CFI Bootcamp
Flight Instructor Training

INSTRUMENT FLIGHT

INSTRUCTOR LESSON PLANS

First Edition

IFR Lesson Plans

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First Edition
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Mike Shiflett's Aviation credentials and experience are as follows:

FAA Certificates
Airline Transport Pilot Certificate – Airplane Muli-Engine Land. CE-525 Type rating
Commercial Pilot Privileges: Airplane Single Engine Land and Sea
Flight Instructor Certificate – Airplane Single and Multi-Engine Land, Instrument Airplane
Former FAA Designated Pilot Examiner – Recreational – ATP including Initial CFI, CFII, MEI

UK Certificates
Commercial Pilot – Airplane Single Engine Land
Former UK Flight Examiner for Private Pilot and IMC ratings

Mike has amassed over 16,000 hours of which most was in general aviation aircraft. He also adminis-tered around 3,000 practical tests (Checkrides) for the FAA.

Mike has authored numerous courses used by top flight schools and Universities in his previous company. At CFI Bootcamp he authored all the course content including 42 hours of video, 10 books used by students at CFI Bootcamp and has been featured in many aviation media organizations. He has also presented at EAA Airventure – Oshkosh, WI, Sun-n-Fun and Aviation conferences as a speaker. He also produced a Podcast "Flight Training the way I see it", and has a weekly webinar called "The Power Hour". The CFI Bootcamp website has links to the webinar and previous Podcasts.

He continues to innovate in the aviation industry and is particularly focused on creating courses and training materials to produce better flight instructors.

Mike currently lives in both San Jose, CA and more often in Miami Beach, FL. He flies from the Opa Locka airport just north of Miami International.

Introduction

These lesson plans cover every area of operation for both the Flight Instructor Instrument Airplane PTS and the knowledge areas for the Instrument Airplane ACS.

The lesson plans can be used in two ways:

1. Read and do exactly what is described (This method works if it's been a while, or you are newly minted CFII).
2. Use it as a checklist. Read the elements of the lesson plan in order.

The lesson plans include many references such as specific FAR's, Chapters of the AIM and so on. They are built into the lesson plan, so you don't have to look them up.

Remember that a lesson plan is to be sure you cover all of the content and budget enough time to complete the lesson. Lesson plans are not for the student, until the lesson is over. Giving a lesson plan to the student or projecting it will not deliver a better lesson. The student will begin reading the lesson plan while you are talking and not hear what you are saying. Once you deliver the lesson you can give the student a copy or go over any additional items.

Practice teaching these lessons aloud. You'll be able to hear, and fix, any problems with the flow or the content of the lesson.

I hope that you find these lesson plans useful for your checkride and when teaching students. I have been working on these for a long time and I'm sure they will work for you and save you an enormous amount of time.

Mike Shiflett – Miami Beach, FL - November 20, 2021

AEROMEDICAL FACTORS

Objective

To become familiar with Aeromedical factors.

Motivation

It's almost a sure thing that you will have a passenger who exhibits a medical symptom from being in the air. Knowing how to identify what they are having trouble with and then taking the corrective action is why you need to understand Aeromedical factors.

Presentation: 45 Minutes

What it is	Causes	Symptoms	Corrective actions
Hypoxia	Lack of oxygen	Headache, Dizziness, Numbness in extremities, Cyanosis	Lower altitude or supplemental oxygen
Hyperventilation	Not enough CO2, Nervousness, Anxiety, Fright	Clammy sweaty skin, rapid breathing	Breath More Slowly
Middle ear and sinus problems	Inflammation, Disease, Cold / Flu	Pain due to pressure difference	Valsalva method, Clear ears, descend more slowly
Spatial Disorien-tation	Loss of horizon or visual reference	Loss of control, Confusion of airplane attitude	Use the flight instruments
Motion Sickness	Motion not matching visual cues	Clammy skin, Pale color, hot, Nausea	Look out to the horizon, climb to avoid turbulence, Open ventilation, Sick sack
Carbon monoxide poisoning	Hypoxia caused by CO.	Same as hypoxia except red extremities in the later stages	Turn off heater, land, ventilate cabin
Stress and fatigue	Chronic or Acute	Delayed reaction, not thinking well, Fatigued, Loss of Muscle control	Acute - Rest and eliminate stress Chronic – Under care of physician
Dehydration	Loss of water or electrolytes	Loss of balance or muscle control, Confu-sion, Disorientation	Restore electrolytes and hydrate

