The Pilot's Manual

Instrument Rating Syllabus

Sixth Edition

A Flight & Ground Training Course for
the Instrument Rating based on
The Pilot's Manual: Instrument Flying
Meets Part 61 and 141 Requirements

by Jackie Spanitz

Includes Appendix for using an ATD as a loggable training device.

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Contents

About this Syllabus iii
Compliance Tables v
Enrollment/Graduation Certificates vii

Stage 1 **Instrument Flight** **1**
Module 1 2
Module 2 3
Module 3 4
Module 4 5
Module 5 6
Optional Review 7

Stage 2 **Navigation** **8**
Module 1 9
Module 2 10
Module 3 11
Module 4 12
Module 5 13
Optional Review 14

Stage 3 **Holding Procedures** **15**
Module 1 16
Module 2 17
Module 3 18
Module 4 19
Module 5 20
Optional Review 21

Stage 4 **Instrument Approaches** **22**
Module 1 23
Module 2 24
Module 3 25
Module 4 26
Module 5 27
Optional Review 28

Stage 5 **En Route & Prep for Checkride** **29**
Module 1 30
Module 2 31
Module 3 32
Module 4 33
Module 5 34
Optional Review 35
Instrument Rating Endorsements and Checkride List 36

Airman Certificate Application FAA Form 8710-1 37
Stage Exams 1–5 43–58
Stage Exam Figures 59–76
Aviation Training Device (ATD) Syllabus 77–86

About This Syllabus

Course Objective:

The objective of this syllabus is for the student to gain the necessary aeronautical skill, knowledge and experience to meet the requirements of an Instrument Rating with an Airplane category and a Single-Engine Land class rating.

Prerequisites:

The student must be able to read, speak, write, and understand the English language, meet the physical standards for a third-class medical certificate, and possess either a Private Pilot or Commercial Pilot certificate with an Airplane category and Single-Engine Land class rating.

Experience Requirements for an Instrument Rating Include:

35 hours of instrument experience for §141 (40 hours for §61 programs, 15 hours of which must be with an Instrument Instructor)
50 hours cross-country PIC (§61 programs)
30 hours of ground training (no minimum time is specified for §61 programs)

Instrument Rating Course:

The Instrument Rating is made up of 2 requirements: Aeronautical Skill and Aeronautical Knowledge. This syllabus is written to satisfy 14 CFR §141 requirements. With the addition of 5 instrument training flight hours and 50 hours cross-country PIC experience, this syllabus will be equally effective for 14 CFR §61 programs. The syllabus is organized into five Stages, with five Modules in each Stage. Each stage must be completed in ____ days, not to be more than 90 days. Each Module contains both a flight and ground lesson. This presents an integrated flight training process and will promote easier learning and a more efficient flight training program. Ideally, the ground lesson will be completed prior to the flight.

Testing Procedures:

Each module contains a reading assignment associated with the ground training program. The review questions following each chapter will test the student's understanding of the material covered throughout the ground lesson, and must be answered prior to moving on to the next module. A Stage Exam is included with each stage, testing the student on both the ground and flight training material covered throughout the stage. This exam must be passed with a minimum score of 80%, and reconciled to 100%, in order to proceed to the next Stage.

It is essential that the objective of each module be accomplished before moving on to the next module. Instructors are responsible for ensuring the completion standards have been. It may require multiple meetings and/or flights for the student to complete all tasks to the defined standards.

Minimum Requirements:

The time necessary for the syllabus to qualify for §141 operations includes meeting 35 hours of instruction experience (40 hours for §61 programs, 15 of which must be with an Instrument Instructor), and 30 hours of ground instruction. This is a *minimum* time—many factors play into the finishing flight time: frequency of flying, cooperative weather, airplane and instructor scheduling, and lapses in the flight training process. It is recommended the student fly at least twice a week. This type of schedule produces the most efficient training, and cuts down on review time. If there is a lapse in between flights, it may be necessary to review maneuvers; use the optional review flights accompanying each Stage for this purpose (this will allow the student to continue following the syllabus, which is necessary for a 141 program). Students are also encouraged to maintain training proficiency with a Aviation Training Device (ATD). See Appendix 6 for details on integrating this technology into the training curriculum. The student should feel comfortable performing each task in all previous modules before progressing to the next stage. If student exceeds more than ____ hours of the minimum 141 recommended time allotted per module, the chief flight instructor must be informed.

Note: Although there is no requirement for instrument solo flight, it is suggested the student perform IFR procedures with a safety pilot for additional practice. See 14 CFR § 91.109 for Safety Pilot requirements.

Aviation Training Devices

The Federal Aviation Administration has formally recognized the potential of computer-based training devices for use in general aviation instrument flight training curricula. A qualified Aviation Training Device (ATD) is highly beneficial when used under the guidance of an authorized instructor to obtain the aeronautical knowledge and skills required for an instrument rating. See Appendix 6 for details on implementing ATDs into an integrated flight and ground training instrument curriculum.

Although federal aviation regulations require only 35 hours of instrument flight training for an instrument rating, the national average training time is closer to 65 hours. ATDs are superb instructional tools, taking the teaching process out of a hostile environment (the training airplane) and putting it on the computer. All aspects of the training curriculum should be taught to some performance level on the ground before demonstrating competence in the airplane. This positive transfer of learning will greatly reduce the flying hours spent working on earning the instrument rating.

Required Materials for the Instrument Rating Course:

- *Ground School* (#ASA-PM-2)
- *Instrument Flying* (#ASA-PM-3)
- ASA FAR/AIM (#ASA-FR-AM-BK, updated annually)

Recommended Materials for the Instrument Rating Course:

- FAA Instrument Airman Certification Standards (referred to as ACS; replaces PTS) (#ASA-ACS-8)
- ASA *Instrument Rating Test Prep* book (#ASA-TP-I), Prepware software (#ASA-TW-I), or Virtual Test Prep DVD Ground School (#ASA-VTP-I)
- ASA *Instrument Oral Exam Guide* (#ASA-OEG-I)
- ASA Flight computer (E6-B or CX-2 Pathfinder)
- ASA Instrument Plotter (#ASA-CP-IFR)
- View limiting device such as Jiffyhood (#ASA-H2G), or Overcasters (#ASA-OVC)
- ASA Flightlogs for cross-country flights (#ASA-FP)
- Low Altitude Enroute Chart for local area
- Sectional for local area
- Chart Supplements (previously Airport/Facility Directory)

The syllabus uses *The Pilot's Manual: Instrument Flying* for the ground training program. The review following each chapter should be finished with the assigned reading. This text contains an index which will help pinpoint the material for the subject you are working on. ASA's *Instrument Rating Test Prep* is recommended to enhance the program. The prep will ensure the student is completely prepared for the FAA Knowledge Exam upon completion of the course. Instructors using this syllabus must ensure current Airman Certification Standards are upheld and the procedures outlined in the *Instrument Flying Handbook* (FAA-H-8083-15) are maintained at all times.

If you have any comments or questions on how to best use this syllabus, please call ASA at 1-800-ASA-2-FLY. We will be happy to provide suggestions on how to tailor this syllabus to specifically meet your training needs. Note to Instructors: Answers to the Stage Exams are available to instructors by calling 1-800-ASA-2-FLY, or you can fax your request on letterhead to 1-425-235-0128.

