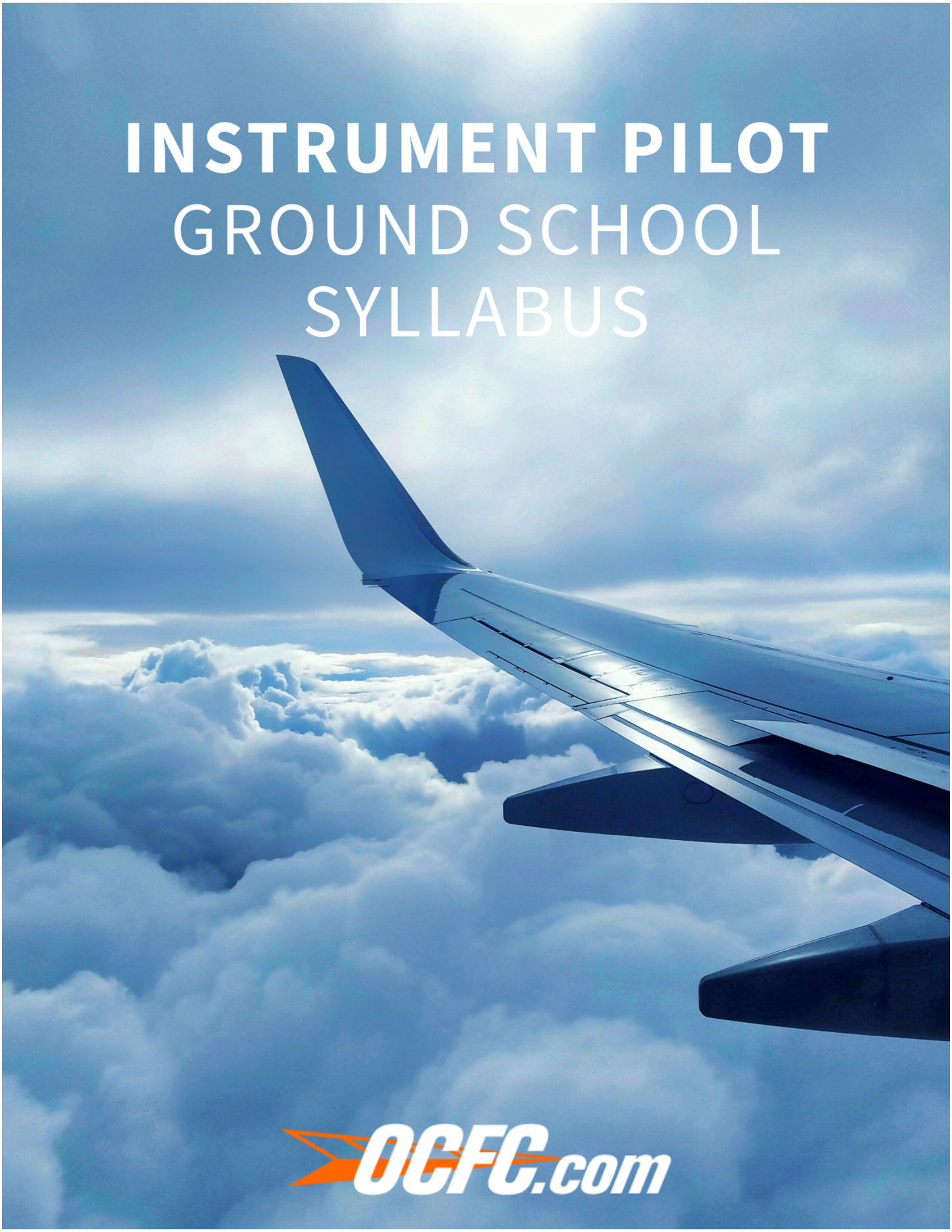
INSTRUMENT PILOT GROUND SCHOOL SYLLABUS



Instrument Pilot Ground School

Course Objective:
Instrument flying opens the door to new experiences, environments and a set of responsibilities that will build upon your skills and proficiency as a pilot. This course is designed to help instrument applicants prepare for the Instrument Rating Airplane knowledge exam required by the Federal Aviation Administration. Additionally, this ground school course may serve as a source of supplemental training to those who have already completed an instrument ground school or may already possess an instrument rating. For those seeking a graduation certificate, one will be issued upon successful completion of the course. Both the Instrument Pilot Knowledge and Practical Tests are required 14 CFR 61.65 to satisfy the eligibility requirements set by the Federal Aviation Administration to receive an instrument rating.

