The Pilot’s Manual
Private Pilot Syllabus

Fourth Edition

A Flight & Ground Training Course for Private Pilot Airplane Certification based on The Pilot’s Manual Ground School

Meets Part 61 and 141 Requirements

ASA-PM-S-P4
The Pilot’s Manual

Private Pilot Syllabus

by Jackie Spanitz

Fourth Edition

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Meets Part 61 and 141 Requirements

Now with an Appendix allowing Basic ATD integration with your existing instructional methods

Aviation Supplies & Academics, Inc.
Newcastle, Washington
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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 a Private Pilot certificate with an Airplane Category rating and a Single-Engine Land class rating.

**Prerequisites:**
The student must be able to read, speak, and understand the English language, meet the physical standards for a third class medical certificate, and possess a valid student pilot certificate. Student must be 16 years old to solo, and 17 years old to gain certification.

**Experience Requirements for a Private Pilot Certificate Include:**
- 35 hours of flight time (40 hours for Part 61 programs)
- 35 hours of ground training (No minimum time is specified for Part 61 programs.)

**Private Pilot Certification Course:**
The Private License is made up of 2 requirements: Aeronautical Skill and Aeronautical Knowledge. This syllabus is written to satisfy 14 CFR Part 141 requirements. With the addition of 5 hours of flight, this syllabus will be equally effective for 14 CFR Part 61 programs. The syllabus is in four Stages, containing Modules. 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. Each flight lesson must include a pre- and post-flight briefing.

**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.*

**Minimum Requirements:**
The time necessary for the syllabus to qualify for 141 operations includes meeting 35 hours of both ground and flight instruction (40 hours flight training for Part 61 programs). This is a *minimum* time — the national average for completion of the private certificate is 73 flight hours. 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). 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.

Instruction in a pilot ground trainer that meets the requirements of Part 141.41(a) may be credited for a maximum of 20% of the total flight training hour requirements. Instruction in a pilot ground trainer that meets the requirements for Part 141.41(b) may be credited for a maximum of 15% of the total flight training hour requirements. When a ground training device is used, the ideal sequence is to learn in the ground training device and practice in the airplane.
Required Materials for the Private Pilot Certification Course:
• The Pilot’s Manual Ground School (#ASA-PM-2A)

Recommended Materials for the Private Pilot Certification Course:
• The Pilot’s Manual Flight School (#ASA-PM-1A)
• FAA Private Practical Test Standards (referred to as PTS) (#ASA-8081-14)
• ASA FAR/AIM (#ASA-FR-AM-BK, updated annually)
• ASA Private Pilot Test Prep (#ASA-TP-P, updated annually)
• ASA logbook (student’s choice)
• ASA flight computer (E6-B or CX-2 Pathfinder)
• ASA plotter (student’s choice)
• ASA flight logs for cross-country flights (#ASA-FP-2)
• ASA Private Oral Exam Guide (#ASA-OEG-P)
• Sectional for local area
• Airport/Facility Directory for local area

The syllabus uses “The Pilot’s Manual” series Ground School textbook for the ground training program. The review following each chapter should be finished with the assigned reading. Flight School, also in “The Pilot’s Manual” series, is recommended for use in enhancing the flight training program. Both books contain an index that will help pinpoint the material for the subject you are working on. ASA’s Private Pilot Test Prep is also recommended to enhance the program. Use of the test 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 Practical Test Standards are upheld and that Airplane Flying Handbook (FAA-H-8083-3A) procedures are maintained at all times.

If you have any questions on how to best use this syllabus, please call ASA directly 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 fax your request on letterhead to 1-425-235-0128.

Photocopy this page, fill out coupon, and mail or fax to ASA.
## Private Pilot Minimum Course Hours

For Part 141, Appendix B Compliance

These course hours are for student/instructor guidance only. They are a suggested time schedule which will ensure minimum flight and ground training compliance with 14 CFR Part 141.

**Note:** Ground Instruction should include classroom discussion, and pre- and post-flight briefings.

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*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.