Instrument Rating Minimum Course Hours

For Part 141, Appendix C Compliance

These times are for student/instructor guidance only. They are a suggested time schedule which will ensure minimum flight and ground training compliance with 14 CFR §141. To follow a §61 curriculum, add 5 hours of instrument training, for a total of 40 hours. Also, §61 instrument rating applicants are requred to have 50 hours cross-country PIC time.

Note: Ground Instruction should include classroom discussion, and pre- and post-flight briefings.
The stage exams may not be credited for more than 5 hours of the 30 hours of required ground training, and the stage checks may not be credited for more than 5 hours of the required 35 hours of flight training.

Page		Ground Instruction	Dual Instrument Flight	Dual Instrument Cross-Country	Done ✔
01	**Stage 1**				
02	Module 1	1.5	1.5		
03	Module 2	1.0	1.0		
04	Module 3	1.0	1.0		
05	Module 4	1.0	1.0		
06	Module 5	1.5 + Stage Exam	1.5 + Stage Check		
07	** Review*	*1.5*	*1.5*		
08	**Stage 2**				
09	Module 1	1.5	1.5		
10	Module 2	1.0	1.0		
11	Module 3	1.0	1.0		
12	Module 4	1.0	1.0		
13	Module 5	1.5 + Stage Exam	1.5 + Stage Check		
14	** Review*	*1.5*	*1.5*		
15	**Stage 3**				
16	Module 1	1.5	1.5		
17	Module 2	1.0	1.0		
18	Module 3	1.0	1.0		
19	Module 4	1.0	1.0		
20	Module 5	1.5 + Stage Exam	1.5 + Stage Check		
21	** Review*	*1.5*	*1.5*		
22	**Stage 4**				
23	Module 1	1.5	1.5		
24	Module 2	1.0	1.0		
25	Module 3	1.0	1.0		
26	Module 4	1.5	1.5		
27	Module 5	1.5 + Stage Exam	1.5 + Stage Check		
28	** Review*	*1.5*	*1.5*		
29	**Stage 5**				
30	Module 1	1.5	2.0	2.0	
31	Module 2	1.0	2.0	2.0	
32	Module 3	1.5	3.5	3.5	
33	Module 4	1.0	1.5		
34	Module 5	1.5 + Stage Exam	1.5 + Stage Check		
35	** Review*	*1.5*	*1.5*		
	TOTALS	30.0 + Stage Exams	35.0 + Stage Checks	7.5	

** Reviews are not necessary to meet §141 compliance, and are not counted in the TOTALS for the program. They are optional, and should be used if the student is not ready to move on to the next module.*

Part 141 Appendix C Compliance

These are the aeronautical knowledge subjects and flight tasks required for §141 compliance and where they are covered within this syllabus.

	Part 141 Appendix C — Ground Training	Covered in Syllabus
1	Applicable Federal Aviation Regulations for IFR flight operations	Stage 3, Module 2
2	Appropriate information in the Aeronautical Information Manual	Stage 3, Module 2
3	Air traffic control system and procedures for instrument flight operations	Stage 3, Module 3
4	IFR navigation and approaches by use of navigation systems	Stage 2, all Modules
5	Use of IFR en route and instrument approach procedure charts	Stage 4, Module 1
6	Procurements and use of aviation weather reports and forecasts, and the elements of forecasting weather trends on the basis of that information and personal observation of weather conditions	Stage 3, Module 4
7	Safe and efficient operation of aircraft under instrument flight rules and conditions	Stage 5, Modules 1, 2, 3
8	Recognition of critical weather situations and windshear avoidance	Stage 2, Module 4 Stage 3, Modules 4 and 5 Stage 5, Module 2
9	Aeronautical decision making and judgment	Stage 3, Module 3
10	Crew resource management, to include crew communication and coordination	Stage 3, Module 3

Part 141 Appendix C — Flight Training	Covered in Syllabus
35 hours of instrument training	Stages 1-5, all modules
Dual instruction from an instrument instructor that includes one cross-country flight in airplane single-engine land	Stage 5 Modules 1, 2, 3
One dual cross-country at least 250 NM along airways or ATC-directed routing with one segment of the flight consisting of at least a straight-line distance of 100 NM between airports and includes (1) An instrument approach at each airport, (2) 3 different kinds of approaches with the use of navigation systems	Stage 5 Module 3

Enrollment Certificate

This is to certify that

_____

Student Name

is enrolled in the Federal Aviation Administration approved **Instrument Rating Course**, conducted by

_____

School and Certificate Number

_____ _____

Chief Instructor *Date of Enrollment*

Graduation Certificate

This is to certify that

_____

Pilot Name and Number

has satisfactorily completed each required stage of the approved course of training including the tests for those stages, and has received _____ hours of cross-country training.

_____ has graduated from the Federal Aviation Administration approved **Instrument Rating Course** conducted by

_____

School and Certificate Number

_____ _____

Chief Instructor *Date of Graduation*

Stage 1
Instrument Flight

Objective

The objective of Stage 1 is for the student to become proficient in, and have an understanding of the following:

Ground Training

- Course objective
- School requirements, procedures, regulations
- Grading criteria
- Instrument scan techniques
- IFR Instruments
- Straight-and-level flight
- Straight climb and descent
- Turning
- Unusual flight attitudes
- Normal instrument flight on a partial panel
- Training maneuvers used for instrument flight

Flight Training

- Flight training process
- Training airplane
- Instrument preflight
- Aircraft systems related to IFR operations
- Instrument cockpit check
- Flight by reference to instruments:
  - straight-and-level flight
  - change of airspeed
  - constant airspeed climbs and descents
  - rate climbs and descents
  - timed turns to magnetic compass headings
  - Steep Turns
  - recovery from unusual flight attitudes
- Loss of gyro attitude and/or heading indicators
- Checking instruments and equipment post flight

Note: The patterns used in this Stage can be found in *Instrument Flying*, Chapter 9.

Completion Standards

Stage 1 is complete when the student achieves the objective of each lesson, and can list or describe the correct process or reference for accomplishing elements, exercises and activities. Student shall score at least 80% on the Stage 1 Exam, and all deficient areas shall be reconciled to 100%.

Stage 1 / **Module 1**

Minimum 141 Requirements: Dual, Instrument
1.5 hours flight
1.5 hours ground instruction

Ground Training

Objective:

For the student to have an understanding of the Instrument Rating course, and instrument scanning techniques.

Content:

- Review of course and objectives
- School requirements, procedures, regulations
- Grading criteria, expectations of student
- Review objective of Stage 1

Instrument scanning technique

- Selective radial scan
- Basic T-scan
- Other scans

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Introduction and Chapters 1 and 2

This lesson may be completed using ATD Lesson 1.
See Appendix 6.

Flight Training

Objective:

For the student to be introduced to the Instrument Rating course and become familiarized with the training airplane, instrument preflight, and straight-and-level instrument flight.

Content:

- Discussion of flight training process
- Introduction to the training airplane
- Instrument preflight inspection and aircraft documents
- Use of checklists
- Normal takeoff
- Instrument scan
- Straight-and-level flight
- Pattern A (see Chapter 9, *Instrument Flying*)
- Pattern B (see Chapter 9, *Instrument Flying*)
- Pattern C (see Chapter 9, *Instrument Flying*)
- Radar vectors, VOR approach (demonstrated)
- Postflight

Completion Standards:

This lesson is complete when the student can conduct an efficient instrument preflight and scan, and can maintain altitude within 200 feet, airspeed within 20 knots, and heading within 20 degrees, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

Stage 1 / **Module 1**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 1 / **Module 2**

Minimum 141 Requirements: Dual, Instrument
1.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to gain an understanding of the aircraft instruments used in instrument flight, and the concept of flying straight-and-level under instrument conditions.