Required Materials:
- Instrument Flying Handbook FAA-H-8083-15B (as amended)
- Instrument Procedures Handbook FAA-H-8083-16B (as amended)
- Current U.S. Terminal Procedures Publication (for your region)
- Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 (as amended)
- Current IFR Enroute Low Altitude Chart
- Current Local Sectional and Terminal Area Chart
- Current Chart Supplement (for your region)
- Flight Computer (mechanical or electronic)
- Sectional Plotter
- Aeronautical Chart User's Guide
- Create account to access weather briefings at 1800wxbrief.com

Suggested Materials:
- Instrument Pilot Airman Certification Standards FAA-S-ACS-8 (as amended)
- Airman Knowledge Testing Supplement for Instrument Rating FAA-CT-8080-3 (as amended)
- Notebook or Electronic Device for taking notes
- Instrument Knowledge Test Prep Book or software
- Pens/Pencils/Highlighters/Eraser/Page tabs

Format:
The Instrument Pilot Ground School consists of 18, 2-hour lessons, organized into three stages of training.

- **Stage one** covers lessons 1-6 of the OCFC Instrument Pilot Ground School Syllabus.
- **Stage two** covers lessons 7-12 of the OCFC Instrument Pilot Ground School Syllabus.
- **Stage three** covers lessons 13-18 of the OCFC Instrument Pilot Ground School Syllabus.

At the end of stages one and two, an exam is administered to cover the respective lesson elements. The stage three exam is a comprehensive final exam given on the last official day of class. The course totals 36 hours of ground training including presented material and three exams in preparation for the FAA knowledge test which

meets the requirement of 14 CFR 141 Appendix C. There are required readings and assignments prior to each class to ensure familiarization of material and a building block style of learning.

Missed Classes

In the event a student misses no more than two regularly scheduled ground lessons, that student may complete the missed ground lesson by scheduling time with an authorized instructor to cover the lesson that was missed during absence.

Course Prerequisites

The student must possess at least a current private pilot certificate and be able to read, speak, write and understand the English language.

Course Completion Standard:

To be considered eligible to receive the course graduation certificate, Orange County Flight Center requires that all lessons be completed, including a minimum grade of 70% on the stage one and two exams and a minimum grade of 80% on the final exam. In the event of an unsatisfactory score, students will have one additional opportunity to take an alternative final exam after receiving instruction and demonstrating satisfactory knowledge of the subject areas in which they were deficient.

Table of Contents

Stage One

Stage One Objectives:
During this stage, the student will be introduced to instrument pilot requirements, airspace, use of IFR low altitude charts, ATC communication, procedures, human factors and aerodynamic factors.

Stage One Completion standards:
Completion of this stage will be verified by passing the stage one exam with a minimum score of 70%. The instructor will review each incorrect response to ensure an adequate understanding of the missed material prior to proceeding to the next stage.

Ground Lesson 1: Intro and The National Airspace System (Part 1/3)

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)

- Pages vii-viii

Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25C (as amended)

- Chapter 15, Pages 1-11

14 CFR Part 61.23, 61.56; 61.57; & 61.65
Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Instrument Flying Handbook: Pages vii-viii
14 CFR Part 61.23, 61.56; 61.57; 61.65
Pilot's Handbook of Aeronautical Knowledge: Chapter 15, Pages 1-11
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including the requirements to obtain an instrument rating, review airspace classifications, VFR weather minimums and flight rules.

