

<h1 style="margin: 0;">Instrument Rating Training Syllabus and Training Log</h1> <p style="margin: 0;">Version 2.0</p>
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## Training Overview

Student: \_\_\_\_\_

Instructor: \_\_\_\_\_

Date training started: \_\_\_\_\_

### AIRPORTS VISITED

- APC
- C83
- CCR
- DVO
- HAF
- HWD
- LVK
- MHR
- MOD
- MRY
- O69
- O88
- OAK
- PAO
- RHV
- SAC
- SCK
- SJC
- SMF
- SNS
- SQL
- STS
- TCY
- WVI
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

### Progress Checklist

- FAA knowledge test – score: \_\_\_\_\_
- Instrument phase check written exam
- Instrument phase check
- FAA checkride

### Minimum FAA Requirements Met

- 40 hours instrument reference training
- Long IFR cross-country
- 50 hours cross-country PIC

## Document References

A/FD	Airport/Facility Directory
ASF Course	AOPA Air Safety Foundation on-line course: <a href="http://www.aopa.org/asf">www.aopa.org/asf</a>
AW	Aviation Weather, AC 00-6A
AWS	Aviation Weather Services, AC 00-45E
FAR	FAA Federal Aviation Regulations
AIM	FAA Aeronautical Information Manual
IFH	FAA Instrument Flying Handbook, FAA-H-8083-15A
IPH	FAA Instrument Procedures Handbook, FAA-H-8261-1A
Machado	Rod Machado's Instrument Pilot's Handbook
PHAK	FAA Pilot's Handbook of Aeronautical Knowledge, FAA-H-8083-25
POH	Appropriate aircraft Pilot's Operating Handbook
PTS	Instrument Airplane Practical Test Standards, FAA-S-8081-4D

# Phase 1: Basic Instrument Flying – Sim

## LESSON 1 – Introduction

Completed: \_\_\_\_\_

### HOMEWORK

Assigned: \_\_\_\_\_

- Machado Chapter 1 (*Starting Your Instrument Training*)
- IFH Introduction
- FAR 91.123 (*Compliance with ATC clearance and instructions*)
- FAR 91.155 (*Basic VFR Weather Minimums*)
- FAR 91.157 (*Special VFR Weather Minimums*)
- FAR 91.173 (*ATC clearance and flight plan required*)

### HANDOUTS

- Instrument rating requirements
- Purchase list
- Syllabus

### GROUND

- Instrument rating requirements
- Use of simulator
- Use of hood
- Use of actual IMC weather
- Cross-country requirements
- Purchase list
- Syllabus
- Ground school
- Jeppesen vs. NACO charts
- DUAT/DUATS account
- When IFR is required (VFR minimums, SVFR, IFR clearance)

## LESSON 2 – Buying Supplies

Completed: \_\_\_\_\_

### HOMEWORK

Assigned: \_\_\_\_\_

- Buy:
  - IFH
  - IPH
  - PTS
  - PHAK
  - Machado
  - FAR/AIM
  - Enroute charts
  - Approach charts
  - AW
  - AWS
  - A/FD
  - POH
  - Kneeboard

## LESSON 3 – Decision Making and Physiology

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- Machado Chapter 4 (*Humans*)
  - IFH Chapter 1 (*Human Factors*)
  - AIM Chapter 8 (*Medical Facts for Pilots*)
  - FAR 91.3 (*Responsibility and authority of the Pilot in Command*)

### GROUND

- IFR decision making
- Hazardous attitudes
- Aeronautical Decision Making
- Human spatial orientation
- Spatial disorientation
- Hypoxia and CO poisoning
- Optical illusions
- Medical condition (IMSAFE)

## LESSON 4 – Instruments

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- Machado Chapter 2 (*Your Flight Instruments*)
  - IFH Chapter 3 (*Flight Instruments*)
  - IFH 11-3 to 11-8 (*Aircraft System Malfunctions*)
  - POH (*Systems*)
  - FAR 91.121 (*Altimeter settings*)

### GROUND

- Theory, interpretation, and failures of:
  - Vacuum system
  - Attitude indicator
  - Heading indicator
  - Electrical system
  - Turn coordinator
  - Static System
  - Altimeter
  - Vertical speed indicator
  - Pitot System
  - Airspeed indicator
- Compass

## LESSON 5 – Attitude Instrument Flying

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- Machado Chapter 3 (*A Plan for the Scan*)
  - IFH Chapter 2 (*Aerodynamic Factors*)
  - IFH Chapter 4 [section 1 or 2 as appropriate] (*Airplane Attitude Instrument Flying*)
  - IFH 5-1 to 5-26 (*Airplane Basic Flight Maneuvers: Analog Instrumentation*)
  - IFH 5-33 to 5-53 [if appropriate] (*Airplane Basic Flight Maneuvers: Electronic Flight Display*)