Content:

Instruments

- Attitude indicator
- Power indicators
- Airspeed indicator
- Heading indicator
- Altimeter
- Vertical speed indicator
- Turn coordinator and turn indicator
- Magnetic compass
- Clock
- Pitot-static system
- Gyroscopes
- Preflight checks of flight instruments
- PFD (if training aircraft warrants)

Straight-and-level flight

- Control instruments
- Performance instruments
- 3 fundamentals of instrument flying
- Trimming
- Cruise speeds vs. pitch attitudes
- Maintaining heading
- Maintaining altitude
- Recovering from slightly unusual attitudes
- Coping with a faulty attitude indicator
- Power vs. speed
- Changing configuration

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapters 3 and 4

Flight Training

Objective:

For the student to become acquainted with the aircraft systems related to IFR operations, the instrument cockpit check, and to become proficient in flight by reference to instruments while maintaining changes of airspeed, and constant airspeed climbs and descents.

Content:

- Discussion of aircraft systems related to IFR operations
- Instrument cockpit check and preflight
- Normal takeoff
- Instrument scan
- Straight-and-level flight
- Standard rate turns
- Demonstrate effects of change of airspeed
- Constant airspeed climbs and descents
- Pattern D (see Chapter 9, *Instrument Flying*)
- Pattern E (see Chapter 9, *Instrument Flying*)
- Pattern F (see Chapter 9, *Instrument Flying*)
- Radar vectors, ILS approach (demonstrated)
- Postflight

Completion Standards:

This module is complete when the student can effectively control the airplane within 200 feet, 20 degrees, and 20 knots, and perform standard rate turns, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

This lesson may be completed using ATD Lesson 2.
See Appendix 6.

Stage 1 / **Module 2**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 1 / **Module 3**

Minimum 141 Requirements: Dual, Instrument
1.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to gain an understanding of the straight climb and descent, and turning during instrument flight.

Content:

The straight climb

- Climbing at different airspeeds
- Variations on entering the climb
- Climbing at a particular rate
- Climbing into clouds after takeoff

The straight descent

- Climbing away from a descent
- Descending at a particular rate
- The precision approach

Turning

- Bank angle and rate of turn
- Roll-in and roll-out rate
- The medium level turn
- Instrument turns to a specific heading
- Climbing turns
- Descending turns
- Steep Turns
- Steep level turn
- Steep descending turn

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapters 5 and 6

This lesson may be completed using ATD Lesson 3.
See Appendix 6.

Flight Training

Objective:

For the student to become proficient in performing Steep Turns and Slow Flight solely by reference to instruments, and understand the process of checking the instrument and equipment postflight.

Content:

- Preflight inspection
- Normal takeoff
- Standard rate turns
- Slow Flight
- Steep Turns
- Pattern I (see Chapter 9, *Instrument Flying*)
- Pattern E (see Chapter 9, *Instrument Flying*)
- Radar vectors, nonprecision approach (demonstrated)
- Postflight, checking instruments and equipment

Completion Standards:

This module is complete when the student can perform Steep Turns, Slow Flight solely by reference to instruments, and postflight procedures, and can maintain flight within 150 feet, 15 degrees, 15 knots, and 5 degrees of bank angle, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

Stage 1 / **Module 3**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 1 / **Module 4**

Minimum 141 Requirements: Dual, Instrument
1.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to have an understanding of recognizing and recovering from unusual attitudes.

Content:

Unusual attitudes

- Recognizing an unusual attitude
- Nose-low attitudes with increasing airspeed
- Nose-high attitude with decreasing airspeed
- Nose-high and approaching the stall

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 7

This lesson may be completed using ATD Lesson 4.
See Appendix 6.

Flight Training

Objective:

For the student to become proficient at performing timed turns to magnetic compass headings, and constant rate climbs and descents, flying solely by reference to instruments.

Content:

- Preflight
- Soft-field takeoff
- Standard rate turns
- Steep Turns
- Slow Flight
- Power on/off Stalls
- Timed turns to magnetic compass headings
- Pattern G (see Chapter 9, *Instrument Flying*)
- Pattern H (see Chapter 9, *Instrument Flying*)
- Systems and equipment malfunctions
- ASR approach (with tower or the instructor)
- Postflight procedures

Completion Standards:

This module is complete when the student can maintain flight within 150 feet, 15 degrees, and 15 knots, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

This lesson may be completed using ATD Lesson 5.
See Appendix 6.

Stage 1 / **Module 4**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 1 / **Module 5 and Stage Check**

Minimum 141 Requirements: Dual, Instrument
1.5 hours flight
Stage check
1.5 hours ground instruction
Stage exam

Ground Training

Objective:

For the student to gain an understanding of normal instrument flight on a partial panel and the maneuvers used in instrument flight training.

Content:

Normal instrument flight on a partial panel

- Interpreting pitch attitude on a partial panel
- Interpreting bank attitude on a partial panel
- Straight flight on a partial panel
  - straight-and-level flight on a partial panel
  - climbing on a partial panel
  - descending on a partial panel
- Turning on a partial panel
- Recovery from unusual attitudes on a partial panel

Training maneuvers

- Seven-Ts
- Performance sheets
- Warm-ups
- Maneuvers (A-K)

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading. Stage 1 Exam must be passed with a minimum score of 80% and reconciled to 100%.

Assignment:

Instrument Flying, Chapters 8 and 9
Stage 1 Exam

This lesson may be completed using ATD Lesson 6.
See Appendix 6.

Stage 1 / **Module 5**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage Exam Score: _____

Stage Check Successful: _____

Aircraft _____ **ATD** _____ **Other** _____

Flight Training

Objective:

For the student to become proficient in recovery from unusual flight attitudes, and partial panel flight. For the Stage Check, student should demonstrate skill in the following areas according to the completion standards.

Content:

- Preflight inspection
- Aircraft systems related to IFR operations
- Instrument cockpit check
- Short-field takeoff
- Straight-and-level flight
- Change of airspeed
- Constant airspeed climb and descents
- Rate climbs and descents
- Standard rate turns
- Steep Turns
- Slow Flight
- Power on/off Stalls
- Timed turns to headings
- Recovery from unusual flight attitudes
- Partial panel practice using patterns B and G
- Pattern J (see Chapter 9, *Instrument Flying*)
- Pattern H (see Chapter 9, *Instrument Flying*)
- Radar vector approach, instructor assisted
- Checking instruments and equipment postflight

Completion Standards:

This module is complete when the student can recover from unusual flight attitudes, and fly partial panel. Student should maintain flight within 150 feet, 15 degrees, 15 knots, and 5 degrees of bank angle, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Rating Test Prep, Chapters 3 and 4
Instrument Flying

Optional **Stage 1 Review**

Lesson Time: Dual, Instrument
1.5 hours flight, or whatever is necessary to meet objective
1.5 hour ground instruction, or whatever is necessary to meet objective

Flight Training

Objective:

For the student to review all Stage 1 tasks and meet all objectives.