Lesson Elements:
Introduction

- ☐ Introduction to IFR Flying
  - Instrument Rating Requirements
  - Maintaining the Instrument Rating
  - VFR/IFR Currency Medical certificate requirements

Chapter 15

- ☐ Controlled Airspace
  - Class A Airspace
  - Class B Airspace
  - Class C Airspace
  - Class D Airspace
  - Class E Airspace
- ☐ Uncontrolled Airspace
  - Class G Airspace
- ☐ Special Use Airspace
  - Prohibited Areas
  - Restricted Areas
  - Warning Areas
  - Military Operation Areas (MOAs)
  - Alert Areas
  - Controlled Firing Areas (CFAs)
- ☐ Other Airspace Areas
  - Local Airport Advisory (LAA)
  - Military Training Routes (MTRs)
  - Temporary Flight Restrictions (TFR)
  - Published VFR Routes
  - Terminal Radar Service Areas (TRSAs)
  - National Security Areas (NSAs)
- ☐ Air Traffic Control and the National Airspace System
- ☐ Coordinating the Use of Airspace
- ☐ Operating in the Various Types of Airspace
- ☐ Basic VFR Weather Minimums
- ☐ Operating Rules and Pilot/Equipment Requirements
- ☐ Parachute Jumps

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 2: The National Airspace System (Part 2/3)

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended):

- Chapter 1, Pages 4-10

Aeronautical Chart User's Guide (as amended)

- Pages 63-96

14 CFR Part 91.177 & 91.179

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Instrument Flying Handbook Chapter 1, Pages 4-10
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including IFR enroute Low Altitude Charts, chart symbols, chart depictions, Terminal Procedure publications and Approach Procedure charts.

Lesson Elements:
Chapter 1

- Federal Airways
- Instrument Approach Procedure Charts
  - Airport Info
  - Charted IFR Altitudes
    - OROCA
    - MRA
    - MEA
    - MOCA
    - MAA
    - MTA
    - MVA
- Navigation Features
  - NAVAIDs
  - Intersections
  - Weather information and Communication features
- Charts Legends and Symbols
- Minimum altitudes for IFR operations
- IFR cruising altitudes

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 3: The National Airspace System (Part 3/3) & The Air Traffic Control System

Study Assignment and Textual Reference(s)
Instrument Flying Handbook FAA-H-8083-15B (as amended):

- Chapter 1, Pages 10-30; Chapter 2, Pages 1-14

Aeronautical Chart User's Guide (as amended)

- Pages 97-133

AIM 4-1 and 4-2
Aeronautical Chart User's Guide: Pages 97-133

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Instrument Flying Handbook: Chapter 1, Pages 10-30; Chapter 2, Pages 1-14
Aeronautical Chart User's Guide: Pages 97-133
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including Terminal Procedures Publications, Terminal Procedure Charts, Terminal Arrival Area, Airport Diagrams, Communication equipment, Facilities, Weather Avoidance Assistance, Approach Control Facilities and Control Sequence.

Lesson Elements:

Chapter 1

- New Technologies
- Terminal Procedures Publications
  - Legends and Symbols
  - Departure Procedures
  - Standard Terminal Arrival Routes
- Terminal Arrival Area (TAA)
- Course Reversal Elements in Plan View and Profile View
- Landing Minimums
- Instrument Approach Procedure Charts
  - Margin Identification
  - The Pilot Briefing
  - The Plan View
- Airport Sketch/Diagram
- Inoperative Components
- RNAV Instrument Approach Charts

Chapter 2

- Communication Equipment
  - Navigation/Communication Equipment
  - Radar and Transponders
- Communication Procedures
- Communication Facilities
- ATC Inflight Weather Avoidance Assistance
  - ATC Radar Weather Displays
  - Weather Avoidance Assistance
- Approach Control Facility
- Approach Control Advances
- Precision Runway Monitor
- Control Sequence

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 4: Human Factors

Study Assignment and Textual Reference(s)
Instrument Flying Handbook FAA-H-8083-15B (as amended):

- Chapter 3, Pages 1-17

AIM Chapter 8

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Instrument Flying Handbook: Chapter 3, Pages 1-17
AIM Chapter 8
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including Sensory Systems, Illusions, Spatial Disorientation, and Optical Illusions.