†14 CFR Part 141 requires 20 hours of dual flight, 5 hours of solo flight, and a total of 35 hours of flight time for the Private Pilot Certificate. Those flights tagged with an asterisk (*) indicate the flights which may be conducted either dual or solo, at the instructor’s discretion.
Enrollment Certificate

This is to certify that

__________________________
Student Name

is enrolled in the Federal Aviation Administration approved
Private Pilot Certification 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 Private Pilot
Certification Course conducted by

__________________________
School and Certificate Number

__________________________
Chief Instructor

__________________________
Date of Graduation
Stage 1
Introduction to Flying

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
• Forces acting on an airplane
• Stability and control
• Training airplane (airframe, engine, systems, flight instruments)
• Basic flight maneuvers
• Flight information
• Flight physiology
• Regulations

Flight Training
• Flight training process
• Training airplane
• Preflight
• “Special Emphasis Areas” (per PTS)
• Taxiing
• Four basics of flight (straight and level, turns, climbs, descents)
• Use of sectional
• Collision avoidance
• Slow Flight
• Stall series
• Steep Turns
• Instrument scan

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%. Student shall have third-class medical and student pilot certificate upon completion of this stage.
Stage 1 / Module 1

Ground Training

Objective:
For the student to be introduced to the Private Pilot Certification program, and learn the flight school requirements, procedures, regulations, and grading criteria. Student shall also become familiar with stability, control, and the forces acting on an airplane.

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

The forces acting on an airplane
- Weight
- Lift
  - streamline/turbulent flow
  - Bernoulli’s Principle
  - dynamic/static pressure
  - airspeed
  - airfoil shape
  - aerodynamic force
  - pressure distribution and CP movement
- Drag
  - total drag
  - parasite drag
  - skin-friction drag
  - form drag
  - interference drag
  - induced drag
  - angle-of-attack
  - wing design
  - lift/drag ratio
  - wing flaps
  - leading-edge devices
  - spoilers
- Thrust
  - propeller motion
  - forces on a propeller blade
  - propeller efficiency
  - controllable-pitch propellers
  - takeoff effects of propellers
  - propeller torque effect
  - gyroscopic effect
  - P-factor

Stability and control
- Stability
  - static/dynamic stability
  - stability vs. maneuverability
  - airplane equilibrium
  - pitching moments
  - longitudinal/directional/lateral stability
- Control
  - elevator
  - ailerons
  - rudder
  - control effectiveness

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

Assignment:
Ground School, Chapters 1 and 2

Flight Training

Objective:
For the student to be introduced to and become familiarized with preflight inspections, checklist operations, starting and taxi procedures, and the function and use of the airplane controls.

Content:
- Preflight inspection and aircraft documents (certificates and documents, aircraft logbooks, airplane servicing)
- Special Emphasis Area discussion (from PTS): positive aircraft control, positive exchange of flight controls, stall/spin awareness, collision avoidance, wake turbulence avoidance, LAHSO, runway incursion avoidance, controlled flight into terrain, aeronautical decision making, checklist usage
- Starting procedures
- Taxi
- Control effects on ground and in flight
- Checklist introduction and use
- Normal takeoff
- Four Basics: straight and level, climbs, descents, turns
- Collision avoidance procedures
- Normal approach and landing
- Postflight procedures

Completion Standards:
This lesson is complete when the student can conduct the preflight with minimum assistance, properly use all checklists, start the airplane, taxi, and operate the controls.

Recommended Reading:
Flight School

Minimum 141 Requirements:
Dual
- 1.0 hour flight
- 2.0 hours ground instruction

Date of Completion: ____________________________
Signature: ____________________________________
Time Flown: ________________________________
Stage 1 / Module 2

Ground Training

Objective:
For the student to have an understanding of the airplane’s airframe, engine, and system.

Content:

Airframe
- Fuselage
- Wings
- Empennage
- Flight controls
- Landing gear
- Engine and propeller

Engine
- Description and principles
- Four-stroke engine cycle
- Ignition
- Starter
- Exhaust system
- Carburetor
- Accelerator pump
- Idling system
- Fuel/air mixture control
- Abnormal combustion
  - Detonation
  - Preignition
- Carburetor ice
- Impact ice
- Fuel ice
- Throttle ice
- Carburetor heat
- Fuel injection systems

Systems
- Fuel system
- Oil system
- Cooling system
- Electrical system
- Vacuum system

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

Assignment:
Ground School, Chapters 4, 5, and 6

Flight Training

Objective:
For the student to become proficient with the four basics of flight: straight and level, climbs, turns, and descents; and collision avoidance procedures.