Alcohol	Produces hypoxia like symptoms and dehydration	8 hrs. before last drink, 0.04% BAC, Not under the influence	Wait
Drugs	Prescription vs. Non prescription	Varies	Use AOPA guide to drugs
Scuba – Nitrogen	Nitrogen excess	Produces the bends	24 hours waiting for a controlled ascent, 12 for non-controlled ascent

Completion Standards

This lesson is complete when the student demonstrates a basic understanding of aeromedical factors during oral quizzing and completion of homework exercises.

References

Airplane Flying Handbook (FAA-H-8083-3a)
FAR / AIM (FAA-H-8083-25B)
NTSB reports
Personal stories
FAA-S-ACS-6B

REGULATIONS AND PUBLICATIONS RELATED TO IFR OPERATIONS

OBJECTIVE

For the pilot to have a working knowledge of the regulations and publications available so the pilot can compeletly with any regulatory requirement.

MOTIVATION

Understanding the regulations and publications keeps the pilot in compliance with any regulatory requirement.

PRESENTATION: 60 MINUTES

1. Review of general content of FAR Part 61, 71, 91 and 97:
    a. Part 61 – Certification requirements (61.65) and saying current (61.57).
    b. Part 71 – Designation of A, B, C, D, and E airspace. Review 71.1 – 71.71 and 71.901.
    c. Part 91 – General operating and flight rules. Review IFR regulations (91.167 – 91.187), 91.205.
    d. Part 97 – Standard instrument procedures. Review (97.1 – 97.5).
2. FAR 91.175 - Emphasize when a pilot can descend below DA/MDA using the approach lighting system only – Can descend 100 feet above touchdown zone elevation with any approach lighting system. May descend further if using an ALSF-1 or 2 because they have either red terminating lights or red side bar lights.
3. Use AC 61-65 to see a CFII can do the following:
    a. Endorse for the instrument knowledge test
    b. Endorse for an instrument rating practical test
    c. Endorse for completion of an Instrument proficiency check (IPC)
    d. Endorse to authorize an IGI to teach IFR ground.
    e. Endorse for an initial CFII rating if the CFII meets the requirements (61.195(h)).

f. Endorse for an additional rating (CFII) on a flight instructor certificate.

4. A CFII may also provide the 10 hours of instrument training required for a Commercial Pilot Certificate (61.129(a)(3)(i).

Instrument Flying Handbook – FAA-H-8083-15:

1. Show the general content of the handbook by chapter.
2. Updated as needed – No set schedule

Aeronautical Information Manual (AIM):

1. Assign reading of Chapters 4 and 5 of the AIM. Instruct the student to read over the sections that are new to them, or they have not used in a while. It typically takes an hour for each chapter.
2. Review all other parts of the AIM, Chapters 1-3 and 6-9 to show what's in each chapter.
3. Show the student Appendix 3 in the AIM – Abbreviations/Acronyms for use when needed.
4. Updated every 4 weeks

Practical Test Standards (PTS) and Airman Certification Standards (ACS):

1. Instruct the student that the PTS is valid for Flight Instructor Instrument Airplane and there are special emphasis areas and other important information that appear before the required Areas of Operation. Review all areas of operation prior to the practical test.
2. For use with an Instrument Rating or IPC show the student the required tasks and review it prior to the practical test. The appendix contains important information such as the use of autopilot, loss of primary flight instruments, performing a non-radar vectored approach etc. There are also tables in the appendix that show what will be tested for a pilot who holds an instrument rating in another category and wants to add an instrument rating to airplane single ending land. For conducting an IPC there is a table showing the required tasks.
3. The PTS is not currently being updated. The ACS is updated as needed with not set schedule.

