

## Federal Aviation Administration, DOT

## Pt. 63, App. B

for a ground training course for flight navigators:

Subject	Classroom hours
Federal Aviation Administration .....	5
To include Parts 63, 91, and 121 of this chapter.	
Meteorology .....	40
To include:	
Basic weather principles.	
Temperature.	
Pressure.	
Winds.	
Moisture in the atmosphere.	
Stability.	
Clouds.	
Hazards.	
Air masses.	
Front weather.	
Fog.	
Thunderstorms.	
Icing.	
World weather and climate.	
Weather maps and weather reports.	
Forecasting.	
International Morse code:	
Ability to receive code groups of letters and numerals at a speed of eight words per minute	
Navigation instruments (exclusive of radio and radar) .....	20
To include:	
Compasses.	
Pressure altimeters.	
Airspeed indicators.	
Driftmeters.	
Bearing indicators.	
Aircraft octants.	
Instrument calibration and alignment.	
Charts and pilotage .....	15
To include:	
Chart projections.	
Chart symbols.	
Principles of pilotage.	
Dead reckoning .....	30
To include:	
Air plot.	
Ground plot.	
Calculation of ETA.	
Vector analysis.	
Use of computer.	
Search.	
Absolute altimeter with:	
Applications .....	15
To include:	
Principles of construction.	
Operating instructions.	
Use of Bellamy's formula.	
Flight planning with single drift correction.	
Radio and long-range navigational aids .....	35
To include:	
Principles of radio transmission and reception.	
Radio aids to navigation.	
Government publications.	
Airborne D/F equipment.	
Errors of radio bearings.	
Quadrantal correction.	
Plotting radio bearings.	
ICAO Q code for direction finding.	
Celestial navigation .....	150

Subject	Classroom hours
To include:	
The solar system.	
The celestial sphere.	
The astronomical triangle.	
Theory of lines of position.	
Use of the Air Almanac.	
Time and its applications.	
Navigation tables.	
Precomputation.	
Celestial line of position approach.	
Star identification.	
Corrections to celestial observations.	
Flight planning and cruise control .....	25
To include:	
The flight plan.	
Fuel consumption charts.	
Methods of cruise control.	
Flight progress chart.	
Point-of-no-return.	
Equitime point.	
Long-range flight problems .....	15
Total (exclusive of final examinations) ..	350

(3) *Flight course outline.* (i) A minimum of 150 hours of supervised flight training shall be given, of which at least 50 hours of flight training must be given at night, and celestial navigation must be used during flights which total at least 125 hours.

(ii) A maximum of 50 hours of the required flight training may be obtained in acceptable types of synthetic flight navigator training devices.

(iii) Flights should be at least four hours in length and should be conducted off civil airways. Some training on long-range flights is desirable, but is not required. There is no limit to the number of students that may be trained on one flight, but at least one astrodrome or one periscopic sextant mounting must be provided for each group of four students.

(iv) Training must be given in dead reckoning, pilotage, radio navigation, celestial navigation, and the use of the absolute altimeter.

(b) *Equipment.* (1) Classroom equipment shall include one table at least 24" x 32" in dimensions for each student.

(2) Aircraft suitable for the flight training must be available to the approved course operator to insure that the flight training may be completed without undue delay.

The approved course operator may contract or obtain written agreements with aircraft operators for the use of suitable aircraft. A copy of the contract or written agreement with an aircraft operator shall be attached to each of the three copies of the course outline submitted for approval. In all cases, the approved course operator is responsible for the nature and quality of instruction given during flight.

(c) *Instructors.* (1) Sufficient classroom instructors must be available to prevent an excessive ratio of students to instructors. Any