Lesson Elements:

Chapter 3

- ☐ Sensory Systems for Orientation
  - Eyes
  - Ears
  - Nerves
- ☐ Illusions Leading to Spatial Disorientation
  - Vestibular Illusions
  - Visual Illusions
- ☐ Postural Considerations
- ☐ Demonstration of Spatial Disorientation
  - Climbing while Accelerating
  - Climbing while Turning
  - Diving while Turning
  - Tilting to Right or Left
  - Reversal of Motion
  - Diving or Rolling Beyond the Vertical Plane
- ☐ Coping with Spatial Disorientation
- ☐ Optical Illusions
  - Runway Width Illusion
  - Runway and Terrain Slopes Illusion
  - Water Refraction
  - Haze
  - Fog
  - Ground Lighting Illusion
- ☐ How to prevent landing errors due to Optical Illusions

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 5: Aerodynamic Factors

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)

- Chapter 4, Pages 1-17

Presentation Format: Any combination of visual or oral means may be used to present the required information.
Recommended Presentation Sequence: (2 hours)
Instrument Flying Handbook: Chapter 4, Pages 1-17
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including basic aerodynamics, atmospheric conditions, aerodynamics of maneuvering flight, types and effects of icing.

Lesson Elements:
Chapter 4

- ☐ The Wing
- ☐ Review of Basic Aerodynamics
- ☐ The Four Forces
  - Lift
  - Weight
  - Thrust
  - Drag
- ☐ Newton's First Law, the Law of Inertia
- ☐ Newton's Second Law, the Law of Momentum
- ☐ Newton's Third Law, the Law of Reaction
- ☐ Atmosphere
  - Layers of the Atmosphere
  - International Standard Atmosphere (ISA)
  - Pressure Altitude
  - Density Altitude
- ☐ Lift
- ☐ Pitch/Power Relationship
- ☐ Drag Curves
- ☐ Regions of Command
- ☐ Control Characteristics
- ☐ Speed Stability
- ☐ Normal Command
- ☐ Reversed Command
- ☐ Trim
- ☐ Slow-Speed Flight
- ☐ Climbs
- ☐ Acceleration in Cruise Flight
- ☐ Turns
  - Rate of Turn
  - Radius of Turn
  - Coordination of Rudder and Aileron Controls
- ☐ Load Factor
- ☐ Icing
- ☐ Types of Icing
  - Structural Icing
  - Induction Icing
  - Clear Ice
  - Rime Ice
  - Mixed Ice
- ☐ General Effects of Icing on Airfoils
- ☐ Tailplane Stall Symptoms
- ☐ Propeller Icing
- ☐ Effects of Icing on Critical Aircraft
- ☐ Systems Flight Instruments
- ☐ Stall Warning Systems
- ☐ Windshields
- ☐ Antenna Icing

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 6: Stage 1 Exam

Study Assignment and Textual Reference(s):
Review elements from lessons 1-5, including terms and practice questions.

Presentation Format: Any combination of visual or oral means may be used to present the required information along with a 30-question multiple choice written exam.

Recommended Presentation Sequence:
Review Stage one elements - (0.5 hour)
Stage one Exam- (1:00 Hour)
Correct Stage one Exam- (0.5 hour)

Lesson Objective: During this lesson, there will be a review of the material presented in class. Students will have the opportunity to ask questions. The stage one exam will be administered.

Lesson Elements: Stage One Exam

Review stage one key principles

- Instrument Pilot Requirements,
- Airspace
- Use of IFR Low Altitude Charts,
- ATC Communication and Procedures
- Human Factors

Stage one written exam

Review and correct missed items

Completion Standards: By the end of the class period, the student will have completed the stage one exam with a minimum score of 70%. The instructor will review each incorrect response to ensure an adequate understanding of the missed material prior to proceeding to the next stage.

Stage Two

Stage Two Objectives:
During this stage, the student will be introduced to aerodynamic factors, flight instruments, attitude instrument flying and basic flight maneuvers.

Stage Two Completion standards:
Completion of this stage will be verified by completing the stage two exam with a minimum score of 70%. The instructor will review each incorrect response to ensure an adequate understanding of the missed material prior to proceeding to the next stage.

Ground Lesson 7: Flight Instruments

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)

- Chapter 5 pages 1-38

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 5, Pages 1-38
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including pitot/static systems, gyroscopic instruments, magnetic compass, electronic flight displays and instrument errors/failures.

