FlightInsight
Instrument Ground School

INSTRUMENT PILOT
2024 Edition

Learning Outcomes

Welcome to Instrument Ground School! This course covers the aeronautical knowledge required to operate an airplane as a private pilot under Instrument Flight Rules (IFR). The lectures in this course draw on materials used to train flight students for decades and include topics such as: navigation, flight planning, instrument procedures, weather, communications, regulations, aeromedical factors, and decision-making.

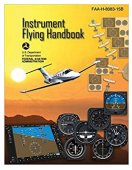
Each of the fifteen topics includes a series of video lectures and animations illustrating concepts. **All the course material is available online once you're enrolled on the FlightInsight course page.** You can supplement the lectures by reading up on the material using the assigned readings listed in the table on the next page. After most of the video lectures, there are a series of practice questions modeled on the actual FAA test. You can take a 60-question timed **practice test** at any time as a dress rehearsal for the real thing!

After successfully completing this course you will be able to:

- Apply your knowledge toward conducting safe, efficient instrument flight;
- Take the Instrument Rating – Airplane Knowledge Examination administered by the Federal Aviation Administration (FAA) for pilot certification. **Completion of the course entitles you to an endorsement to take this exam.**

Resources Used in the Course

The following materials can be used to accompany the online resources for this course. A list of resources recommended for further knowledge is available further below.



Instrument Flying Handbook
This serves as the "textbook" for the course. You can access this FAA publication free online, or purchase your own

Aviation Weather
The FAA also publishes an excellent primer on aviation weather available free on its website

E6-B Flight Computer/Plotter
This tool will be used for flight planning; computing course, heading, groundspeed, wind corrections, times enroute, and fuel consumption

Your Instructor

Dan George is a Certified Flight Instructor-Instrument (CFII) based in Maryland. He has accumulated over 4,000 flight hours, mostly through instructing students.

He has guided dozens of pilots through the challenging process of attaining their Private or advanced ratings.

Dan serves as a Lecturer at the University of Maryland, teaching Aviation in the Aerospace Engineering Department.

He is an instrument rated Commercial Pilot with Single and Multiengine Land ratings and is an FAA Gold Seal Flight Instructor and Instructor Instructor.

Email Dan at training@flight-insight.com

Lecture Listing

IFH = Instrument Flying Handbook
AW = Aviation Weather
E6-B = E6-B Flight Computer/Plotter
FAR = Federal Aviation Regulations
AIM = Aeronautical Information Manual

LECTURE	READINGS	LECTURE SUBJECT	TIME TO COMPLETE
Lecture 1	**IFH-Intro** **IFH-5** **IFH-6** **IFH-7** **E6-B**	**Fundamentals of IFR** Are You IFR Legal? The Flight Instruments for IFR Pressure and Density Altitude Attitude Instrument Flying Magnetic Dip Instrument Failures	**80 minutes**
Lecture 2	**IFH-9**	**VOR and NDB** VOR Explained Tips for Using VORs **(New!)** Navigating with VOR VOR Range Distance Distance Measuring Equipment (DME) Horizontal Situation Indicator (HSI) Non Directional Beacon (NDB)	**120 minutes**
Lecture 3	**IFH-10-13**	**Introducing Instrument Approaches** The Instrument Landing System (ILS) ILS Specifications **(New!)** Flying an ILS **(New!)** Basics of Approach Plates Approach Minimums The Approach Brief The Airport Environment Runway Markings and Lighting	**105 minutes**
Lecture 4	**IFH-10-7**	**Enroute Navigation** The IFR Enroute Low Chart The IFR Enroute High Chart **(New!)** Review of Airspace Airspace on IFR Charts Minimum IFR Altitudes Navigating the Airways The 1 in 60 Rule	**85 minutes**
Lecture 5	**IFH-10-5**	**Departing IFR** Planning an IFR Flight **(New!)** Filing a Flight Plan Do You Need an Alternate? IFR Clearance Departing Nontowered Fields Instrument Departures and SIDs Flying the Obstacle Departure Procedure **(New!)** Diverse Vector Area **(New!)** Cruise Clearance **(New!)**	**110 minutes**