Content:

- Preflight inspection
- Aircraft systems related to IFR operations
- Instrument cockpit check
- Short-field takeoff
- Straight-and-level flight
- Change of airspeed
- Constant airspeed climbs and descents
- Rate climbs and descents
- Standard rate turns
- Steep Turns
- Slow Flight
- Power on/off Stalls
- Timed turns to headings
- Recovery from unusual flight attitudes
- Partial panel practice using patterns B and G
- Pattern J (see Chapter 9, *Instrument Flying*)
- Pattern H (see Chapter 9, *Instrument Flying*)
- Radar vector approach, instructor assisted
- Checking instruments and equipment postflight

Completion Standards:

This module is complete when the student can recover from unusual flight attitudes, and fly partial panel. Student should maintain flight within 150 feet, 15 degrees, 15 knots, and 5 degrees of bank angle, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

Optional **Stage 1 Review**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 2
Navigation

Objective

The objective of Stage 2 is for the student to become proficient in and have an understanding of the following:

Ground Training

- Radio navigation aids
- Radar
- DME
- The NDB and ADF
- The Relative Bearing Indicator (RBI)
- The Radio Magnetic Indicator (RMI) and rotatable-card ADF
- The VOR
- The Instrument Landing System (ILS)
- GPS

Flight Training

- ATC Clearances
- Ground-based navigation
- GPS navigation
- Intercepting and tracking VOR/VORTAC radials or NDB bearings and DME arcs
- Low Altitude Enroute chart use
- Airway use

Completion Standards

Stage 2 is complete when the student achieves the objective of each lesson and can list or describe the correct process or reference for accomplishing elements, exercises, and activities. Student shall score at least 80% on the Stage 2 Exam, and all deficient areas shall be reconciled to 100%.

Stage 2 / **Module 1**

Minimum 141 Requirements: Dual, Instrument
1.5 hours flight
1.5 hours ground instruction

Ground Training

Objective:

For the student to be introduced to radio navigation aids and gain an understanding of radar.

Content:

- Review objective of Stage 2

Introduction to radio navigation aids

Radar

- Radar vectoring
- Radar approaches
- Surveillance approaches
- PAR approaches
- No-gyro approaches
- Using the transponder
- How radar works

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 10

Flight Training

Objective:

For the student to become oriented with VOR homing and tracking procedures and to become proficient in ATC clearances.

Content:

- Preflight inspection
- Air Traffic Control clearances
- VOR, VOT accuracy checks
- TO-FROM and CDI orientation/use
- Homing a VOR radial
- Tracking a VOR radial
- Effects of wind on VOR use
- Tracking outbound/reverse sensing
- Determining station passage
- ASR approach, full panel (instructor assisted)
- Postflight procedures

Completion Standards:

This module is complete when the student can communicate effectively with ATC, home and track using VOR radials, perform VOR accuracy checks, and orient himself/herself using a VOR. Flight should be maintained within 150 feet altitude, 15 knots airspeed, and 15 degrees heading, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

Stage 2 / **Module 1**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 2 / **Module 2**

Minimum 141 Requirements: Dual, Instrument
1.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to gain an operational understanding of DME and the VOR.

Content:

DME

- DME measures slant distance
- DME uses the principle of secondary radar
- DME frequencies
- VOR/DME pairing
- ILS/DME pairing
- DME arcs

VOR

- VOR radial
- How the VOR works
- The range of a VOR
- VORs on aeronautical charts
- VOR/DME, TACAN, VORTAC
- VOR cockpit instrument
- TO or FROM
- Preparing the OBI for use
- Orientation using the VOR
- Tracking using the VOR
- Intercepting a course using the VOR
- Other presentations of the VOR
- The VOR instrument approach

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapters 12 and 14

This lesson may be completed using ATD Lesson 7.
See Appendix 6.

Flight Training

Objective:

For the student to become proficient at VOR navigation and intercepting and tracking VOR/VORTAC radials and DME arcs.

Content:

- Preflight
- ATC clearances
- VOR/VOT accuracy checks
- VOR navigation techniques
- Homing a VOR radial
- Intercepting and tracking VOR/VORTAC radials
- DME arcs
- VOR full approach (instructor assisted)
- Postflight procedures

Completion Standards:

This module is complete when the student can navigate using VORs, and can intercept and track VOR/VORTAC radials and DME arcs. Flight should be maintained within 150 feet altitude, 15 knots airspeed, and 15 degrees heading, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

This lesson may be completed using ATD Lesson 8.
See Appendix 6.

Stage 2 / **Module 2**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 2 / **Module 3**

Minimum 141 Requirements: Dual, Instrument
1.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to gain an operational understanding of the NDB and ADF, the relative bearing indicator (RBI), the radio magnetic indicator (RMI), and the rotatable-card ADF.

Content:

The NDB and the ADF

- The Automatic Direction Finder
- The ADF Cockpit Display

The Relative Bearing Indicator (RBI)

- Operational use of the RBI
- Tracking
- The NDB approach

The Radio Magnetic Indicator (RMI) and Rotatable-card ADF

- Orientation using the RMI
- The initial interception of course
- Maintaining course

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 11

This lesson may be completed using ATD Lesson 9.
See Appendix 6.

Flight Training

Objective:

For the student to become proficient with NDB navigation and intercepting and tracking NDB bearings.

Content:

- Preflight
- ATC clearances
- ADF orientation
- NDB navigation
- Homing with an NDB
- Tracking with an NDB
- Intercepting NDB bearings
- Nonprecision full approach (instructor assisted)
- Postflight procedures

Completion Standards:

This module is complete when the student can navigate using the NDB, and intercept and track NDB bearings. Flight should be maintained within 150 feet altitude, 15 knots airspeed, and 15 degrees heading, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

This lesson may be completed using ATD Lesson 10.
See Appendix 6.

Stage 2 / **Module 3**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 2 / **Module 4**

Minimum 141 Requirements: Dual, Instrument
1.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to gain an operational understanding of the Instrument Landing System (ILS).

Content:

Instrument Landing System (ILS)

- The Localizer
  - flying the Localizer
  - flying the Localizer with an HSI
- The Glideslope
  - flying the glideslope
- Marker Beacons
  - other means of checking glideslope
- Approach lights and other lights
  - approach light systems (ALS)
  - visual approach slope indicator (VASI)
  - runway lighting
  - taxiway lights
  - control of lighting systems
- Precision instrument runway markings
- Inoperative ILS components
- Flying a typical ILS
- International terminology
- Simultaneous approaches
- The sidestep maneuver
- The localizer-type directional aid (LDA)
- The simplified directional facility (SDF)
- Windshear on the approach
  - windshear terminology
  - windshear effects on an aircraft's flightpath
  - the causes of windshear

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 13

This lesson may be completed using ATD Lesson 11.
See Appendix 6.

Flight Training

Objective:

For the student to be introduced to Low Altitude Enroute chart use and to become proficient with Time to Station problems, VOR navigation, DME arcs, NDB navigation, GPS navigation, and intercepting NDB bearings and VOR radials.

Content:

- Preflight
- ATC clearances
- Low Altitude Enroute chart orientation and use
- DME arcs
- VOR navigation
- NDB navigation
- GPS navigation
- Intercepting and tracking VOR radials
- Intercepting and tracking NDB bearings
- NDB time to station problems
- VOR time to station problems
- ILS full approach (instructor assisted)
- Postflight procedures

Completion Standards:

This module is complete when the student can understand and apply the techniques used in DME arcs, VOR navigation, NDB navigation, and low altitude enroute chart use, and accurately perform VOR and NDB Time to Station problems. Flight should be maintained within 150 feet altitude, 15 knots airspeed, and 15 degrees heading, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

Stage 2 / **Module 4**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 2 / **Module 5 and Stage Check**

Minimum 141 Requirements: Dual, Instrument
1.5 hours flight
Stage check
1.5 hours ground instruction
Stage exam

Ground Training

Objective:

For the student to gain an operational understanding of RNAV.