Lesson Elements:
Chapter 5

- ☐ Pitot/Static Systems
- ☐ Static Pressure
- ☐ Blockages
- ☐ Pitot/Static Instrument
- ☐ Sensitive Altimeter
- ☐ ICAO Cold Temperature Error Table
- ☐ Nonstandard Pressure on an Altimeter
- ☐ Altimeter Enhancements (Encoding)
- ☐ Reduced Vertical Separation Minimum (RVSM)
- ☐ Vertical Speed Indicator (VSI)
- ☐ Dynamic Pressure Type Instruments
- ☐ Airspeed Indicator (ASI)
- ☐ Types of Airspeed
- ☐ Airspeed Color Codes
- ☐ Magnetism
- ☐ The Basic Aviation Magnetic Compass
- ☐ Magnetic Compass Overview
- ☐ Magnetic Compass Errors
- ☐ Gyroscopic Systems
- ☐ Power Sources
- ☐ Pneumatic Systems
- ☐ Vacuum Pump Systems
- ☐ Electrical Systems
- ☐ Gyroscopic Instruments
- ☐ Attitude Indicators
- ☐ Heading Indicators
- ☐ Turn Indicators
- ☐ Turn-and-Slip Indicator
- ☐ Turn Coordinator
- ☐ Flight Support Systems
- ☐ Attitude and Heading Reference System (AHRS)
- ☐ Air Data Computer (ADC)
- ☐ Analog Pictorial Displays
- ☐ Horizontal Situation Indicator (HSI)
- ☐ Attitude Direction Indicator (ADI)
- ☐ Flight Director System (FDS)
- ☐ Integrated Flight Control System
- ☐ Autopilot Systems
- ☐ Flight Management Systems (FMS)
- ☐ Electronic Flight Instrument Systems
- ☐ Primary Flight Display (PFD)
- ☐ Multi-Function Display (MFD)
- ☐ Advanced Technology Systems
- ☐ Automatic Dependent Surveillance Broadcast (ADS-B)
- ☐ Safety Systems
- ☐ Required Navigation Instrument System Inspection

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 8: Airplane Attitude Instrument Flying

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)

- Chapter 6, pages 1-28

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 6, Pages 1-28
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including airplane attitude instrument flying, the four step process, control and performance method, primary and supporting method, instrument scanning techniques and cross-check errors.

Lesson Elements:
Chapter 6

- Learning Methods
- Using the Control and Performance Method
  - Control Instruments
  - Performance Instruments
  - Navigation Instruments
- The Four-Step Process used to Change Attitude
  - Establish
  - Trim
  - Cross-Check
  - Adjust
- Applying the Four-Step Process
  - Pitch Control
  - Bank Control
  - Power Control
- Primary and Supporting Method
  - Pitch Control
  - Straight-and-Level Flight
  - Primary Pitch
  - Primary Bank
  - Primary Yaw
  - Primary Power
- Fundamentals Skills of Attitude Instrument Flying
  - Instrument Cross-Check
  - Scanning Techniques
- Common Errors
  - Fixation
  - Omission
  - Emphasis

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 9: Basic Flight Maneuvers

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)

- Chapter 7, Pages 1-61

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 7, Pages 1-61
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including basic flight maneuvers using analog and electronic flight displays.

Lesson Elements:

Chapter 7

- ☐ Straight-and-level flight
- ☐ Bank Control
- ☐ Power Control
- ☐ Trim Technique
- ☐ Common Errors in Straight-and-level flight
- ☐ Straight Climbs and Descents
- ☐ Turns
- ☐ Approach to a Stall
- ☐ Unusual Attitudes and Recoveries
- ☐ Instrument Takeoff
- ☐ Basic Instrument Flight Patterns
- ☐ Racetrack Pattern
- ☐ Procedure Turn
- ☐ Standard 45° Procedure Turn
- ☐ 80/260 Turn
- ☐ Teardrop Patterns
- ☐ Circling Approach Patterns

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 10: Navigation Systems (Part 1/2)

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)

- Chapter 9, pages 1-24

AIM 1-1-1 through 1-1-8
14 CFR 91.171

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Instrument Flying Handbook Chapter 9, Pages 1-24
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including navigation systems, NDBs, VORs and DME.

