INSTRUMENT FLIGHT TIME FAR 61.51

1) A pilot may log as instrument flight time only that time during which he operates the aircraft solely by reference to the instruments in actual or simulated conditions.(simulated conditions can be in a flight simulator)

2) Each logbook entry should include the place and type of instrument approach and the name of the safety pilot for each simulated instrument flight.

INSTRUMENT RATING REQUIRED FAR 61.3(e)

1) To act as pilot in command under instrument flight rules or:

2) To operate in less than VFR conditions. An *instrument student or non-current instrument related pilot* may not serve as pilot in command but may log as PIC any simulated or actual instrument time.

IFR CURRENCY REQUIREMENTS

PILOT FAR 61

- Flight Review — 24 Calendar Months
- Medical — 24/60 Calendar Months
- IFR Currency — 6 Calendar months or IPC
- Day/Night Landings — 90 Days

Aircraft FAR 91

- Transponder — 24 Calendar Months
- Altimeter/Pitot/Static — 24 Calendar Months
- Annual Inspection — 12 Calendar Months
- 100 Hour Inspection — 100 Hours (rental aircraft)
- VOR Test — 30 days

*Carrying passengers

**The Transponder/Mode C and the Altimeter/Pitot/Static tests are usually performed concurrently and recorded under a single logbook endorsement. The logbook entry is mad in the airframe logbook, VOR rest can be in the airframe logbook but we recommend it be done in a small log book and kept in the air craft.

GENERAL OPERATING AND FLIGHT RULES

PORTABLE ELECTRONIC DEVICES ACCEPTABLE TO USE UNDER IFR FAR 91.21

- Tape recorders.
- Hearing aids.
- Heart pacemakers.
- Electric shavers.
- Any device the pilot has determined will not interfere with navigation or communication systems. (This is a catch all for laptops or other electronic devices.)

PREFLIGHT PLANNING REQUIRED FAR 91.103

- Weather reports and forecasts.
- Fuel requirements
- Alternatives if flight cannot be completed as planned.
- Any known traffic delays as advised by ATC.
- Runway lengths at airports of intended use.
- Takeoff and landing distance data in the approved aircraft flight manual.(remember to include notams)

SIMULATED INSTRUMENT FLIGHT FAR 91.109

- The safety pilot must hold at least a private pilot license with appropriate category and class ratings. **The safety pilot must also hold a current medical certificate**.
- A safety pilot is a "required crewmember", and may log the time as second-in-command. (FAR 61.51)

SPECIAL VFR OPERATIONS FAR 91.157

- Special VFR clearance.
- 1 statute mile ground visibility for takeoff and landing.
- 1 statute mile flight visibility. Remember: 1 Mile visibility is dangerous.
- Clear of clouds.
- Instrument rating and IFR aircraft **required at night** (sunset to sunrise). *Pilot and aircraft must be instrument current.*
  NOTE: You must request this- ATC will not voluntarily give you a special VFR.

IFR FUEL REQUIREMENTS FAR 91.167

Each aircraft shall carry enough fuel to fly to the destination airport (considering weather reports and forecasts) plus:

- Fuel to the filed alternate airport (if required by FAR 91.169(c)) and:
- Fuel to fly for 45 minutes thereafter at normal cruising airspeed.

1-2-3 RULE WHEN ALTERNATE IS NOT REQUIRED FAR 91.169

- When the destination airport has a published instrument approach procedure and weather reports/forecasts indicate:

+ or – 1) Hour of planned ETA;

2) 2,000' Ceilings or Greater and

3) 3 Miles Visibility or Greater.

ALTERNATE AIRPORTS WEATHER REQUIREMENTS FAR 91.169

Airports with a Precision Approach:	600' ceiling 2 miles visibility.
Airports with a Non-Precision Approach:	800' ceiling 2 miles visibility.
Airports without an Instrument Approach:	Ceiling and visibility to allow a descent from the MEA to landing in VFR

VOR ACCURACY CHECK FAR 91.171

No person may operate an aircraft under IFR using the VOR for navigation unless within the preceding 30 days the equipment was checked to be within the following limits:

- Ground check (+ or – 4 degrees)
- VOT test signal (+ or – 4 degrees)
- Dual VOR check (within 4 degrees)
- Airborne check (+ or – 6 degrees)

Each person making the check should enter the date, place, bearing error, and signature in the aircraft log or other record.
*(Remember **DEPS**: **D**ate **E**rror **P**lace **S**ignature)*
(We recommend keeping this in the plane in a small spiral book.)