### GROUND

- Scan, interpretation, control
- Control and performance method
- Primary and supporting instruments
- Straight and level
- Turns
- Constant speed climbs and descents
- Constant rate climbs and descents
- Changing speed
- Triangles of agreement and instrument cross-check
- Standard performance

### FLIGHT

- Straight and level
- Turns
- Constant speed climbs and descents
- Constant rate climbs and descents
- Changing speed
- Analyzing the plane for standard performance
  - Vy climb
  - Cruise climb
  - Cruise level
  - Cruise descent
  - Approach level
  - Non-precision approach descent
  - Precision approach descent

## LESSON 6 – Transitions and Exercises

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- IFH 5-26 to 5-32 (*Airplane Basic Flight Maneuvers: Analog Instrumentation*)
- IFH 5-53 to 5-61 [if appropriate] (*Airplane Basic Flight Maneuvers: Electronic Flight Display*)

### GROUND

- 6 Ts
- Unusual attitude recovery
- Instrument takeoff

### FLIGHT

- Racetrack
- Procedure turn
- Teardrop turn
- Pattern A
- Pattern B
- Vertical S
- Steep turns
- Power-off stalls
- Power-on stalls
- Unusual attitude recovery
- Instrument takeoff

## LESSON 7 – Partial Panel

Completed: \_\_\_\_\_

### GROUND

- Vacuum failure [AHRS failure]
- Timed turns
- Compass turns

### FLIGHT

- Straight and level
- Climbs and descents
- Turns
- Racetrack
- Procedure turn
- Teardrop turn
- Pattern A
- Pattern B
- Vertical S
- Unusual attitude recovery

**LESSON 8 – The IFR System**

Completed: \_\_\_\_\_

**HOMEWORK**

Assigned: \_\_\_\_\_

- Machado Chapter 7 (*How the IFR System Works*)
- IPH Chapter 1 (*IFR Operations*)
- IFH Chapter 9 (*The Air Traffic Control System*)
- IFH 10-27 to end (*Conducting an IFR Flight*)
- Skim AIM 5-1 to 5-5 (*Air Traffic Procedures*)
- IPH Appendix B (*Staying Within Protected Airspace*)

**GROUND**

- Overview of IFR System
- Concept of protected airspace

**LESSON 9 – Enroute Charts**

Completed: \_\_\_\_\_

**HOMEWORK**

Assigned: \_\_\_\_\_

- Machado Chapter 15 (*IFR Enroute Charts*)
- AIM 5-3 (*En Route Procedures*)
- IFH 8-1 to 8-11 (*Airspace and Enroute Charts*)
- IPH Chapter 3 (*En Route Operations*)
- NACO/Jeppesen chart legend
- FAR 91.177 (*Minimum altitudes for IFR operations*)
- FAR 91.179 (*IFR cruising altitude*)
- FAR 91.181 (*Course to be flown*)

**GROUND**

- Enroute chart overview
  - Scale
- Navigation aids
  - VOR
- NDB
- Victor airways
  - Distances
  - Change-over point
  - MEA (and GPS MEA)
  - MOCA
  - MCA
- Intersections
  - DME distance
  - MRA
- T routes and Q routes
- Off route navigation and OROCA
- Airports and airport data
- Airspace
- Special use airspace
- MTRs
- FSS frequencies
- ARTCC boundaries and frequencies

**LESSON 10 – VOR Intercept and Tracking**

Completed: \_\_\_\_\_

**HOMEWORK**

- Assigned: \_\_\_\_\_
- Machado 5-1 to 5-18 (*Electronic Navigation: VORs*)
  - IFH 7-1 to 7-3 (*Radio Waves*)
  - IFH 7-8 to 7-17 (*VOR*)
  - AIM 1-1-3 to 1-1-6 (*VOR*)
  - AIM 1-1-8 (*Service Volume*)
  - AIM 1-1-12 to 1-1-14 (*Navaid IDs*)
  - FAR 91.171 (*VOR Equipment Check for IFR Operation*)

**GROUND**

- VOR check
- VOR tracking

**FLIGHT**

- VOR check
- VOR tracking full-panel
- VOR tracking partial-panel

**LESSON 11 – DME and DME Arcs**

Completed: \_\_\_\_\_

**HOMEWORK**

- Assigned: \_\_\_\_\_
- Machado 5-19 to 5-23 (*Electronic Navigation: DME*)
  - IFH 7-17 to 7-19 (*DME*)
  - AIM 1-1-7 (*DME*)
  - IPH 5-38 (*DME Arcs*)