Lesson Elements:
Chapter 9

- ☐ Basic Radio Principles
- ☐ How Radio Waves Propagate
  - Ground Wave
  - Sky Wave
  - Space Wave
- ☐ Disturbances to Radio Wave Reception.
- ☐ Traditional Navigation Systems.
- ☐ Nondirectional Radio Beacon (NDB)
  - NDB Components.
- ☐ ADF Components
- ☐ Function of ADF
- ☐ Operational Errors of ADF
- ☐ Very High Frequency Omnidirectional Range (VOR).
- ☐ VOR Components
- ☐ Function of VOR
- ☐ VOR Operational Errors
- ☐ VOR Accuracy
- ☐ VOR Receiver Accuracy Check
- ☐ VOR Test Facility (VOT)
- ☐ Certified Checkpoints
- ☐ Distance Measuring Equipment (DME)
- ☐ DME Components
- ☐ Function of DME
- ☐ DME Arc
- ☐ Intercepting Lead Radials
- ☐ DME Errors
- ☐ Area Navigation (RNAV)
- ☐ VOR/DME RNAV
- ☐ VOR/DME RNAV Components
- ☐ Function of VOR/DME RNAV
- ☐ VOR/DME RNAV Errors

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 11: Navigation Systems (Part 2/2)

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)

- Chapter 9, Pages 24-48

AIM 1-1-9 through 1-1-20

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 9, Pages 24-48
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including the global navigation satellite system, GPS substitutes, determining position using various navigational methods, and GPS failures.

Lesson Elements:

Chapter 9

- ☐ Advanced Technologies.
- ☐ Global Navigation Satellite System (GNSS)
- ☐ Global Positioning System (GPS)
- ☐ GPS Components
- ☐ Function of GPS
- ☐ GPS Substitution
- ☐ GPS Substitution for ADF or DME
- ☐ To Determine Aircraft Position Over a DME Fix
- ☐ To Fly a DME Arc
- ☐ To Navigate TO or FROM an NDB/Compass Locator
- ☐ To Determine Aircraft Position Over an NDB/ Compass Locator
- ☐ To Determine Aircraft Position Over a Fix Made up of an NDB/Compass Locator Bearing
- ☐ Crossing a VOR/LOC Course
- ☐ To Hold Over an NDB/Compass Locator
- ☐ IFR Flight Using GPS
- ☐ GPS Instrument Approaches
- ☐ Departures and Instrument Departure Procedures (DPs)
- ☐ GPS Errors
- ☐ System Status
- ☐ GPS Familiarization
- ☐ Differential Global Positioning System (DGPS)
- ☐ Wide Area Augmentation System (WAAS)
    - General Requirements
- ☐ Instrument Approach Capabilities
- ☐ Local Area Augmentation System (LAAS)
- ☐ Inertial Navigation System
- ☐ Instrument Approach Systems

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 12: Stage 2 Exam

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)
Review elements from lessons 7-11, including terms and practice questions.

Presentation Format: Any combination of visual or oral means may be used to present the required information along with a 30-question multiple choice written exam.

Recommended Presentation Sequence:
Review stage two material - (0.5 hours)
Stage two exam- (1:00 Hour)
Correct stage two exam- (0.5 hours)

Lesson Objective: During this lesson, there will be a review of the material presented in class. Students will have the opportunity to ask questions. The stage two exam will be administered and corrected.

Lesson Elements: Stage two Exam

- Review stage key principle
- Aerodynamic factors
- Flight instruments
- Attitude instrument flying
- Basic flight maneuvers.

Administer stage two written exam.
Review and correct missed items

Completion Standards: By the end of the class period, the student will have completed the stage two exam with a minimum score of 70%. The instructor will review each incorrect response to ensure an adequate understanding of the missed material prior to proceeding to the next stage.

Stage Three

Stage Three Objectives:
During this stage, the student will be introduced to navigation systems, IFR flying including holding procedures, approaches, and instrument weather flying and emergency operations.

Stage Three Completion Standards:
Completion of this stage will be verified by passing the stage three final exam with a minimum score of 80%. The instructor will review each incorrect response to ensure an adequate understanding of the missed material prior to proceeding to the next stage.