Content:
- Preflight
- Radio communications
- Normal takeoff and climbout
- Collision avoidance procedures
- Climbs
- Straight and level
- Turns: 90, 180, 360 degrees, and turns to headings
- Descents: with and without power and flaps
- Scanning procedures
- Normal approach and landing
- Postflight procedures

Completion Standards:
This lesson is complete when the student has an understanding of the four basics of flight, 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:
Flight School

Minimum 141 Requirements:
Dual
1.0 hour flight,
0.3 instrument work
2.0 hours ground instruction
Ground Training

Objective:
For the student to understand how to properly operate the engine, and have an understanding of the flight instruments.

Content:

- Engine operation
  - Starting the engine
  - Stopping the engine
  - Changing power setting with a constant-speed propeller
  - Engine handling
  - Rough running
  - Cross-checking engine instruments
  - Taxiing
  - Engine failure in flight
  - Engine fire in flight
  - Engine fire on startup

Flight instruments

- Pressure Instruments
  - static pressure
  - dynamic pressure
  - total pressure
  - pitot-static system
  - airspeed indicator
  - altimeter
  - vertical speed indicator

- Gyroscopic Instruments
  - turn coordinator/turn indicator
  - attitude indicator
  - heading indicator

- Magnetic compass

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

Assignment:
*Ground School, Chapters 6 and 7*

Flight Training

Objective:
For the student to become proficient in postflight and trimming procedures. The student will also be introduced to Slow Flight and become oriented with the practice area.

Content:

- Preflight
- Use of sectional
- Radio communications
- Normal takeoff and departure
- Review of four basics
- Trimming
- Outline of practice area and reference to airport
- Slow Flight
- Collision avoidance
- Normal approach and landing
- Postflight procedures

Completion Standards:
This lesson is complete when the student can maintain flight within 200 feet altitude, 20 degrees heading, and 20 knots airspeed, while performing the maneuvers listed in the content of this module. Also the student must be proficient in the art of trimming, postflight operations, be oriented to the practice area and airport, and be familiarized with Slow Flight.

Recommended Reading:
*Flight School*

Minimum 11 Requirements:
- Dual
  - 1.0 hour flight
  - 1.5 hours ground instruction

Stage 1 / Module 3

Date of Completion: ________________________

Signature: ________________________

Time Flown: ________________________
Ground Training

Objective:
For the student to gain knowledge of the basic flight maneuvers required for the private pilot certificate, and the tools available for obtaining flight information.

Content:

Basic flight maneuvers
- Straight-and-level
- Climbing and descending
- Climb
- Descent
- Turning and load factor
- Forces in a turn
- thrust in a turn
- steep turns
- stalling in a turn
- Stalling
- awareness of the stall
- recovery from the stall
- factors affecting stall speed
- stall warning devices
- wing design and the stall
- Spinning
- spin entry
- spins
- spin recovery

Flight information
- NOTAMs
- Airport/Facility Directory
- Aeronautical Information Manual
- Federal Aviation Regulations
- Pilot/Controller Glossary
- Advisory Circulars

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

Assignment:
Ground School, Chapter 3

Flight Training

Objective:
For the student to become proficient in the use of sectionals, and to be introduced to Power-on Stalls, Power-off Stalls, and Steep Turns.

Content:
- Preflight
- Radio communications
- Normal takeoff and landing
- Use of sectional
- Collision avoidance procedures
- Four basics
- Steep Turns
- Slow Flight
- Power-on Stalls
- Power-off Stalls
- Normal approach and landing
- Postflight procedures

Completion Standards:
This module is complete when the student can maintain flight within 200 feet altitude, 20 degrees heading, 20 knots airspeed, while performing the maneuvers listed in the content of this module. The student must also be able to orient himself/herself with use of the sectional, and be introduced to Power-on and Power-off Stalls, and Steep Turns.