Content:

RNAV

- Pseudo-VORTACs
- DPs and approaches
- GPS

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading. Stage 2 Exam must be passed with a minimum score of 80% and reconciled to 100%.

Assignment:

Instrument Flying, Chapter 15
Stage 2 Exam

Flight Training

Objective:

For the student to review how to home, track, and intercept VOR and NDB radials/bearings, navigate using VORs, NDBs, or GPS, comply with ATC clearances, correctly use a Low Altitude Enroute chart, and be introduced to airway use. For the Stage Check, student should demonstrate skill in the following areas according to the completion standards.

Content:

- Preflight
- ATC clearances
- VOR/VOT accuracy check
- VOR navigation
- NDB navigation
- Intercepting and tracking VOR radials
- Intercepting and tracking NDB bearings
- Low Altitude Enroute chart use and orientation
- Airway orientation with instruments and charts
- Standard rate turns
- Steep Turns
- Slow Flight
- Power on/off Stalls
- Timed turns to headings
- Recovery from unusual flight attitudes
- Partial panel practice using patterns B and G
- Full approach, instructor assisted
- Postflight procedures

Completion Standards:

This lesson is complete when the student can perform all maneuvers listed in the content of this module, while maintaining VOR and NDB navigation within 2 dots or 5 degrees of course, and altitude within 100 feet, heading within 10 degrees, and airspeed within 10 knots.

Recommended Reading:

Instrument Flying
Instrument Rating Test Prep, Chapter 8

Stage 2 / **Module 5**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage Exam Score: _____

Stage Check Successful: _____

Aircraft _____ **ATD** _____ **Other** _____

Optional **Stage 2 Review**

Lesson Time: Dual, Instrument
1.5 hours flight, or whatever is necessary to meet objective
1.5 hour ground instruction, or whatever is necessary to meet objective

Flight Training

Objective:

For the student to review all Stage 2 tasks and meet all objectives.

Content:

- Preflight
- ATC clearances
- VOR/VOT accuracy check
- VOR navigation
- NDB navigation
- GPS navigation
- Intercepting and tracking VOR radials
- Intercepting and tracking NDB bearings
- Low Altitude Enroute chart use and orientation
- Airway orientation with instruments and charts
- Standard rate turns
- Steep Turns
- Slow Flight
- Power on/off Stalls
- Timed turns to headings
- Recovery from unusual flight attitudes
- Partial panel practice using patterns B and G
- Full approach, instructor assisted
- Postflight procedures

Completion Standards:

This lesson is complete when the student can perform all maneuvers listed in the content of this module, while maintaining VOR and NDB navigation within 2 dots or 5 degrees of course, and altitude within 100 feet, heading within 10 degrees, and airspeed within 10 knots.

Recommended Reading:

Instrument Flying

Optional **Stage 2 Review**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 3
Holding Procedures

Objective

The objective of Stage 3 is for the student to become proficient in and have an understanding of the following:

Ground Training

- Holding patterns
- Procedure turns
- DME arcs
- Regulations pertaining to the instrument pilot
- Preparation for instrument flight
- Icing
- Visibility

Flight Training

- Holding procedures:
  - entries to holds
  - holding at VORs
  - holding at NDBs
  - holding at intersections
  - partial panel holds
  - holding speeds
- Compliance with departure, en route, and arrival procedures and clearances
- Filing an IFR flight plan

Completion Standards

Stage 3 is complete when the student achieves the objective of each lesson, and can list or describe the correct process or reference for accomplishing elements, exercises and activities. Student shall score at least 80% on the Stage 3 Exam, and all deficient areas shall be reconciled to 100%.

Stage 3 / **Module 1**

Minimum 141 Requirements: Dual, Instrument
1.5 hours flight
1.5 hours ground instruction

Ground Training

Objective:

For the student to gain an understanding of holding patterns, procedure turns, and DME arcs.

Content:

- Review objective of Stage 3

Holding patterns

- Tracking
- Corrections for wind
- Entering a holding pattern
- Holding speeds

Procedure turns

- The 45°/180° procedure turn
- The 80°/260° procedure turn
- The base turn, or teardrop turn
- Positioning in a racetrack pattern

DME Arcs

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 28

This lesson may be completed using ATD Lesson 12.
See Appendix 6.

Flight Training

Objective:

For the student to be introduced to entries to holds and holding at VORs.

Content:

- Instrument preflight
- Holding instruction
- Perform three holds at a VOR
  - Direct entry, standard turns
  - Parallel entry, nonstandard turns
  - Teardrop entry, standard turns
- VOR approach, radar vectors (instructor assisted)
- Postflight procedures

Completion Standards:

This module is complete when the student has an understanding of entries to holds, and can perform a hold using a VOR. Student should maintain altitude within 150 feet, airspeed within 15 knots, and heading within 15 degrees, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

This lesson may be completed using ATD Lesson 13.
See Appendix 6.

Stage 3 / **Module 1**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 3 / **Module 2**

Minimum 141 Requirements: Dual, Instrument
1.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to understand the federal aviation regulations which pertain to the instrument pilot.

Content:

Regulations pertaining to the instrument pilot

- Federal Aviation Regulations
- Aeronautical Information Manual
- Responsibility and authority of the PIC
- What is IFR?
- Am I qualified to fly IFR today?
- Is the airplane suitable for IFR?
- IFR operations

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 24
FAR/AIM

Flight Training

Objective:

For the student to become proficient at holding entry procedures, performing standard and nonstandard holding patterns, complying with departure, en route, and arrival procedures and clearances, and filing an IFR flight plan.

Content:

- Instrument preflight
- Departure procedures
- File an IFR flight plan
- Comply with departure, en route, and arrival procedures and clearances
- Perform 3 VOR holds, using direct, parallel, and teardrop entries
- Demonstrate both standard and nonstandard holding patterns
- Perform 1 VOR hold, using partial panel
- ILS approach, radar vectors (instructor assisted)
- Postflight procedures

Completion Standards:

This module is complete when the student can accurately hold at a VOR using the proper entry procedure and timing techniques, maintaining orientation to whereabouts at all times. Student must maintain altitude within 150 feet, airspeed within 15 knots, and heading within 15 degrees, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

Stage 3 / **Module 2**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 3 / **Module 3**

Minimum 141 Requirements: Dual, Instrument
1.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to understand the preparation necessary for an instrument flight.

Content:

Preparation for flight

- Preflight considerations for an IFR flight
- En Route charts
  - airports
  - navigation aids
  - routes
  - airspace
  - communications
- Flight planning
  - the flight plan
- Human factors
  - Aeronautical decision making
  - Judgement
  - Crew resource management, to include crew communication and coordination

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 25
Ground School, Chapter 12

Flight Training

Objective:

For the student to become proficient in performing holds at an NDB.

Content:

- Instrument preflight
- Departure procedures
- File an IFR flight plan
- Perform NDB hold, standard and nonstandard turns
- Perform NDB hold, partial panel
- Review VOR holding procedures
- Nonprecision full approach (instructor assisted)
- Postflight procedures

Completion Standards:

This module is complete when the student can perform holds at an NDB using the correct entry and timing procedures, maintaining orientation to whereabouts at all times. Student must maintain altitude within 150 feet, airspeed within 15 knots, and heading within 15 degrees, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

This lesson may be completed using ATD Lesson 14.
See Appendix 6.