INSTRUMENT FLIGHT PLAN REQUIRED FAR 91.173

No person may operate an aircraft in controlled airspace under IFR unless that person has:

1) Filed and instrument flight plan.
2) Received an appropriate ATC clearance.
Note: Receiving and appropriate ATC clearance is the key. You can receive a "clearance" by asking for a "Pop Up" clearance. Make sure to ask the controller after they give you the clearance "Understand I am now IFR". When you do this it goes onto the "tape recording" and verifies that you understand that you are under instrument flight rules.

STANDARD INSTRUMENT TAKEOFF MINIMUMS (AIRCRAFT FOR HIRE) FAR 91.175

- 1 statute mile visibility for aircraft with 1 or 2 engines.
- ½ statute mile visibility for aircraft with more than 2 engines.

Takeoff minimums are published in the Jeppesen and NACO approach charts and do not apply to Part 91 flights.

COURSE TO BE FLOWN FAR 91.181

1) On a Federal airway along the centerline of the airway.
2) On any other route, along a direct route between the navigational aids defining that route.

This rule does not preclude maneuvering to pass clear of other aircraft or leading the turn to a new course while crossing a fix.

IFR CRUISING ALTITUDES FAR 91.179

In controlled airspace: Each pilot shall fly the altitude or flight level assigned by ATC. In uncontrolled airspace:

Below 18,000 MSL:

- Easterly Course* Odd altitudes 3,000', 5,000', etc.
- Westerly Course Even altitudes 4,000', 6,000', etc.

At or above FL180 to FL410 including RVSM airspace:

- Easterly Course Odd flight levels FL190, FL210, etc.
- Westerly Course Even Flight Levels FL180, FL200, etc.

(*Magnetic courses)

CHARTED IFR ALTITUDES

MEA	Minimum Enroute Altitude	Navigation reception, obstacle clearance.
MOCA	Minimum Obstacle Clearance Altitude	Navigation reception within 22 nautical miles, obstacle clearance.
MCA	Minimum Crossing Altitude	Obstacle clearance with normal climb.

MRA	Minimum Reception Altitude	Navigation reception of the intersection, obstacle clearance.
MSA	Minimum Sector Altitude	1,000’ obstacle clearance within 25 miles of navaid.
MAA	Maximum Authorized Altitude	Below Special Use Airspace.
MVA	Minimum Vectoring Altitude	At least 500’ obstacle clearance during radar vectors.
OROCA	Off Route Obstacle Clearance Altitude	1,000’ obstacle clearance (2,000’ mountainous) within the quadrangle of latitude and longitude.

MINIMUM IFR ALTITUDES FAR 91.177

1) Except for takeoff or landing, never operate below published minimum altitudes (MEA, MOCA). *A pilot may operate below the MEA and at or above the MOCA within 22 nautical miles of the VOR.*
2) If no minimum altitudes are published:
    a) below 1,000’ above the highest obstacle within 4 nautical miles
    b) below 2,000’ above the highest obstacle within 4 nautical miles (in designated mountainous areas

AIRCRAFT SPEED LIMITATIONS FAR 91.117

Below 10,000’ MSL:	**250 KIAS (288 MPH)**
At or below 2,500’ AGL within 4 NM of a primary Airport of a Class C or D airspace:	**200 KIAS (230 MPH)**
In a Class B airspace Special Flight Rules Area* Or underneath Class B airspace:	**200 KIAS (230 MPH)**

***Or as noted on chart.*

AIRCRAFT SPEED LIMITATIONS AIM 5-3-7

HOLDING AIRSPEED LIMITATIONS

MHA through 6,000’ MSL	**200 KIAS**
6,001’ to 14,000’ MSL	**230 KIAS**
Above 14,000’ MSL	**265 KIAS**
All altitudes when depicted on chart by icon	**175 KIAS**
6,001’ to 14,000’ MSL when depicted on chart by icon	**210 KIAS**

INSTRUMENTS REQUIRED FOR VFR DAY FLIGHT FAR 91.205

- **G**as gauge.
- **O**il pressure gauge.
- **O**il temperature gauge.
- **S**eat belts and shoulder straps.
- **E**mergency locator transmitter.
- **A**ltimeter**.**
- **C**ompass**.**
- **A**irspeed Indicator**.**
- **T**achometer**.**

INSTRUMENTS REQUIRED FOR VFR NIGHT FAR 91.205

- **A**nti-collision light system.
- **P**osition lights
- **E**nergy source.
- **S**pare fuses. One complete set or 3 of each kind.

INSTRUMENTS REQUIRED FOR IFR FLIGHT FAR 91.205

- **C**lock with seconds.*

- **D**irectional gyro.
- **A**ttitude indicator.
- **R**ate of turn indicator.
- **T**wo-way radios and navigational equipment appropriate to the ground facilities being used. **

- **G**enerator or alternator of adequate capacity.
- **A**ltimeter adjustable to pressure.
- **S**lip/skid indicator.

