EXECUTIVE FLIGHT TRAINING

7 DAY INSTRUMENT TRAINING SYLLABUS

By

Douglas Carmody

www.SafePilot.com
843-521-9412

The information contained in this document was current, true, correct and accurate as of the date of publication. However, this document should in no way be used to replace FAA Regulations, Airplane Manuals, or Common Sense and Judgment. It is a document intended for training purposes only. It does not necessarily reflect current regulations, FAA policies or accepted standards. It does reflect my 20 years of successfully training instrument pilots.

Doug Carmody

DAY ONE
Groundschool

YOU NEED TO KNOW:

These are the FARS you need to know for your instrument rating:

FAR 61

61.3 Requirement for Certificates, Rating, and Authorizations.

Instrument rating. No person may act as pilot in command of a civil aircraft under instrument flight rules, or in weather conditions less than the minimums prescribed for VFR flight unless:

In the case of an airplane, he holds an instrument rating or an airline transport pilot certificate with an airplane category rating on it.

61.51 Pilot Logbooks

Instrument flight time. A pilot may log as instrument flight time only that time during which he operates the aircraft solely by reference to instruments, under actual or simulated instrument flight conditions. Each entry must include the place and type of each instrument approach completed, and the name of the safety pilot for each simulated instrument flight. An instrument flight instructor may log as instrument time that time during which he acts as instrument flight instructor in actual instrument weather conditions.

61.57 Recent Flight Experience: Pilot in Command

Instrument experience. No person may act as pilot in command under IFR or in weather conditions less than the minimums prescribed for VFR, unless within the preceding 6 calendar months, that person has performed and logged under actual or simulated instrument conditions, either in flight in the appropriate category of aircraft for the instrument privileges sought or in a flight simulator or flight training device that is representative of the aircraft category for the instrument privileges sought—

(1) At least six instrument approaches.

(2) Holding procedures; and

(3) Intercepting and tracking courses through the use of navigation systems.

Instrument proficiency check. A person who does not meet the instrument experience requirements of this section within the prescribed time, or within 6 calendar months after the prescribed time, may not serve as pilot in command under IFR or in weather conditions less than the minimums prescribed for VFR until that person passes an instrument proficiency check consisting of a representative number of tasks required by the instrument rating practical test.

The instrument proficiency check must be in an aircraft that is appropriate to the aircraft category and must be given by –

(1) An examiner; or

(2) An authorized instrument instructor.

FAR 91

91.21 Portable Electronic Devices

No person may operate, nor may any operator or pilot in command of an aircraft allow the operation of, any portable electronic device on any of the following U.S. registered civil aircraft:

(1) Aircraft operated by a holder of an air carrier operating certificate or an operating certificate; or

(2) Any other aircraft while it is operated under IFR unless the PIC has

determined the device does not interfere with navigation.

91.103 Preflight Action

Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight. This information must include

(a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC.

(b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information;

91.109 Flight Instruction; Simulated Instrument Flight and Certain Flight Tests.

No person may operate a civil aircraft in simulated instrument flight unless:

(1) The other control seat is occupied by a safety pilot who possess at least a private pilot certificate with category and class ratings appropriate in the aircraft being flown.

(2) The safety pilot has adequate vision forward and to each side of the aircraft, or a competent observer in the aircraft adequately supplements the vision of the safety pilot.

91.113 Right-of-Way Rules:

When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft.

Temperature normally decreases with increasing altitude throughout the troposphere. This decrease in temperature with altitude is called the *lapse rate*. The average decrease of temperature—average lapse rate—in the troposphere is **2°C per 1000 feet.**

Sea Level Pressure

Standard sea level pressure is **1013.2 millibars** (mb), **29.92 inches of mercury** (in. Hg), **760 millimeters of mercury** (mm Hg), **or about 14.7 pounds per square inch** (psi) at a temperature of **15.0°C** (59°F).

Pressure Variations with Altitude

In the standard atmosphere, sea level pressure is 29.92 in. Hg. Pressure falls at a fixed rate of 1 inch per 1000 feet upward through this hypothetical atmosphere.

Pressure Gradient Force

Whenever a pressure difference develops over an area, the pressure gradient force begins moving the air **directly** across the isobars. The closer the spacing of isobars, the stronger is the pressure gradient force. The stronger the pressure gradient force, the stronger is the wind. Thus, closely spaced isobars mean strong winds; widely spaced isobars mean lighter wind.

Coriolis Force

The Coriolis force affects the paths of aircraft, missiles, flying birds, ocean currents, and most important to the study of weather, air currents. The force deflects air to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. The pressure gradient force drives the wind and is perpendicular to the isobars. When a pressure gradient force is first established, wind begins to blow from higher to lower pressure directly across the isobars. However, the instant air begins moving, the Coriolis force deflects it to the right. Soon the wind is deflected a full 90° and is parallel to the isobars or contours. At this time, the Coriolis force exactly balances pressure gradient force. With the forces in balance, wind remains parallel to the isobars or contours.

The General Circulation

Pressure differences cause wind. As the air tries to blow outward from a high pressure center, it is deflected to the right by the Coriolis force. Thus, the wind around a high blows **clockwise.** The high pressure with its associated wind system is an *anticyclone.* As winds try to blow inward toward the center of low pressure, they also are deflected to the right. Thus, the wind around a low blows **counterclockwise.** The low pressure center and its wind system is a *cyclone.*

Wind, Pressure Systems, and Weather

Wind blows counterclockwise around a low and clockwise around a high. At the surface, when air converges into a low, it cannot go outward against the pressure gradient, nor can it go downward into the ground; it must go upward. Therefore, a low or trough is an area of rising air. Rising air is conducive to cloudiness and precipitation; thus, we have the general association of **low pressure with bad weather.** Highs and ridges are areas of descending air.

WHAT WE ARE GOING TO DO:
Straight-And-Level Flight

Objective: To develop the basic skill and knowledge of altitude instrument flying as they relate to straight-and-level flight.

Description: A standardized system by which the pitch, bank and power control instruments are integrated to maintain desired altitude, heading, and airspeed.

EXECUTION:

At a constant airspeed, there is only one specific pitch attitude for level flight. At slow cruise speeds, the level-flight attitude is nose-high; at fast cruise speeds, the level-flight attitude is nose-low. The pitch instruments are the attitude indicator, the altimeter, the vertical speed indicator, and the airspeed indicator. The attitude indicator gives you a **direct indication** of pitch attitude. However, unless the airspeed is constant, and until you have established and identified the level-flight attitude for that airspeed, you have no way of knowing whether level flight as indicated on the attitude indicator, is resulting in level airspeed indicator. If the miniature aircraft of the attitude indicator is properly adjusted on the ground before takeoff, it will show approximately level flight at a normal cruise speed when you complete your level-off from a climb. If further adjustment of the miniature aircraft is necessary, the other pitch