Ground Lesson 13: IFR Flight (Part 1/2)

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)

- Chapter 10, Pages 1-15

14 CFR 91.167; 91.169 91.173; 91.180; 91.181; 91.211

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 10, Pages 1-15
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including sources of flight planning information, filing an IFR flight plan, IFR clearances, Departure, Enroute and holding procedures.

Lesson Elements:

Chapter 10

- ☐ Sources of Flight Planning Information
- ☐ Aeronautical Information Manual (AIM)
- ☐ Chart Supplement
- ☐ NOTAMs
- ☐ POH/AFM
- ☐ IFR Flight Plan
- ☐ Filing IFR Flight Plan in Flight
- ☐ Cancelling IFR Flight Plans
- ☐ IFR Fuel Requirements
- ☐ Clearances
- ☐ Examples
- ☐ Clearance Separations
- ☐ Clearance Shorthand
- ☐ Departure Procedures (DPs)
- ☐ Obstacles Departure Procedures (ODP)
- ☐ Standard Instrument Departures
- ☐ Radar-Controlled Departures
- ☐ Departures from Airports without an Operating Control Tower
- ☐ En Route Procedures
- ☐ ATC Reports
- ☐ Position Reports
- ☐ Additional Reports
- ☐ Planning the Descent and Approach
- ☐ Standard Terminal Arrival Routes (STARs)
- ☐ Substitutes for Inoperative or Unusable
- ☐ Components Supplemental Oxygen
- ☐ Holding Procedures.
- ☐ Standard Holding Pattern (No Wind)
- ☐ Standard Holding Pattern (With Wind)
- ☐ Holding Instructions
- ☐ Standard Entry Procedures
- ☐ Time Factors.
- ☐ DME Holding

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 14: IFR Flight (Part 2/2)

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)

- Chapter 10, Pages 13-22

14 CFR 91.175

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 10, Pages 13-22
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding all lesson elements including various instrument approaches, procedures, approach minimums, missed approaches and landing under IFR.

Lesson Elements:
Chapter 10

- Approaches
- Compliance With Published Standard Instrument Approach Procedures
- Instrument Approaches to Civil Airports
  - Approach to Airport without an Operating Control Tower
  - Approach to Airport with an Operating Control Tower, with No Approach Control
  - Approach to an Airport with an Operating Control Tower, with Approach Control
- Radar Approaches
- Radar Monitoring of Instrument Approaches
- Timed Approaches
- Approaches to Parallel Runways
- Side-step Maneuver
- Circling Approaches
- IAP Minimums
- Missed Approaches
- Landing
- Conducting and IFR Flight
  - Preflight
  - Departure
  - En Route
  - Arrival

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 15: Instrument Weather Flying Part 1/2

Study Assignment and Textual Reference(s):
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25C (as amended)

- Ch. 12, pages 1-25

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Pilot's Handbook of Aeronautical Knowledge Ch. 12
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding all lesson elements including meteorology, weather occurences, and weather conditions hazardous to IFR flight.

Lesson Elements:
Chapter 12

- ☐ The Atmosphere
- ☐ Composition of the Atmosphere, Circulation, and Pressure
- ☐ Coriolis Force
- ☐ Measurement of Atmosphere Pressure
- ☐ Altitude and Atmospheric Pressure
- ☐ Altitude and Flight
- ☐ Altitude and the Human Body
- ☐ Wind Currents and Patterns
- ☐ Convective Currents
- ☐ Effect of Obstructions on Wind
- ☐ Low-Level Wind Shear
- ☐ Wind and Pressure Representation on Surface Weather Maps
- ☐ Atmospheric Stability
- ☐ Inversion
- ☐ Moisture and Temperature
- ☐ Relative Humidity
- ☐ Temperature/Dew Point Relationship
- ☐ Methods by Which Air Reaches the Saturation Point
- ☐ Dew and Frost
- ☐ Fog
- ☐ Clouds
- ☐ Ceiling
- ☐ Visibility
- ☐ Precipitation
- ☐ Air Masses
- ☐ Fronts
- ☐ Thunderstorms
- ☐ Tornadoes
- ☐ Turbulence
- ☐ Icing
- ☐ Hail
- ☐ Ceiling and Visibility
- ☐ Effect on Altimeters
- ☐ Lightning

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 16: Instrument Weather Flying Part 2/2

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)

- Chapter 10, Pages 22-26

Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25C (as amended)

- Ch. 13, pages 1-24

AIM Ch. 7 Section 1

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Instrument Flying Handbook Chapter 10, Pages 22-26
Pilot's Handbook of Aeronautical Knowledge Ch. 13
AIM Ch. 7 Section 1
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including instrument weather flying, importance of recency, service outlets, weather advisories and forecasts.