Stage 3 / **Module 3**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 3 / **Module 4**

Minimum 141 Requirements: Dual, Instrument
1.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to gain an understanding of IFR meteorology, specifically icing.

Content:

Icing

- Structural Icing
  - clear ice
  - rime ice
  - mixed (or cloudy) ice
  - frost
  - structural icing and cloud type
- Induction Icing
  - carburetor icing
  - engine intake icing
- Some hints to the pilot flying in icing conditions

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 20

Flight Training

Objective:

For the student to perform partial panel and intersection holds.

Content:

- Instrument preflight
- File an IFR flight plan
- VOR hold, partial panel
- Intersection hold, partial panel
- NDB hold, partial panel
- VOR full approach (instructor assisted)
- Postflight procedures

Note: Students should practice a different entry technique with each hold.

Completion Standards:

This module is complete when the student can perform VOR, Intersection, and NDB holds using a partial panel, maintaining orientation to whereabouts at all times. Student must maintain altitude within 150 feet, airspeed within 15 knots, and heading within 15 degrees, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

Stage 3 / **Module 4**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 3 / **Module 5 and Stage Check**

Minimum 141 Requirements: Dual, Instrument
1.5 hours flight
Stage check
1.5 hours ground instruction
Stage exam

Ground Training

Objective:

For the student to gain an understanding of IFR meteorology, specifically visibility.

Content:

Visibility

- Inversions and reduced visibility
- Condensation
- Fog
  - radiation fog
  - advection fog
  - upslope fog
  - frontal fog
  - steam fog

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading. Stage 3 Exam must be passed with a minimum score of 80% and reconciled to 100%.

Assignment:

Instrument Flying, Chapter 18
Stage 3 Exam

Flight Training

Objective:

For the student to review VOR, Intersection, NDB—standard and nonstandard—holds, with both full and partial panel; and instrument flying maneuvers. For the Stage Check, student should demonstrate skill in the following areas according to the completion standards.

Content:

- Instrument preflight
- File IFR flight plan
- Comply with departure, en route, and arrival procedures and clearances
- VOR hold
- Intersection hold
- NDB hold
- Slow Flight
- Steep Turns
- Power on/off Stalls
- ILS full approach (instructor assisted)
- Postflight procedures

Note: Students should demonstrate holds using all entry procedures and full and partial panel proficiency.

Completion Standards:

This module is complete when the student can perform VOR, Intersection, and NDB holds, demonstrating all entry procedures, standard and nonstandard patterns, and full and partial panel proficiency. Student must maintain altitude within 100 feet, airspeed within 10 knots, and heading within 10 degrees, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying
Instrument Rating Test Prep, Chapter 5

Stage 3 / **Module 5**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage Exam Score: _____

Stage Check Successful: _____

Aircraft _____ **ATD** _____ **Other** _____

Optional **Stage 3 Review**

Lesson Time: Dual, Instrument
1.5 hours flight, or whatever is necessary to meet objective
1.5 hour ground instruction, or whatever is necessary to meet objective

Flight Training

Objective:

For the student to review all Stage 3 tasks and meet all objectives.

Content:

- Instrument preflight
- File IFR flight plan
- Comply with departure, en route, and arrival procedures and clearances
- VOR hold
- Intersection hold
- NDB hold
- Slow Flight
- Steep Turns
- Power on/off Stalls
- ILS full approach (instructor assisted)
- Postflight procedures

Note: Students should demonstrate holds using all entry procedures and full and partial panel proficiency.

Completion Standards:

This module is complete when the student can perform VOR, Intersection, and NDB holds, demonstrating all entry procedures, standard and nonstandard patterns, and full and partial panel proficiency. Student must maintain altitude within 100 feet, airspeed within 10 knots, and heading within 10 degrees, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Instrument Flying

Optional **Stage 3 Review**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 4
Instrument Approaches

Objective

The objective of Stage 4 is for the student to become proficient in and have an understanding of the following:

Ground Training

- Instrument approaches
- Instrument departures
- Visual maneuvering
- Clouds
- Thunderstorms
- High-level meteorology

Flight Training

- VOR/VORTAC instrument approach procedure
- Nonprecision instrument approach procedure
- Precision instrument approach procedure
- Missed approach procedures
- Circling approach procedures
- Landing from a straight-in or circling approach procedure
- Localizer instrument approach procedure
- Localizer back-course approach
- Instrument approaches from holds
- Partial panel approaches
- Loss of communications

Completion Standards

Stage 4 is complete when the student achieves the objective of each lesson, and can list or describe the correct process or reference for accomplishing elements, exercises and activities. Student shall score at least 80% on the Stage 4 Exam, and all deficient areas shall be reconciled to 100%.

Stage 4 / **Module 1**

Minimum 141 Requirements: Dual, Instrument
1.5 hours flight
1.5 hours ground instruction

Ground Training

Objective:

For the student to gain an operational understanding of arrivals, instrument approaches, and instrument approach charts.

Content:

- Review objective of Stage 4

Arrivals

- Standard Terminal Arrival Routes (STARs)

Vertical navigation

The instrument approach

- The segments of an instrument approach

Instrument approach charts

- The elements of an instrument approach chart
- Identification of an instrument approach chart
- Radio communications frequencies
- Plan view of the instrument approach
- Profile view
- The minimum safe altitude circle (MSA)
- Approach minimums
- Timing to the missed approach point
- Typical instrument approach charts
- General comments on instrument approaches
- Visual reference at the DH or MDA
- Visual illusions on approach

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 29

Flight Training

Objective:

For the student to become proficient in performing VOR approaches—full, radar vectors, straight-in, circle-to-land—and missed approach techniques.

Content:

- Instrument Preflight
- File an IFR flight plan
- Full VOR approach, followed by missed approach procedures
- Radar vectors VOR approach, using straight-in minimums
- Partial panel VOR radar vectors approach, using circle-to-land minimums
- Postflight procedures

Completion Standards:

This module is complete when the student can perform VOR approaches (full, radar vectors, straight-in, and circle-to-land) within 100 feet of altitude, and 3 dots of the CDI needle. The student must comply with all ATC clearances and perform all procedures according to the approach plates.

Recommended Reading:

Instrument Flying

This lesson may be completed using ATD Lesson 15.
See Appendix 6.

Stage 4 / **Module 1**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 4 / **Module 2**

Minimum 141 Requirements: Dual, Instrument
1.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to gain an operational understanding of the instrument departure.

Content:

Instrument departures

- Weather at the departure airport
- Takeoff minimums
- Setting course
- Departure Procedures (DPs)
- ATC clearances

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 26

This lesson may be completed using ATD Lesson 16.
See Appendix 6.

Flight Training

Objective:

For the student to become proficient in performing nonprecision approaches, demonstrating full, radar vectors, straight-in, circle-to-land, and missed approach techniques.

Note: Applicants will be required to demonstrate GPS approach proficiency if the aircraft includes a properly installed GPS.

Content:

- Instrument preflight
- File an IFR flight plan
- Nonprecision full approach, followed by missed approach
- Nonprecision radar vector approach, using straight-in minimums
- Nonprecision partial panel, radar vector approach, using circle-to-land minimums
- Postflight procedures

Completion Standards:

This module is complete when the student can perform nonprecision full, radar vectors, missed, circle-to-land, and straight-in approaches while maintaining flight within 100 feet above minimum descent altitude, not descending lower until a decision to land has been made. The student must maintain the flight within ±10° of the runway at the missed approach point.