**GROUND**

- DME operation
- DME ground speed
- DME arcs

**FLIGHT**

- Basic DME operation
- DME arcs full-panel
- DME arcs partial-panel

**LESSON 12 – NDB Intercept and Tracking**

Completed: \_\_\_\_\_

**HOMEWORK**

- Assigned: \_\_\_\_\_
- IFH 7-3 to 7-8 (*NDB/ADF*)
  - AIM 1-1-2 (*NDB*)

**GROUND**

- NDB tracking

**FLIGHT**

- NDB tracking full-panel
- NDB tracking partial-panel

## LESSON 13 – Enroute GPS Navigation

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- IFH 7-26 to 7-36 (*GPS*)
- IFH 7-46 to 7-48 (*Required Navigation Performance*)
- IPH Appendix A (*Airborne Navigation Databases*)
- AIM 1-1-19(a) to (n) (*GPS*)
- Appropriate GPS manual chapters

### GROUND

- GPS unit operation

### FLIGHT

- Basic GPS use
- Direct-to
- Flight plans
  - Direct-to
  - Activating legs
- DME arcs

## LESSON 14 – Clearances

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- IFH 10-3 to 10-5 (*Clearances*)
- AIM 4-4 (*ATC Clearances*)
- AIM 5-2-3 (*Abbreviated IFR Departure Clearance*)

### GROUND

- CRAFT
- As filed
- Direct
- Getting the clearance at a towered airport
- Pop-up clearances
- Verifying the clearance
- Setting up communications and navigation radios

## LESSON 15 – Departures

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- Machado Chapter 14 (*Instrument Departures*)
- AIM 5-2 (*Departure Procedures*)
- IFH 10-5 to 10-7 (*Departures*)
- IPH Chapter 2 (*Takeoffs and Departures*)

### GROUND

- Terrain clearance standards
- ODP
- SID
- Radar departure
- Diverse departure
- Departure minimums
- RNAV departures
- No published departure information

### FLIGHT

- Fly various clearances and departures

## LESSON 16 – Reports

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- IFH 10-7 to 10-8 (*Reports*)
- AIM 5-3-2 and 5-3-3 (*Position Reporting and Additional Reports*)
- FAR 91.183 (*IFR Radio Communication*)
- FAR 91.187 (*Operation Under IFR in Controlled Airspace: Malfunction Reports*)

### GROUND

- Radar reports
- Non-radar reports



**LESSON 17 – Holds**

Completed: \_\_\_\_\_

**HOMEWORK**

Assigned: \_\_\_\_\_

- Machado Chapter 6 (*Holding Patterns*)
- IFH 10-9 to 10-12 (*Holds*)
- IPH 3-23 to 3-26 (*Holding Procedures*)
- AIM 5-3-7 (*Holding*)

**GROUND**

- Purpose
- Holding clearance
- Holding procedure
  - Entering the hold
  - Flying the hold
  - Leaving the hold

**FLIGHT**

- Holds full-panel
- Holds partial-panel
- VOR holds
- Intersection holds
- NDB holds
- GPS holds

# Phase 2: Approaches – Sim

## LESSON 18 – Arrivals

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- Machado 12-35 to 12-37 (*Approach Chart Analysis: STARs*)
  - AIM 5-4-1 (*STARs*)
  - IFH 10-8 to 10-9 (*Planning the Descent, STARs*)
  - IPH Chapter 4 (*Arrivals*)

### GROUND

- STARs

## LESSON 19 – Approach Theory

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- Machado Chapter 11 (*Understanding Approach Charts*)
  - AIM Chapter 2 (*Aeronautical Lighting and Other Airport Visual Aids*)
  - AIM 5-4 (*Arrival Procedures*)
  - IFH 10-12 to 10-22 (*Approaches*)
  - IPH Chapter 5 (*Approach*)
  - FAR 91.175 (*Takeoff and landing under IFR*)
  - AIM 5-4-3 to 5-4-4 (*Approach Control*)
  - AIM 5-4-6 to 5-4-9 (*Approaches*)
  - AIM 5-4-18 (*Side Steps*)
  - AIM 5-4-19 (*Minimums*)
  - AIM 5-4-20 (*Missed Approach*)

### GROUND

- TERPs and obstacle clearance
- Approach segments
- Course reversal
- Circling approaches
- Side steps
- When to go missed
- Descending below MDA/DH
- Missed approach
- Non-precision approaches
- Precision approaches
- Approach and runway lights
- Runway markings