Lesson Elements:

Chapter 10

- ☐ Instrument Weather Flying
  - Flying Experience
  - Recency of Experience
- ☐ VFR-on-Top vs VFR over-the-top

Chapter 13

- ☐ Service Outlets
- ☐ Weather Briefings
- ☐ Aviation Weather Reports
- ☐ Aviation Routine Weather Report (METAR)
- ☐ Pilot Weather Advisories
  - AIRMET
  - SIGMET
  - Convective SIGMET
- ☐ Winds and Temperature Aloft Forecast (FB)
- ☐ Weather Chart
- ☐ Surface Analysis Chart
- ☐ Weather Depiction Charts
- ☐ ATC Radar Weather Displays
- ☐ Weather Avoidance Assistance
- ☐ Electronic Flight Displays (EFD)/Multi-function Display (MFD) Weather
- ☐ Airborne Equipment and Ground Facilities
- ☐ Weather Conditions
- ☐ Radar/Satellite Observations

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 17: Emergency Operations

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)

- Chapter 11, Pages 1-12

14 CFR 91.183; 91.185; 91.187

Presentation Format: Any combination of visual or oral means may be used to present the required information.

Recommended Presentation Sequence: (2 hours)
Chapter 11, Pages 1-12
Lesson Quiz

Lesson Objective: During this lesson, the student will become familiar with and develop a basic understanding of all lesson elements including encountering adverse weather, system and instrument malfunctions and maintaining situational awareness.

Lesson Elements:
Chapter 11

- Unforecast Adverse Weather
  - Inadvertent Thunderstorm Encounter
  - Inadvertent Icing Encounter
  - Precipitation Static
- Aircraft System Malfunction
  - Electronic Display
  - Alternator/Generator Failure
  - Techniques for Electrical Usage
  - Loss of Alternator/Generator for Electronic Flight Instrumentation
  - Techniques for Electrical Usage
- Analog Instrument Failure
- Pneumatic System Failure
- Pitot/Static System Failure
- Communication/Navigation System Malfunction
- GPS Nearest Airport Function
  - Navigating the MFD Page Groups
  - Nearest Airport Page Group
  - Nearest Airports Soft Keys
- Situational Awareness
  - Traffic Avoidance

Completion Standards: By the end of the class period, the student will have completed the study assignment and demonstrated an understanding of all the lesson elements by completing the lesson quiz at the end of the lesson. The quiz will be reviewed and corrected to ensure a complete understanding of the missed material.

Ground Lesson 18: Final Exam

Study Assignment and Textual Reference(s):
Instrument Flying Handbook FAA-H-8083-15B (as amended)
Review all elements covered throughout the course, including terms, stage exams and practice questions.

Presentation Format: The final exam will be administered in-person during the class period as a comprehensive 60-question multiple choice written exam.

Recommended Presentation Sequence:
Administer Stage Three Exam- (2:00 hours)
Review and correct stage three exam- (0.5 hour)

Lesson Objective: During this lesson, students will have the opportunity to ask questions. The stage three exam will be administered.

Lesson Elements: Stage Three Exam
Stage Three written exam
Review and correct missed items

Completion Standards: The student will complete the final written exam with a minimum score of 80% to be considered eligible to receive a completion certificate and the instructor will review incorrect answers to ensure that the student understands the item(s) missed.

Ground Log Record

Lesson	Date	Topic of Instruction	Time	CFI Name/ No./ Exp
1			2	
2			2	
3			2	
4			2	
5			2	
6			2	
7			2	
8			2	
9			2	
10			2	
11			2	
12			2	
13			2	
14			2	
15			2	
16			2	
17			2	
18			2	