Recommended Reading:

Instrument Flying

Stage 4 / **Module 2**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 4 / **Module 3**

Minimum 141 Requirements: Dual, Instrument
1.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to gain an understanding of visual maneuvering, including circling to land, contact approaches, visual approaches, visual illusions, wake turbulence on approach, and hydroplaning.

Content:

Visual maneuvering

- Circling to land
  - the visual circling maneuver
  - the visual maneuvering (circling) area
  - sectorized visual maneuvering (circling) areas
  - the missed approach procedure when circling
  - approaches with circling minimums only
  - airports without a published IAP
- Contact approach
- Visual approach
- Visual illusions
- Wake turbulence on approach
- Hydroplaning

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 30

Flight Training

Objective:

For the student to become proficient in performing precision approaches, including missed approach, full and radar vector techniques.

Content:

- Instrument preflight
- Discuss initiating the missed approach before reaching the missed approach point
- File an IFR flight plan
- Precision full approach, followed by missed approach
- Precision radar vector approach, using straight-in minimums
- Localizer radar vector approach, using circle-to-land minimums
- Localizer back course full approach, using straight-in minimums
- Postflight procedures

Completion Standards:

This module is complete when the student can perform precision full and radar vector approaches, and Localizer approaches without descending below the minimum altitudes, and while maintaining airspeed within 10 knots of approach speed, and arriving at the MDA prior to the MAP and performing a prompt missed approach at the accurate time. Precision approach must maintain glideslope within less than full needle deflection.

Recommended Reading:

Instrument Flying

This lesson may be completed using ATD Lesson 17.
See Appendix 6.

Stage 4 / **Module 3**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 4 / **Module 4**

Minimum 141 Requirements: Dual, Instrument
1.5 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to gain an understanding of IFR meteorology, specifically clouds and thunderstorms.

Content:

Clouds

- The naming of clouds
- Moisture in the atmosphere
- The formation of clouds
- Precipitation from clouds
- Lifted index

Thunderstorms

- The life cycle of a thunderstorm
- Downbursts and microbursts
- Tornadoes and water spouts
- Thunderstorms are hazardous to aviation
- Weather radar
- Stormscopes

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapters 19 and 21

Flight Training

Objective:

For the student to demonstrate a proficient nonprecision hold and approach, and precision approach. Student will gain an understanding of IFR lost communication procedures.

Content:

- Instrument preflight
- File an IFR flight plan
- VOR hold
- VOR approach
- Nonprecision approach
- Precision approach
- IFR lost communication procedures
- Postflight procedures

Instructor should request holding entries and full/radar vectors based on areas the student is least proficient.

Completion Standards:

This module is complete when the student can perform the flight with little assistance from the instructor, and maintain flight within 10 knots airspeed, 100 feet altitude, without descending below any minimum altitudes. Student will demonstrate IFR lost communication procedures.

Recommended Reading:

Instrument Flying

Stage 4 / **Module 4**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 4 / **Module 5 and Stage Check**

Minimum 141 Requirements: Dual, Instrument
1.5 hours flight
Stage check
1.5 hours ground instruction
Stage exam

Ground Training

Objective:

For the student to gain an understanding of IFR meteorology, specifically high-level meteorology.

Content:

High-level meteorology

- Jet streams
- Clouds at high levels

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading. Stage 4 Exam must be passed with a minimum score of 80% and reconciled to 100%.

Assignment:

Instrument Flying, Chapter 22

Flight Training

Objective:

For the student to review nonprecision and precision approaches, using missed, circling, straight-in, full/radar vectors, partial panel, and lost communication techniques. For the Stage Check, student should demonstrate skill in the following areas according to the completion standards.

Content:

- Instrument preflight
- File an IFR flight plan
- Nonprecision approach
- Precision approach
- Localizer approach
- IFR lost communication procedures
- Postflight procedures

Instructor should request missed, circling, straight-in, partial panel, and full/radar vectors based on areas the student is least proficient.

Completion Standards:

This module is complete when the student can conduct the flight using efficient cockpit management skills in instrument conditions, and demonstrate nonprecision and precision approaches under the conditions stated by the instructor without busting the minimums set out by each approach. Flight must be maintained at altitude within 100 feet, heading within 10 degrees, and airspeed within 10 knots.

Recommended Reading:

Instrument Flying

Instrument Test Prep, Chapters 6 and 7

Stage 4 / **Module 5**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage Exam Score: _____

Stage Check Successful: _____

Aircraft _____ **ATD** _____ **Other** _____

Optional **Stage 4 Review**

Lesson Time: Dual, Instrument
1.5 hours flight, or whatever is necessary to meet objective
1.5 hour ground instruction, or whatever is necessary to meet objective

Flight Training

Objective:

For the student to review all Stage 4 tasks and meet all objectives.

Content:

- Instrument preflight
- File an IFR flight plan
- Nonprecision approach
- Precision approach
- IFR lost communication procedures
- Postflight procedures

Instructor should request missed, circling, straight-in, partial panel, and full/radar vectors based on areas the student is least proficient.

Completion Standards:

This module is complete when the student can conduct the flight using efficient cockpit management skills in instrument conditions, and demonstrate nonprecision and precision approaches under the conditions stated by the instructor without busting the minimums set out by each approach. Flight must be maintained at altitude within 100 feet, heading within 10 degrees, and airspeed within 10 knots.

Recommended Reading:

Instrument Flying

Optional **Stage 4 Review**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 5
En Route & Prep for Checkride

Objective

The objective of Stage 5 is for the student to become proficient in and have an understanding of the following:

Ground Training

- Enroute procedures
- Wind, air masses, and fronts
- Weather reports and forecasts
- Review Instrument Airman Certification Standards
- Oral prep for the checkride
- Take and pass the FAA Knowledge Exam

Flight Training

- Enroute procedures
- Weather information
- Cross-country flight planning
- Instrument cross-country
- Emergency procedures
- Review of Instrument Airman Certification Standards
- Sign-off for the Instrument Checkride

Completion Standards

Stage 5 is complete when the student achieves the objective of each lesson and can list or describe the correct process or reference for accomplishing elements, exercises, and activities. Student shall score at least 80% on the Stage 5 Exam, and all deficient areas shall be reconciled to 100%. Upon completion of this stage, student will take the Instrument Rating checkride.

Stage 5 / **Module 1**

Minimum 141 Requirements: Dual, Instrument
Cross-country
2.0 hours flight
1.5 hours ground instruction

Ground Training

Objective:

For the student to gain an understanding of enroute procedures on an IFR flight.

Content:

- Review objective of Stage 5

En route

- Radar service
- Enroute clearances
- Position reports
- Additional compulsory radio reports
- Flying the airways
- High altitude flying and oxygen
- VFR-on-top
- DME failure
- Enroute diversions
- Minimum fuel
- Canceling an IFR flight plan

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 27

Flight Training

Objective:

For the student to demonstrate proficiency in planning an IFR cross-country, enroute procedures, and performing a short round-robin that includes a precision and nonprecision approach.

Content:

- Preflight
- Plan IFR round-robin cross-country
- Instrument preflight
- Round-robin IFR cross-country flight
- Simulated loss of communications
- Simulated engine failure
- Simulated instrument failure
- Simulated radio failure
- Nonprecision approach
- Precision approach
- Postflight procedures

Note: One approach should be performed using a partial panel.

Completion Standards:

This module is complete when the student can accurately plan an IFR cross-country flight, demonstrate correct enroute procedures, and perform this flight, including a precision and nonprecision approach, while maintaining flight within ±100 feet altitude, ±10 degrees of heading, ±10 knots airspeed, and approaches within specified minimums.

