

Surviving VFR into IMC

Private pilot training Syllabus

Intent

The FAA mandates 3 hours simulated IMC training for all private pilot applicants. The FAA's intent is to give VFR only pilots a fighting chance if they find themselves in IMC. Unfortunately, this training is too often just a check in the box; without a scenario or clear goal. VFR into IMC accidents are 3 times as likely to be fatal compared to engine failures.

This syllabus gives pilots the skills necessary to avoid and escape IMC. The training value is maximized with an ICARUS Smart View Limiting Device to simulate the transition between VMC and IMC. With this tool, instructors can replicate the startle factor just like they can by pulling back the power to simulate an engine failure, to prepare pilots adequately for the emergency.



The goal of this training is to give pilots deliberate, impactful, training to reduce the bite of one of the biggest killers in general aviation.

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Points of Emphasis

-Aircraft Control

Loss of control kills pilots who fly VFR into IMC. Pilots will be swiftly confronted with illusions that can lead to spatial disorientation and must make positive aircraft control their sole focus upon entry into IMC. Pitch and power, small intentional inputs, and good scanning techniques are the key to surviving VFR into IMC.

-Prudent weather decision making and planning

Weather reports are often wrong and always late. We have incredible tools to see weather, but mother nature has a say; fronts can roll in quickly, radar can be misleading, and gaps can close in around us.

Private pilots need to understand that there are two types of clouds, light dreamy puffy pillows and dark nightmares. Regular clouds pose little threat to light aircraft but convective turbulence or icing spells doom.

-Use of automation and technology

Many light aircraft are now equipped with autopilots. These systems can be extremely helpful maintaining control in IMC but it is important to understand their limitations. Unintended autopilot inputs can quickly lead to disorientation.

Few pilots today fly without a tablet or phone. These are incredible tools but also incredibly distracting. It should be emphasized that tablet or smartphone use should be limited in time and scope. Do not try and fly the device.

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Recovery methods and considerations

Escaping IMC and recovering to a safe landing is going to look different depending on the situation and it is important to arm the pilot with tools for the challenge they face. The best plan is the one you are familiar with, prepared for, and comfortable with based on your pilot skills, aircraft's abilities, and the environment.

Upon entering IMC unprepared, pilots need to stabilize the aircraft in level flight. Turn or climb immediately ONLY for known obstacles. Once stable either a turn, climb, or descent is necessary.

A 180-degree turn will often return the pilot to VMC but a full minute in a bank will cause the pilot's inner ear to reach equilibrium setting the conditions for the leans. A climb will get the airplane away from terrain and could result in VMC on top. A descent is the natural tendency but should be cautioned against and only be attempted in limited circumstances.

Primary: Find VMC

Private pilots are likely to find themselves in IMC when an area is transitioning from VMC into IMC, thus patches of VMC likely still exist. The quickest resolution to the emergency is simply finding VMC and landing.

Back up: Poor Mans Instrument approach

If a non-instrument rated pilot is in IMC, ATC can give them vectors and descents to get under a layer and to an airport. This will be an emergency ground-controlled approach, not a published approach familiar to all IFR rated pilots.

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First flight

Begin by first familiarizing the student with the ICARUS Device in the hangar. Have them put it on, adjust it and brief them on its use. Explain how the sudden loss of outside visual cues can startle and lead to spatial disorientation.

Depart with the visor set to VMC and once at the practice area adjust the visibility levels to give them benchmarks during straight and level flight. Relate these levels to legal minimums and discuss prudent personal minimums for a new private pilot. The goal should be for the pilot to walk away with a visibility level that when encountered will cause them to deviate BEFORE going VFR into IMC.

Once they are comfortable straight and level introduce basic IFR maneuvers with zero visibility. Focus on smooth level offs, small inputs and keeping the aircraft appropriately trimmed. Basic instrument maneuvers should be taught in the order they would be flown: A stabilization to straight and level flight, climb to MSA/MVA at a comfortable cruise climb for the aircraft, turns at half and full standard rate, and shallow 100-200 ft/min descents.

While IFR pilots must be proficient in climbing/descending turns, these combinations will likely be outside of a private pilot's ability. With limited training time it is important to try not begin IFR training, even if the pilot intends to pursue the rating.

Make sure to return the student to VMC after every maneuver iteration to maximize transition reps. To add to the realism start simulating turbulence upon entry with gentle random control inputs. Show the student a realistic break out and transition to a VFR scan at the bottom of descents. Remember that often breakouts occur gradually into marginal VMC and replicate this.

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Second Flight

The second flight is scenario based. It should come a later in training when the student is putting everything together and be combined with cross-country requirements. Pilots should also learn about how ATC will respond to their situation and how to formulate an escape plan.

Begin the flight with the visor in VMC and a destination that is unfamiliar to the student. As the aircraft is in route slowly degrade visibility. The transition time can be set up to 20 minutes, allowing for a gradual and imperceptible reduction.

This demonstrates one of the most dangerous VFR into IMC scenarios, where the pilot is getting closer and closer to their destination and “Get there it is” causes them to push into bad weather. Give them simulated weather reports that show the airport above VFR minimums. It is paramount that you teach the student that weather reports are often wrong and always delayed.

If the student chooses to divert, commend them on the decision and then put them into IMC. If they do not, put them into IMC. When they are IMC and have the aircraft in stable flight, get them to simulate reaching out for help on the radios. Make sure they understand Guard is always a good option and that with ADSB other aircraft can often see their position to help.

The instructor needs to get creative in creating a scenario and let the student react as PIC. Make sure to throw some curveballs, like extraneous information, simple equipment malfunctions (take that iPad away!), and reentry into IMC.

Once the student is performing well both in the maneuvers and aeronautical decision making, bring them towards the airport for a simulated breakout into VMC. Discuss and set personal weather minimums in the debrief.

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Conclusion

The goal of these 3 hours of training is to arm the pilot with the skills to fly with a simple instrument scan, have a healthy respect for the weather, and be able to make it home safe. They should fly away with the knowledge on how to interpret weather and develop a weather contingency plan for every flight.