****Unusual Attitude Recovery****Turns around a Point****Rectangular Course****S-Turns****Slow Flight****Power Off Stall****Power On Stall****Spin Awareness**

- What is a spin, and how to recover
- Directional control using rudders through stall procedures

Equipment & Systems Malfunctions**Lost Procedures****ENG-Out Approach****Short Field TO/LD****Soft Field TO/LD****Forward Slip to Landing****Go-Around****Approach & Landing Procedures**

LESSON 38

Local Area Solo

Ground Lesson 2.0 / Solo 1.0

NOTES:

While the student is soloing, IP should observe the flight path on a flight tracker w/handheld radio.

Ground Tasks

Pre-Solo Briefing

- Based on previous lesson, establish goal for today's flight (maneuvers/procedures and tolerances)
 - "What are today's risks, and how will you manage. mitigate them?" SP uses P.A.V.E./I.M.S.A.F.E. models to discuss their plan of attack — tailor risk assessment to intended maneuvers, as well.
-

SOLO Flight Tasks

Takeoff & Departure Procedures

- Normal/crosswind takeoff, depart for practice area

Local Area Procedures

- Warm-up: Coordination rolls
- Maneuvers/procedures (assigned in pre-solo brief)

Approach & Landing Procedures

- Full-stop
- Park/secure/refuel aircraft

LESSON 39

Student Progress Evaluation

Ground Lesson 1.0 / Flight Lesson 1.8

NOTES:

The SP will “retest” on any maneuvers marked with one or two bubbles during Mock PPL Checkride (Lesson 37). Those maneuvers must be completed to ACS Standards. They must show proficient SRM skills and aircraft control during all phases of flight. The IP will not offer any assistance, and at no point should safety be questioned. Before starting, sit down with the SP to discuss your expectations and the flight’s profile.

Ground Tasks

PPL Requirements Audit

- Hour requirements — tab out important flights in logbook (cross countries, night)
- Medical, signed
- Student Pilot Certificate, signed
- Endorsements
- Written exam records (and subsequent ground training with IP, if necessary)

ACS Standards

- Review maneuver parameters

Flight Tasks

Takeoff & Departure Procedures

- Pre-Takeoff Brief

VFR Maneuvers

- Review any maneuvers marked with one or two bubbles during Mock PPL Checkride (Lesson 37); perform to ACS Standards

Navigational Systems

- Track inbound/outbound on VOR courses
- GPS functions

Equipment & Systems Malfunctions

- NORDO (in and out of traffic pattern) + light gun signals; Brake failure; Engine Fire during Start; Fuel Spill; Partial panel/instrument failure

Lost Procedures

ENG-Out Approach

Short Field TO/LD

Soft Field TO/LD

Forward Slip to Landing

Go-Around

Approach & Landing Procedures

- Windshear recognition/avoidance
- Wake turbulence avoidance

LESSON 40

Stage 3 Check

Ground Lesson 1.5 / Flight Lesson 2.0

THE STAGE CHECK:

This is the SP's last flight before their official PPL Checkride. The IP is not only testing if the student can pass a checkride, but if they can operate as a *Private Pilot* in the real world, safely! The ACS Standards is only a baseline. Our goal is to go above and beyond the Standards. Safety will be the No. 1 priority during this flight.

The SP must show proficient SRM skills and aircraft control during all phases of flight. The IP will not offer any assistance, and at no point should safety be questioned. Before starting, sit down with the SP to discuss your expectations and the flight's profile.

Ground Tasks

PPL Requirements Audit

- Medical, Student Pilot Certificate, Logbook (and all requirements met), Endorsements, FAA Written Exam (and training, if applicable)

Mock Oral Exam

- Refer to ACS for referenced topics
- Incl. applicable FARs (privileges and limitations of PPL), NTSB 830, METAR/TAF special codes, interpreting WX imagery, pilot currency, medicals, AC systems, right-of-way rules, airworthiness retention, inoperative equipment, etc.
- SP comes with pre-planned XC (nav log, WX briefings for XC and today's local flight, W&B, performance calculations, current sectional chart and aeronautical documents, etc.)

Aircraft Preflight

- Preventative MX, Required Equipment/Inspections/Documents (discuss ADs for training airplane and their fulfillment, if applicable)
- Fuel type/contamination, prop chips, bald spot on tire, etc.

Flight Tasks**Checklist Usage, SRM + ADM****Taxi & RWY Incursion Avoidance Procedures****Takeoff & Departure Procedures**

- Thorough pre-takeoff brief

Radio Communications**Cross Country Navigation**

- Fly first 3-4 points of pre-planned XC (showing proficient use of pilotage and dead reckoning)

Navigational Systems

- VOR & GPS (intercepting/tracking courses)

Diversion

- Due to wall of fog up ahead

Basic Instrument Maneuvers**Unusual Attitude Recovery****Turns around a Point****Rectangular Course****S-Turns****Slow Flight****Power Off Stall****Power On Stall****Spin Awareness****Equipment & Systems Malfunctions****Lost Procedures****ENG-Out Approach****Short Field TO/LD****Soft Field TO/LD****Forward Slip to Landing****Go-Around****Approach & Landing Procedures**

FLOATER GROUND LESSON

Can be accomplished at any time (i.e. flight cancellation due to WX).

AC Systems & Preventative Maintenance Ground Lesson 1.0

SCENARIO 1:

**For best results, bring SP out to the airplane and simulate scenarios.*

During the aircraft preflight, you notice the left main tire is low. You also need to check the brake fluid level.

Discuss hazards (i.e. spinning tire on rim; underinflation for tire flex and—more likely—tire rupture/failure; over-inflated tire—like pumped up basketball—bouncing on LD...less contact surface area on pavement = less traction).