Recommended Reading:

Instrument Flying

Stage 5 / **Module 1**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 5 / **Module 2**

Minimum 141 Requirements: Dual, Instrument
Cross-country
2.0 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to gain an understanding of IFR meteorology, specifically wind, air masses, and fronts.

Content:

- The nature of the atmosphere
- The cause of weather

Winds

- Windshear
- Windshear avoidance

Air masses and frontal weather

- The warm front
- The cold front
- The occluded front

Depressions—areas of low pressure

- Weather associated with a depression
- Troughs of low pressure
- The wave or frontal depression
- The hurricane or tropical revolving storm

Anticyclones—areas of high pressure

- Weather associated with a high
- A ridge of high pressure
- A col

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 17

Flight Training

Objective:

For the student to demonstrate proficiency in all IFR cross-country procedures while performing a short round robin, including holds, approaches, and partial panel work.

Content:

- Plan IFR cross-country
- Instrument preflight
- Round-robin cross-country flight
- Simulated loss of communications
- Simulated engine failure
- Simulated instrument failure
- Simulated radio failure
- VOR hold
- Nonprecision approach
- Precision approach
- Partial panel work
- Postflight procedures

Completion Standards:

This module is complete when the student can perform IFR cross-country procedures using good cockpit management skills, can maintain flight within ±100 feet, ±10 knots, and ±10 degrees, and can perform approaches within specified minimums.

Recommended Reading:

Instrument Flying

Stage 5 / **Module 2**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 5 / **Module 3**

Minimum 141 Requirements: Dual, Instrument
Cross-country
3.5 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to gain an understanding of IFR meteorology, specifically weather reports and forecasts.

Content:

Obtaining a weather briefing

Weather reports

- Surface analysis charts
- METARs
- Pilot weather reports (PIREPs)

Weather forecasts

- Low-level significant weather prognostic charts
- Graphic area forecasts
- Terminal forecasts (TAF)
- The convective outlook (AC)
- Winds and temperature aloft forecasts (FB)
- Severe weather outlook charts (AC)
- Constant pressure analysis charts
- Tropopause data charts
- Other weather information
- Staying informed in the air

Completion Standards:

This lesson is complete when the student has successfully completed all review questions following the assigned reading.

Assignment:

Instrument Flying, Chapter 23
www.aviationweather.gov

Flight Training

Objective:

For the student to perform the required 250 NM IFR cross-country, demonstrating correct enroute procedures, emergency procedures, and instrument approaches.

Content:

- IFR cross-country planning
- Instrument preflight
- 250 NM cross-country
- Simulated loss of communications
- Simulated engine failure
- Simulated instrument failure
- Simulated radio failure
- Partial panel work
- Precision and non-precision approach—at different airports
- Postflight procedures

Completion Standards:

This module is complete when the student can conduct the 250 NM IFR cross-country procedures efficiently, in an organized manner, with good communications, while maintaining flight within ±100 feet, ±10 degrees, and ±10 knots and all approaches within specified minimums.

Recommended Reading:

Instrument Flying

Stage 5 / **Module 3**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 5 / **Module 4**

Minimum 141 Requirements: Dual, Instrument
1.5 hours flight
1.0 hours ground instruction

Ground Training

Objective:

For the student to have a complete understanding of all areas included in the Instrument Airman Certification Standards.

Content:

- Review the Instrument Airman Certification Standards

Assignment:

Review the Instrument Airman Certification Standards

Flight Training

Objective:

For the student to practice all instrument procedures in preparation for the checkride.

Content:

- Instrument preflight
- Departure procedures
- Navigation to airway
- Perform 2 holds, 1 partial panel
- Emergency procedures
- Nonprecision full approach
- Precision radar vectors approach
- Postflight procedures

Note: Approaches should include straight-in, circle-to-land, and partial panel techniques.

Completion Standards:

This module is complete when the student can perform all instrument procedures within Airman Certification Standards and within specified minimums.

Recommended Reading:

Instrument Flying

Instrument Test Prep, Chapters 1 and 2

This lesson may be completed using ATD Lesson 18.
See Appendix 6.

Stage 5 / **Module 4**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____

Stage 5 / **Module 5 and Stage Check**

Minimum 141 Requirements: Dual, Instrument
1.5 hours flight
Stage check
1.5 hours ground instruction
Stage exam

Ground Training

Objective:

For the student to gain complete understanding of all areas covered in the oral portion of the Instrument checkride.

Content:

- Review all subject matter required for the Instrument rating
- Suggested review material: *Instrument Oral Exam Guide*

Completion Standards:

This lesson is complete when the student passes the Stage 5 Exam with at least an 80%, reconciled to 100%. Student should receive endorsement for FAA instrument written exam.

Assignment:

Suggested reading: Review *Instrument Oral Exam Guide*
Stage 5 Exam
FAA Instrument Rating Knowledge Exam

Flight Training

Objective:

For the student to review all instrument procedures in preparation for the checkride. For the Stage Check, student should demonstrate skill in the following areas according to the completion standards.

Content:

- Instrument preflight
- Instrument cockpit check
- File an IFR flight plan
- Compliance with departure, en route, and arrival procedures and clearances
- Departure procedures
- Navigate to airway
- Intercept and track VOR radial
- Intercept and track NDB bearing
- Perform 2 holds, 1 partial panel
- Simulated loss of communications
- Simulated engine failure
- Simulated instrument failure
- Simulated radio failure
- Recover from unusual attitudes
- Steep Turns
- Slow Flight
- Nonprecision approach
- Precision approach
- Postflight procedures

Note: Approaches must demonstrate straight-in, circle-to-land, missed approach, partial panel, full and radar vector procedures.

Completion Standards:

This module is complete when the student can demonstrate all instrument maneuvers within practical test standards and approach minimums and conduct the flight unassisted by the flight instructor. Student should receive endorsement for instrument checkride.

Recommended Reading:

Instrument Flying

Stage 5 / **Module 5**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage Exam Score: _____

FAA Knowledge Exam Score: _____

Stage Check Successful: _____

Aircraft _____ **ATD** _____ **Other** _____

Optional **Stage 5 Review**

Lesson Time: Dual, Instrument
1.5 hours flight, or whatever is necessary to meet objective
1.5 hours ground instruction, or whatever is necessary to meet objective

Flight Training

Objective:

For the student to review all Stage 5 tasks and meet all objectives.

Content:

- Instrument preflight
- Instrument cockpit check
- File an IFR flight plan
- Compliance with departure, en route, and arrival procedures and clearances
- Departure procedures
- Navigate to airway
- Intercept and track VOR radial
- Intercept and track NDB bearing
- Perform 2 holds, 1 partial panel
- Simulated loss of communications
- Simulated engine failure
- Simulated instrument failure
- Simulated radio failure
- Recovery from unusual attitudes
- Steep Turns
- Slow Flight
- Nonprecision approach
- Precision approach
- Postflight procedures

Note: Approaches must demonstrate straight-in, circle-to-land, missed approach, partial panel, full and radar vector procedures.

Completion Standards:

This module is complete when the student can demonstrate all instrument maneuvers within practical test standards and conduct the flight unassisted by the flight instructor.

Recommended Reading:

Instrument Flying

Optional **Stage 5 Review**

Date of Completion: _____

Signature: _____

Time Flown: _____

Aircraft _____ **ATD** _____ **Other** _____