Chart Supplements (Airport Facility Directory in the CFII PTS):

1. Issued every 56 days.
2. Contains chart NOTAMS, airport information, Navigational Aid information and Hot Spots.
3. Explain how to use the Chart Supplements by using the legend and decoding at least one airport information page and chart NOTAM.

Standard Instrument Departures/Terminal Arrivals:

1. Explain what a SID, Obstacle departure procedure (ODP), and diverse vector area are. ODP and diverse vector areas are shown in the terminal approach procedures pack under Takeoff minimums, (Obstacle) departure procedures, and diverse vector area (Radar Vectors) or under the airport information button in ForeFlight and then departure. Note that on FAA charts SIDS

are not to scale and can't be geo referenced. Jeppesen charts are to scale and can be geo referenced. Note that weather Takeoff minimums don't apply but the required climb gradients apply. If no climb gradient is specified, the default is 200ft/nm. Also, no turns can be made below 400 AGL. (AIM 5-2-9).

2. Updated every 28 days.

En Route Charts:

1. Review the legend with the student. Any symbol on any chart can be found in the Aeronautical chart users guide at faa.gov.
2. Review the following key points on the En Route Chart:
    a. Issued every 28 days
    b. No terrain is shown
    c. MEAs – Minimum enroute altitude – Shown on airways as an MSL altitude above the line indicating the airway. It provides navigation coverage over the entire airway and terrain clearance of 2000 feet in mountainous areas and 1000 feet in non-mountainous areas.
    d. MOCAs – Minimum obstruction clearance altitude -are shown below the MEA as a MSL altitude with an asterisk (*) before the number. The MOCA provides 2000 feet of terrain clearance in mountainous areas and 1000 feet in non-mountainous areas, but navigation is only within 22 miles of the VOR defining the airway.
    e. A map of the designated non-mountainous and mountainous areas is in the AIM 5-6-16.
    f. MCA – Minimum crossing altitude – Flag with an X in the flag. You must cross the fix at or above this altitude.
    g. MRA – Minimum reception altitude – The minimum altitude you need to be at to identify this fix. A flag it at the fix or navaid with the letter R on the flag.
    h. Airways – Navigation aid types and frequencies to use. Radials/course depiction, Fixes with no MEA change, fixes with an MEA change (T-marking), Airway distances: Total, to a fix, from fix to fix.
    i. OROCA – Off route obstruction clearance altitude – Used when not on an airway. Denoted in brown numbers in the middle of each quadrant of longitude and latitude lines. Provides 2000 feet of terrain clearance in mountainous areas and 1000 feet in non-mountainous areas.
    j. Airports: Green have instrument approach procedure(s), Blue have instrument approach procedure(s) and have military function. Examples are: Beale Airforce base – Not available to civil aircraft. Fresno Yosemite airport – Mixed use – one side is Air force the other is civilian. Brown do not have any instrument approaches.

Standard Instrument Approach Procedure Charts

1. Used to connect to the enroute chart and provide an instrument procedure that allows an airplane to land at an airport.
2. Published every 28 days.
3. Paper versions have Non-Standard Alternate Minimums in the front of the pack. There are also,

sections for Takeoff Minimums, (Obstacle) Departure Procedures and Diverse Vector Areas (Radar Vectors). The rest of the book contains the instrument approach procedures that are available to the airports that have them in the geographical area.

4. Show the student the city name, type of the approach and other FAA designators around the perimeter of the chart. Also shown are the effective and expiration date of the chart.

   NOTE: Jeppesen doesn't show an expiration date. They require a subscription and therefore say that if your subscription is current you have current charts.

