The Pilot’s Manual

Instrument Rating Syllabus

Seventh Edition


Includes guide to using an ATD as a loggable training device
The Pilot’s Manual

Instrument Rating Syllabus

Seventh Edition


by Jackie Spanitz

Includes guide to using an ATD as a loggable training device
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
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 Part 141 (40 hours for Part 61 programs, 15 hours of which must be with an instrument instructor)
• 50 hours cross-country PIC (Part 61 programs)
• 30 hours of ground training (no minimum time is specified for Part 61 programs)

Instrument Rating Course
The instrument rating is made up of two requirements: aeronautical skill and aeronautical knowledge. This syllabus is written to satisfy 14 CFR Part 141 requirements. This syllabus will be equally effective for 14 CFR Part 61 programs with the addition of 5 hours of instrument flight training and 50 hours cross-country PIC experience.

This 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 ground and flight 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 lesson.

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 met. 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 Part 141 operations includes meeting 35 hours of instruction experience (40 hours for Part 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 total completed 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 an 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 Part 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 FAA has formally recognized the potential of computer-based training devices for use in general aviation instrument flight training curricula. A qualified ATD is highly beneficial when used under the guidance of an authorized instructor to obtaining 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 moving it to 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**

- *The Pilot’s Manual: Ground School* (#ASA-PM-2)
- 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), Instrument Rating Prepware software (#ASA-TW-I), or Instrument Pilot Virtual Test Prep DVD ground school (#ASA-VTP-I)
- ASA Flight Computer (#ASA-E6B or #ASA-CX-3)
- ASA Instrument Plotter (#ASA-CP-IFR)
- ASA Flight Planner for cross-country flights (#ASA-FP)
- 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 Chart for local area
- Chart Supplements (previously Airport/Facility Directory)

This 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 textbook 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 425-235-1500. 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 emailing cfi@asa2fly.com, or you can fax your request on letterhead to 1-425-235-0128.

**FAA Safety Team WINGS Pilot Proficiency Program**

The WINGS Program is based on the premise that pilots who maintain currency and proficiency in the basics of flight will enjoy a safer and more stress-free flying experience. As part of this course, it is recommended that students sign up for a WINGS account at FAASafety.gov to gain access to additional free resources that will supplement ongoing training and proficiency.
**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 ground training and flight time compliance with Part 141. To follow a Part 61 curriculum, add 5 hours of instrument training, for a total of 40 hours. Part 61 instrument rating applicants are also required 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.

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

*Reviews are not necessary to meet Part 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.*
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

<table>
<thead>
<tr>
<th></th>
<th>Covered in Syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Applicable Federal Aviation Regulations for IFR flight operations</td>
</tr>
<tr>
<td>2</td>
<td>Appropriate information in the Aeronautical Information Manual</td>
</tr>
<tr>
<td>3</td>
<td>Air traffic control system and procedures for instrument flight operations</td>
</tr>
<tr>
<td>4</td>
<td>IFR navigation and approaches by use of navigation systems</td>
</tr>
<tr>
<td>5</td>
<td>Use of IFR en route and instrument approach procedure charts</td>
</tr>
<tr>
<td>6</td>
<td>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</td>
</tr>
<tr>
<td>7</td>
<td>Safe and efficient operation of aircraft under instrument flight rules and conditions</td>
</tr>
</tbody>
</table>
| 8 | Recognition of critical weather situations and wind shear 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 1, Module 1  
Stage 3, Module 3 |

### Part 141 Appendix C — Flight Training

<table>
<thead>
<tr>
<th></th>
<th>Covered in Syllabus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>35 hours of instrument training</td>
</tr>
<tr>
<td>2</td>
<td>Dual instruction from an instrument instructor that includes one cross-country flight in airplane single-engine land</td>
</tr>
<tr>
<td>3</td>
<td>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 including an instrument approach at each airport and three different kinds of approaches with the use of navigation systems</td>
</tr>
</tbody>
</table>
**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
- Resource management
- 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

**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
  
**Resource management**
- SRM and CRM

**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)
- Pattern B (see Chapter 9)
- Pattern C (see Chapter 9)
- 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*

---

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

---

**Stage 1 / Module 1**

**Date of Completion:**

**Signature:**

**Time Flown:**

**Aircraft**

**ATD**

**Other**
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
- Three 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
- SRM and CRM

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)
- Pattern E (see Chapter 9)
- Pattern F (see Chapter 9)
- 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.