Tire tread: How much tread does a tire need, and who makes that determination (and with which supporting documents)? —PIC makes ultimate decision and is held accountable. Discuss hazards of flat spots.

Discuss how to check brake fluid; find the kind of fluid they need listed in paperwork; how to obtain brake fluid at home airport or away from base.

SCENARIO 2:

**For best results, bring SP out to the airplane and simulate scenarios.*

The landing light bulb needs to be replaced.

Discuss tools needed + how to determine proper part number for bulb (review IPC documentation for the aircraft and show how to find part number).

Ground Tasks

Aircraft Documents + Logbooks

- Scenario 1: Find in POH or MFG documents what the tire pressure should be (usually not located on tire sidewall).
- Scenario 2: Illustrated Parts Catalog (IPC)—where to find it and how to use it
- Explain aircraft logbooks (airframe, powerplant, prop) and why they are in different “books”
- Have SP write a practice MX log entry on scratch paper + review other MX log entries for inspections (Annual, ELT, Transponder, 100 hr, etc.).

Preventative MX (14 CFR Part 43, Appendix A)

- Scenario 1: Using 14 CFR Part 43, Appendix A, show student where they have the authority to air up a tire (and what other tasks they can do).

Aircraft Systems

- Different types of oil viscosities + when you may use 80 vs. 100
- Wiring diagram of ignition system — discuss broken P-lead or bad ignition switch; start aircraft and demonstrate p-lead check on shutdown

FLOATER GROUND LESSON

Can be accomplished at any time (i.e. flight cancellation due to WX).

Flight Planning Scenario

Ground Lesson 1.0

SCENARIO 1:

Finally—it is summer, AKA fly-in breakfast season! A fly-in ~50NM away is scheduled for 1000 this morning (it's currently 0700). You want to bring your mom, dad and sister along with.

Home Airport METAR: KLSE 241256Z AUTO 31008KT 10SM OVC024 FEW026 BKN036 20/15 A3006

Destination Airport METAR: KRST 241255Z AUTO 29011KT 10SM OVC020 FEW029 BKN032 18/14 A3006

Ground Tasks

Preflight Planning

- Select an airport to “fly” to, per the scenario
- Plan route using sectional chart, plotter, E6B/CX3 and Fly8MA Navigation Log

Weather Reports

- WX Briefings (how to obtain/decipher; outlook/normal/abbreviated)
- Scenario: What kind of WX briefing could you obtain right now? What category of flight rules is shown by each METAR above?
- Looking outside the box — weathercams.faa.gov; Traffic cams/live Youtube feeds as “WX cams” ; Call airport manager(s)/FBO to ask if they see “blue sky,” or what (if any) directions look poor around airport
- TAF vs. MOS
- Using TAF/MOS reports along route for better big-picture decision making

Weight & Balance

- What is your available payload for this trip? Can you even bring all three family members? If so, how much fuel can you bring? Will this cover legal and personal minimum fuel reserves?
- How to shift weight around and formulate desirable CG location

Performance Calculations

- Your total takeoff weight is below MTOW, and the CG is within limits—score! But, can you make it off the RWY in time? Your departure RWY is 3,000', and the destination RWY is 2,500' with a 50' treeline on the departure-end.

FLOATER GROUND LESSON

Can be accomplished at any time (i.e. flight cancellation due to WX).

Basic Weather Theory

Ground Lesson 1.0

SCENARIO:

You just moved to the area, and planned to complete your VFR checkout with the local aero club this morning.

SPECI KSDM 121732Z AUTO 21016G24KT 180V240 1SM -RA BR BKN015 OVC025 06/04 A2990 RMK AO2 SLP125 VIS 3/4V1 1/2 \$

TAF AMD MMTJ 121504Z 1215/13011 23009KT 8000 SCT014 BKN027 A2995
TEMP 1216/1219 20015G25 2000 BKN014 BKN023 07/05 A2989 WS020/24045KT

Ground Tasks

Weather Briefings

- How-to obtain online and on the phone (use Fly8MA Weather Briefing form)
- Outlook vs. Normal vs. Abbreviated

Thunderstorms

- Formation (stages)
- The “Anvil”
- Hazards: severe turbulence, hail, strong downdrafts, low level windshear... they even extend into storm’s surrounding area!
- Avoidance (FAA recommends +20NM away)
- Lightning hazards
- AIRMET vs. SIGMET
- Refer to AC 00-24C

Weather Imagery

- Prog charts, outlooks (SIGWX), graphical aviation forecasts (cloud/surface), surface analysis charts, winds aloft/icing/turbulence, satellite imagery, PIREPs, etc.
- Use a combo of aviationweather.gov + ForeFlight/ Garmin EFBs to view imagery

METAR/TAF Decoding

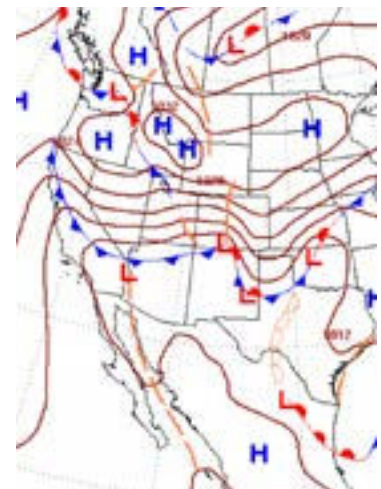
- SPECI (METAR) + AMD (TAF) reports
- Dew Point + OAT — why they matter, and when to look for visible moisture
- See scenario for examples
- Refer to NWS’ METAR Abbreviations document

Preflight Planning

- Review scenarios and plan accordingly (high priority on risk mitigation/management)



Outlook (SIGWX) — Low Level (06Z - 18Z)



Latest Surface Analysis Chart