**LESSON 20 – Approach Plates**

Completed: \_\_\_\_\_

**HOMEWORK**

Assigned: \_\_\_\_\_

- IFH 8-13 to end (*Approach Charts*)
- AIM 5-4-5 (*IAP Charts*)
- NACO/Jeppesen approach plate legend

**GROUND**

- Approach plates
  - Communications frequencies
  - Plan view
  - Profile view
  - Minimums
  - Missed approach
- Airport diagrams

**LESSON 21 – Approach Setup**

Completed: \_\_\_\_\_

**GROUND**

- Chart and FDC NOTAMs
- Deciding on an approach
- Pre-approach checklist
- Briefing the approach
- Setting radios
- Pre-landing checklist

**LESSON 22 – VOR-Style Approaches**

Completed: \_\_\_\_\_

**HOMEWORK**

Assigned: \_\_\_\_\_

- Machado 5-35 to 5-40 (*Electronic Navigation: SDF, LDA, LORAN*)
- Machado 12-18 to 12-22 (*Approach Chart Analysis: LDA*)
- Machado 12-26 to 12-33 (*Approach Chart Analysis: VOR*)
- IFH 7-29 (*LOC*)
- IFH 7-45 (*SDF, LDA*)
- IPH 5-59 to 5-60 (*VOR Approach*)
- IPH 5-63 to 5-68 (*LOC, LDA SDF*)
- AIM 1-1-10 (*SDF*)

**GROUND**

- VOR
- LOC
- LOC BC
- LDA
- SDF
- Approach setup
- Approach flying procedure

**FLIGHT**

- VOR
- LOC
- LOC BC
- LDA
- SDF

**LESSON 23 – NDB Approaches**

Completed: \_\_\_\_\_

**HOMEWORK**

Assigned: \_\_\_\_\_

- Machado 5-48 to 5-58 (*Electronic Navigation: ADF*)
- Machado 12-22 to 12-26 (*Approach Chart Analysis: NDB*)
- IPH 5-60 to 5-61 (*NDB Approach*)

**GROUND**

- NDB approaches
- Approach setup
- Approach flying procedure

**FLIGHT**

- NDB approaches

**LESSON 24 – GPS Approaches**

Completed: \_\_\_\_\_

**HOMEWORK**

Assigned: \_\_\_\_\_

- Machado 5-41 to 5-47 (*Electronic Navigation: GPS*)
- Machado Chapter 13 (*GPS Approach Charts*)
- AIM 1-1-19(o) to (q) (*GPS*)
- AIM 1-1-20 (*WAAS*)
- AIM 1-2 (*RNAV and RNP*)
- IPH 5-44 to 5-50 (*RNAV Approaches*)
- Appropriate GPS manual chapters

**GROUND**

- GPS approaches
- GPS unit operation
- Approach setup
- Approach flying procedure

**FLIGHT**

- GPS approaches

**LESSON 25 – ILS Approaches**

Completed: \_\_\_\_\_

**HOMEWORK**

Assigned: \_\_\_\_\_

- Machado 5-23 to 5-35 (*Electronic Navigation: ILS*)
- Machado 12-1 to 12-18 (*Approach Chart Analysis: ILS*)
- AIM 1-1-9 (*ILS*)
- IPH 5-50 to 5-56 (*ILS*)
- IFH 7-37 to 7-45 (*ILS*)

**GROUND**

- ILS system
- ILS approaches
- ILS flying procedure
- Equipment substitution
- Inop approach lights and equipment

**FLIGHT**

- ILS approaches

# Phase 3: Flying the Airplane

## LESSON 26 – Weather

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- Machado Chapter 9 (*IFR Aviation Weather Theory*)
  - Machado Chapter 10 (*IFR Weather Charts*)
  - PHAK 10 (*Weather Theory*)
  - PHAK 11 (*Weather Reports, Forecasts, and Charts*)
  - AIM 7-1 (*Meteorology*)
  - IFH 10-22 to 10-26 (*Instrument Weather Flying*)
  - ASF Course – Weather Wise
  - ASF Course – SkySpotter
  - ASF Course – Thunderstorms: A Case Study

### GROUND

- Weather theory
- Important parts: clouds, visibility, turbulence, icing
- FSS briefings
- DUATS
- Other weather sources
- Predicting thunderstorms
- Predicting turbulence
- Predicting ice
- Predicting fog
- Use of FSS/EFAS in the air