**The clock must display hours, minutes and seconds and be installed in the aircraft.*

***DME is required for flights above flight level 240.*

LANDING UNDER IFR FAR 91.175

1) No person may land an aircraft when the flight visibility is less than the visibility prescribed in the instrument approach procedure being used. Flight visibility is what the pilot sees and not what the tower reports. *This allows a pilot operating under part 91 to fly the approach and land if the visibility allows. The pilot must have the basis for determining flight visibility to be at or above minimums.*

NOTE: <u>It is advisable if the visibility is low to make a statement to the controller that you have part of the runway or a component of the approach such as approach lights.</u>

COMPONENTS OF AN ILS FAR 91.175

1. Localizer.
2. Approach Lights.
3. Glideslope.

4. Marker Beacons.

SUBSTITUTIONS FOR MARKER BEACONS FAR 91.175

The following may be substituted for the outer marker:

- Compass locator, Precision Approach Radar (PAR), or Airport Surveillance Radar (ASR)
- DME, VOR, or NDB fixes authorized in the IAP.
- GPS fix identified in the IAP.

MANEUVERING TABLE

CATEGORY	AIRCRAFT SPEED	CIRCLING RADIUS
A	0-90 KNOTS	1.3 NAUTICAL MILES
B	91-120 KNOTS	1.5 NAUTICAL MILES
C	121-140 KNOTS	1.7 NAUTICAL MILES
D	141-165 KNOTS	2.3 NAUTICAL MILES
E	ABOVE 165 KNOTS	4.5 NAUTICAL MILES

***Aircraft speed is based on the minimum steady flight speed in the landing configuration. Aircraft maneuvering at higher speeds or in a different configuration should use the higher category.*

OPERATION BELOW DH OR MDA FAR 91.175 (C)

No pilot may operate below DH or MDA unless:

1. The aircraft is continuously in a position from which a normal descent to landing with normal maneuvers can be made. Part 121 and 135 require the descent allows touchdown within the touchdown zone of the runway.
2. Flight visibility not less than the minimum visibility required for the approach being used.

NOTE: Call the “lights or runway “to the controller to make sure you don’t get contacted for breaking the visibility requirement.

3. At least one of the following visual references is distinctly visible and identifiable to the pilot:
    a) Approach Light System* (ALS).
    b) Threshold, threshold lights, threshold markings.
    c) Runway End Identifier Lights. (REIL)
    d) Visual Approach Slope Indicator (VASI).
    e) Touchdown zone (TDZ).
    f) Touchdown zone markings or lights (TDZL).
    g) Runway, runway markings or runway lights.

**The pilot may not descent below 100 feet above the touchdown zone unless the red terminating or side row bars are distinctly visible (ALSF-I & ALSF-II).*

A missed approach procedure must be flown when:

1. The landing requirements of 91.175 (c) are not met:

a) Below MDA or:

b) Arrival at the MAP or DH and any time thereafter.

2. Circling to land or above the MDA and an identifiable part of the airport is not distinctly visible (unless vision is blocked from normal aircraft banking).

COMPARABLE VALUES OF RVR AND GROUND VISIBILITY FAR 91.175

• 1600 RVR	¼ statute mile
• 2400 RVR	½ statute mile
• 3200 RVR	5/8 statute mile
• 4000 RVR	¾ statute mile

- 4500 RVR 7/8 statute mile
- 5000 RVR 1 statute mile
- 6000 RVR 1 ¼ statute mile

ATITUDE INSTRUMENT FLYING

PITOT/STATIC INSTRUMENTS

- Altimeter …… Static System
- Airspeed Indicator …….. Pitot/Static System
- Vertical Speed Indicator ……. Static System

GYROSCOPIC INSTRUMENTS

1. **Establish** the attitude and power setting on the control instruments. Known attitude changes and approximate power settings will help reduce pilot workload.
2. **Trim** until control pressures are neutralized. Trim hands-off flight.
3. **Cross-Check** the performance instruments for the desired results.
4. **Adjust** the attitude or power setting on the control instruments as necessary.

CONTROL AND PERFORMANCE INSTRUMENTS

	CONTROL INSTRUMENTS	PERFORMANCE INSTRUMENTS
PITCH	Attitude Indicator	Airspeed Indicator, Altimeter, Vertical Speed Indicator
BANK	Attitude Indicator	Heading Indicator, Turn Coordinator
POWER	Manifold Pressure/Tachometer	Airspeed, Vertical Speed Indicator, Altimeter