5. Show the briefing strip and how its organized to be in the typical order you need.
6. Show the plan view. Explain that the plan view is North up and there can be shading to show terrain. Show what items are on the briefing strip that are also on the plan view.
7. Show the profile view. Show symbology about altitudes, what an asterisk (*) (or hashtag (#) means. Show the missed approach dashed line.
8. Show the iconic missed approach.
9. Show the minimums section and explain how to determine the category for the airplane to be flown (FAR 97.3). Show the inoperative components of an approach lighting system table in the front of the book and how to apply corrections to the printed minimums.
10. Show the airport diagram and show an example of ground speed to time to determine the missed approach point on some non-precision approaches.

RISK MANAGEMENT

As this is a technical subject area for Flight Instructor Instrument Airplane and there is currently not an ACS available, there are no risk management tasks.

COMPLETION STANDARDS

To determine the applicant exhibits instructional knowledge of the elements related to regulations and publications (related to instrument flight instruction) their purpose, general content, availability, and method of revision

LOGBOOK ENTRIES RELATED TO INSTRUMENT INSTRUCTION

U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Certification: Pilots and Flight and Ground Instructors | **Date:** 8/27/18 | **Initiated by:** AFS-800 | **AC No:** 61-65H | **Change:**

OBJECTIVE

To understand the logbook entries, regulatory requirements and endorsements for recommendation for an Instrument Rating, IPC, Initial CFII rating, additional flight instructor rating, ground instructor authorization, and the required flight instructor records.

MOTIVATION

As a CFII you will are permitted to do all of the above training and recommendations.

PRESENTATION: 30 MINUTES

NOTE: As a CFII you will are permitted to do all of the above training and recommendations.

1. AC 61-65: Certification: Pilots and Flight and Ground Instructors.
2. Logging training time in a logbook or training record (61.51).
3. Logging simulated and actual instrument conditions of flight (61.51).
4. Logging PIC time for a pilot who is rated in the same category and class while receiving dual instruction – Can log PIC even in the clouds if they are sole manipulator of the flight controls (61.51).
5. Preparation of endorsements and recommendation for an Instrument Rating:
    a. FAR 61.65 details the requirements
    b. AC 61-65 provides the sample endorsements to be given:
        i. Knowledge test
        ii. Flight proficiency
        iii. Training within 2-calendar months of the practical test
        iv. Prepared for the practical test
        v. Resolved the deficient areas found on the knowledge test
6. Endorsement for successful completion of an instrument proficiency check (IPC).

a. FAR 61.57(c) and (d) address recency of experience and IPC requirements.
b. Instrument rating airplane ACS in the appendix shows the required tasks.
c. AC 61-65 provides the sample endorsement to give.

7. Preparation of endorsements and recommendation for a Intial Flight Instructor – CFII
    a. Limitations – You must meet the requirements of 61.195(h).
    b. AC 61-65 provides the sample endorsements to be given:

i. Fundamentals of instructing
ii. Knowledge tests (FOI and FII)
iii. Flight proficiency
iv. Spin endorsement
v. Training withing 2-calendar months of the practical test
vi. Prepared for the practical test
vii. Resolved the deficient areas found on the knowledge tests.

8. Preparation of endorsements and recommendations for the addition of an instrument rating on an existing flight instructor certificate.
    a. Not subject to the limitations of 61.195(h) – Not an initial certificate.
    b. AC 61-65 provides the sample endorsements to be given:
        i. Knowledge test
        ii. Flight proficiency
        iii. Training within 2-calendar months of the practical test
        iv. Prepared for the practical test
        v. Resolved the deficient areas found on the knowledge test
9. Endorsement for Recent Experience Requirements of an Instrument Ground Instructor.
    a. FAR 61.217 addresses what must be done – A new IGI needs this endorsement.
    b. AC 61.65 provides the sample endorsement to give:
        i. Ground Instructor that does not meet the recent experience requirements.
10. Flight Instructor Records:
    a. 61.189 – The only records that need to be kept for a CFII are:
        i. Any person endorsed for a knowledge or practical test and the result of the tests.
        ii. Must be kept in a logbook or training record for at least 3 years.
        iii. Ground instruction and flight instruction must be logged in the students logbook or training record any time you give it.