## LESSON 27 – Preflight and Cockpit Organization

Completed: \_\_\_\_\_

### HOMEWORK

- Assigned: \_\_\_\_\_
- IFH 3-34 to 3-27 (*Preflight*)
  - FAR 91.21 (*Portable Electronic Devices*)
  - FAR 91.205 (*Powered Civil Aircraft with Standard Category U.S. Airworthiness Certificates: Instrument and Equipment Requirements*)
  - FAR 91.215 (*ATC Transponder and Altitude Reporting Equipment and Use*)
  - FAR 91.411 (*Altimeter System and Altitude Reporting Equipment Tests and Inspections*)
  - FAR 91.413 (*ATC Transponder Tests and Inspections*)

### HANDOUT

- Preflight checklist

### GROUND

- Required inspections
- Required equipment
- Instrument preflight items
- Lapboard organization
- Timer

**LESSON 28 – Flying the Airplane** Completed: \_\_\_\_\_**FLIGHT**

- Spatial disorientation demo
- Straight and level
- Constant rate climbs and descents
- Constant airspeed climbs and descents
- Turns
- Changing airspeed
- Analyzing the plane for standard performance
- Partial panel
- VOR tracking
- DME arcs
- NDB tracking
- GPS operation
- Holds

**LESSON 29 – Other Maneuvers** Completed: \_\_\_\_\_**HOMEWORK**

- Assigned: \_\_\_\_\_
- IFH 5-22 to 5-28 (*Steep Turns, Stalls, Unusual Attitudes*)

**FLIGHT**

- Steep turns
- Power-off stalls
- Power-on stalls
- Unusual attitudes full-panel
- Unusual attitudes partial-panel

**LESSON 30 – Approaches** Completed: \_\_\_\_\_**FLIGHT**

- VOR
- LOC
- LDA
- GPS
- ILS
- NDB

# Phase 4: Cross-Country Flights and Miscellaneous

## LESSON 31 – Planning a Long IFR Flight

Completed: \_\_\_\_\_

### HOMEWORK

Assigned: \_\_\_\_\_

- Machado Chapter 16 (*IFR Flight Planning*)
- AIM 5-1 (*Preflight*)
- FAR 91.167 (*Fuel Requirements for Flight in IFR Conditions*)
- FAR 91.169 (*IFR Flight Plan: Information Required*)

### GROUND

- Planning the departure
- Planning the arrival
- Planning the enroute portion based on terrain and weather
- Preferred/TEC routes
- Alternates
- Filing the flight plan
- Receiving clearances
  - Clearance delivery
  - Ground
  - Non-towered

## LESSON 32 – Other Approaches and Clearances

Completed: \_\_\_\_\_

### HOMEWORK

Assigned: \_\_\_\_\_

- Machado 12-33 to 12-35 (*Approach Chart Analysis: Contact and Visual*)
- IFH 10-26 to 10-27 (*VFR on Top*)
- IPH 5-43 to 5-44 (*Contact and Visual Approaches*)
- IPH 5-61 to 5-63 (*Radar Approaches*)
- AIM 5-4-10 (*Timed Approaches*)
- AIM 5-4-11 (*Radar Approaches*)
- AIM 5-4-21 (*Visual Approach*)
- AIM 5-4-22 (*Charted Visual Flight Procedures*)
- AIM 5-4-23 (*Contact Approach*)

### GROUND

- Visual approach
- Charted visual flight procedures
- Contact approach
- VFR-on-top
- Cruise clearance
- Block altitudes
- Timed approaches from a hold
- PAR/ASR approaches
- No-gyro approach

**LESSON 33 – Emergencies**

Completed: \_\_\_\_\_

**HOMEWORK**

- Assigned: \_\_\_\_\_
- IFH 11-1 to 11-3 (*Adverse Weather*)
  - IFH 11-8 to 11-15 (*Communication/Navigation System Malfunction*)
  - FAR 91.185 (*IFR operations: Two-way radio communications failure*)
  - DVD: NASA In-Flight Icing Training for Pilots

**GROUND**

- Communications failure
- Equipment failure
- Pitot-static failure
- Alternator failure
- Total electrical failure
- Low fuel
- Icing
  - Anti-icing systems
  - De-ice systems
- Weather

**FLIGHT**

- Zero-zero takeoff
- Zero-zero approach
- Simulated communications failure

**LESSON 34 – Final Issues**

Completed: \_\_\_\_\_

**HOMEWORK**

- Assigned: \_\_\_\_\_
- Machado Chapter 17 (*IFR Pilot Potpourri*)
  - FAR 61.51 (*Pilot Logbooks*)
  - FAR 61.57(c) (*Recency of Experience: Pilot in Command*)
  - ASF Course – IFR Adventure: Rules to Fly By
  - ASF Course – Single-Pilot IFR

**GROUND**

- Logging instrument time
- Safety pilots
- IFR currency
- Personal minimums