LECTURE	READINGS	LECTURE SUBJECT	TIME TO COMPLETE
Lecture 6	IFH-2 7110.65	**Air Traffic Control** Approach Clearances Picking Up an IFR Clearance Enroute Fly this ILS Approach into Austin Preferred IFR Routes – Tower Enroute Control Arriving at a Nontowered Field Lost Communications Procedures Minimum Vectoring Altitude **(New!)** VFR on Top **(New!)**	**100 minutes**
Lecture 7	IFH-10-13	**The Instrument Approach** Minimum Descent Altitude vs. Decision Altitude Where is the Missed Approach Point? Non Precision Approaches Getting Established on an ILS **(New!)** Flying a Glideslope **(New!)** A Strange ILS **(New!)** Procedure Turns 3 Different Missed Approaches **(New!)**	**110 minutes**
Lecture 8	AW	**Weather Part 1** Heating Effects Winds Clouds and Precipitation	**95 minutes**
Lecture 9	AW	**Weather Part 2** Air Masses and Fronts Weather Hazards	**65 minutes**
Lecture 10	AIM	**Sources of Flight Information** Weather Observations and Forecasts Weather Charts and NOTAMs	**75 minutes**
Lecture 11	AIM	**Global Positioning System (GPS)** RNAV (GPS) Approaches **(New!)** GPS Navigation GPS Sensitivity LP vs. LNAV **(New!)** Advisory Glidepath **(New!)**	**60 minutes**
Lecture 12	IFH-10-10	**Holding Patterns** Hold Entries VOR Holds Triple Drift Correction Unpublished Holds Hold Protection **(New!)**	**55 minutes**

LECTURE	READINGS	LECTURE SUBJECT	TIME TO COMPLETE
Lecture 13	IFH-10-13	**Mastering Approaches** Flying a Backcourse Circle to Land DME Arcs Fly the DME Arc into Martin State Standard Terminal Arrival Routes (STAR) Terminal Arrival Area Visual and Contact Approaches Charted Visual Procedures **(New!)** Localizer Type Directional Aid (LDA) **(New!)** Transitioning to Jeppesen Charts Approach Profiles	**110 minutes**
Lecture 14	**IFH-3**	**Human Factors** The Lungs and Circulatory System Vision and Spatial Orientation Aeronautical Decisionmaking	**70 minutes**
Lecture 15	**FAR 61, 91**	**Review of Regulations (New!)** Certification **(New!)** Preflight Action **(New!)** Operating Rules **(New!)** Oxygen Requirements Applied to IFR **(New!)**	**20 minutes**

Knowledge Test Prep

FlightInsight Ground Schools include comprehensive prep resources to get you ready for the FAA Knowledge Test. Many lecture modules will include a practice quiz with questions from the subject you just learned. Not all the lecture modules have questions associated with them. You might come across some questions that weren't covered in the lecture. The primary purpose of the lecture is to make you a smarter, safer pilot, not to "teach to the test" so to speak. Instead, every question has detailed answer feedback that will give you an edge in your studying.

External Resources

In addition to the lectures and reading materials, there are several online resources available to you. These should be in the toolbox of any instrument pilot.

Aeronautical Information Manual (AIM)
Provides basic flight information and air traffic control procedures. Practically all of the concepts in this course are covered in the AIM, with the exception of regulations which are found in the FAR.

Pilot/Controller Glossary
A compilation of the terms used in the Air Traffic Control system. Like any technical job, aviation uses a good deal of jargon terms. This glossary is designed to promote common understanding of the meaning of such terms and phrases.

JO 7110.65Z
Contains air traffic control procedures and phraseology used by controllers and other ATC personnel. This is the air traffic controller's "bible," and instrument pilots can reference it to gain familiarity with procedures and communications.

Skyvector.com
Aeronautical charts in electronic formats useful for flight planning for both VFR and IFR flights.

Instrument Procedures Handbook
This handbook expands upon the Instrument Flying Handbook, which is used in this course as a "textbook." Advanced information for IFR is introduced here. Concepts and questions that can't be addressed in other official publications can typically be referenced here.

Chart Supplement
The FAA publishes a Chart Supplement to include useful information on airports and instrument procedures not found on aeronautical charts.

Terminal Procedures Publication
The TPP publishes all the instrument procedure charts or "plates" for a covered region and contains over reference information.

Aeronautical Chart Users' Guide
Series of publications which introduce the symbology and information on charts for both IFR and VFR. Serves as a quick reference for any questions of issues on a particular chart.