RISK MANAGEMENT

1. There are no risk management tasks as this is a PTS requirement for Flight Instructor Instrument Airplane.

COMPLETION STANDARDS

1. To determine that applicant exhibits instruction knowledge of logbook entries related to instrument instruction by describing:
    a. Logbook entries or training records for instrument flight/instrument flight instruction or ground instruction given.
    b. Preparation of a recommendation for an instrument rating practical test, including the appropriate logbook entry.
    c. Required endorsement of a pilot logbook for satisfactory completion of an instrument proficiency check.
    d. Required flight instructor records.

PILOT QUALIFICATIONS

OBJECTIVE

To determine how a pilot can meet the certification and recency of experience requirements to act as pilot in command (PIC) of an airplane under instrument flight rules.

MOTIVATION

Every IFR pilot needs to know when they can accept and file an IFR flight plan and act as PIC under IFR.

PRESENTATION: 20 MINUTES

1. The addition of an instrument rating allows a pilot to fly in other than VFR weather subject to any limitations on airplane performance and visibility requirements for instrument approach procedures or departure procedures.
2. A pilot must be at least 17 years old and hold at least a Private Pilot Certificate.
3. A pilot needs a 3rd class medical or higher, or Basic Med.
4. Aeronautical experience requirements are found in FAR 61.65(c). Certification requirements for an Instrument Rating for Airplane Single Engine Land:
    a. 50-hours of cross-country time as pilot in command (Not required for 141 programs)
    b. 40 hours of actual or simulated instrument time of which 15 hours must have been received from a CFII and that time includes:
        i. Three hours of instrument flight training within 2 calendar months of the practical test
        ii. Instrument training on cross-country procedures including one cross country flight with a CFII performed under instrument flight rules, when a flight plan has been filed with an ATC facility and that involves:
            1. A flight of 250 nautical miles along airways or by directed routing from an ATC facility
            2. An instrument approach at each airport
            3. Three different kinds of approaches with the use of navigation systems
5. A full motion simulator or aviation training device may be used for up to 20 hours of the 40 re-

quired provided a CFII provides that training. FAR 61.65(h) and (i).

6. Aeronautical knowledge required is found in FAR 61.65(b). A knowledge test and an endorsement to take it is required. The passing score is at least 70%.
7. Flight proficiency required is found in FAR 61.65(c).
8. A pilot must be endorsed and must pass a practical test.

Recency of experience to act as PIC of an airplane under IFR – FAR 61.57(c):

1. Must within the last 6 months have done the following:
   a. 6 approaches
   b. Holding procedures and tasks
   c. Intercepting and tracking courses using navigational electronic systems
2. If this has not been done the pilot has another 6 months to meet the recency of experience requirements by using an appropriately rated safety pilot or with a CFII
3. If it has been over one year since the pilot was current an Instrument Proficiency Check (IPC) from a CFII, DPE or FAA Inspector is required (FAR 61.57(d). The required tasks are in the appendix of the Instrument Rating Airplane ACS.
4. A flight training device may be used to remain or regain currency within the one-year period. This does not have be done with a CFII.
5. Pilots are required to log any time that proves that they meet an aeronautical experience requirement or have received an IPC.

RISK MANAGEMENT

1. Failure to distinguish proficiency versus currency.
2. Failure to set personal minimums.
3. Failure to ensure fitness for flight and physiological factors that might affect the pilot's ability to fly under instrument conditions.
4. Flying unfamiliar airplanes or operating with unfamiliar flight display systems and avionics

COMPLETION STANDARDS

1. Apply requirements to act as PIC under Instrument Flight Rules (IFR) in a scenario given by the evaluator.