Recommended Reading:
Flight School

Minimum 141 Requirements:
Dual
1.0 hour flight,
0.3 instrument work
1.5 hours ground instruction

Stage 1 / Module 4

Date of Completion: __________________________
Signature: __________________________________
Time Flown: _________________________________
Stage 1 / **Module 5 and Stage Check**

**Ground Training**

**Objective:**
For the student to understand the factors which affect the physiology of flight, and to become familiar with the regulations which govern the student and private pilot, and general aviation flight.

**Content:**
*Flight physiology*
- Am I Fit to Fly?
  - physical fitness
  - mental fitness
  - medical checks
  - medication
  - upper respiratory tract problems
  - corrective lenses
  - food poisoning
  - alcohol
  - smoking
  - fatigue and sleep deprivation
  - blood donation
- Low Temperatures
- Respiration
  - increased altitude
  - hypoxia
  - carbon monoxide poisoning
  - hyperventilation
  - decompression sickness
- Balance
  - sensing acceleration
  - inner ear balance mechanism
  - motion sickness
  - vertigo
  - spatial disorientation
  - sensory illusions
- Vision
  - structure of the eye
  - adaptation of eyes to darkness
  - scanning for aircraft
  - visual illusions on approach
- Discuss and obtain medical and student pilot certificate
- 14 CFR Part 1
- 14 CFR Part 61
- 14 CFR Part 91
- NTSB 830

**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:**
*Ground School*, Chapters 12 and 19
Stage 1 Exam

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**Flight Training**

**Objective:**
For the student to be introduced to the instrument scan, and gain proficiency in Steep Turns, Slow Flight, and stalls. Student should have third-class medical at the completion of this stage. For the Stage Check, student should demonstrate skill in the following areas according to the completion standards.

**Content:**
- Verify medical and student pilot certificate
- Preflight
- Radio communications
- Normal takeoff and departure
- Four basics
- Steep Turns
- Slow Flight
- Power on/off Stalls
- Spin awareness
- Use of instrument scan
- Collision avoidance
- Use of sectional
- Normal approach and landing
- Postflight procedures

**Completion Standards:**
The student should be able to maintain flight within 150 feet altitude, 15 degrees of heading, and 15 knots of airspeed, while performing the maneuvers listed in the content of this module. The student should be capable of demonstrating preflight, use of checklists, taxiing, the four basics, trimming, Slow Flight, Power on/off Stalls, Steep Turns, scanning, collision avoidance, and use of sectional with minimum assistance by the flight instructor.

**Recommended Reading:**
*Flight School*
*Private Pilot Test Prep*, Chapters 1, 2, and 3

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**Minimum 141 Requirements:**
Dual
1.0 hour flight,
0.3 instrument work
Stage check
1.5 hours ground instruction
Stage exam

---

**Stage 1 / Module 5**

**Date of Completion:**

**Signature:**

**Time Flown:**

**Stage Exam Score:**

**Stage Check Successful:**

---

Aviation Supplies & Academics, Inc.
Optional **Stage 1 Review**

**Lesson Time:** Dual 1.0 hour 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 1 tasks and meet all objectives.

**Content:**
- Preflight
- Taxi
- Checklist use
- Radio communications
- Normal takeoff and departure
- Four basics
- Steep Turns
- Slow Flight
- Power on/off Stalls
- Use of instrument scan
- Collision avoidance
- Use of sectional
- Normal approach and landing
- Postflight procedures

**Completion Standards:**
The student should be able to maintain flight within 150 feet altitude, 15 degrees of heading, and 15 knots of airspeed, while performing the maneuvers listed in the content of this module. The student should have a practical understanding of preflight, checklists, taxiing, the four basics, trimming, Slow Flight, Power on/off Stalls, Steep Turns, scanning, collision avoidance, and use of sectional.

**Recommended Reading:**
*Flight School*

---

Optional **Stage 1 Review**

**Date of Completion:**

**Signature:**

**Time Flown:**
Stage 2
Solo

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

Ground Training
- Airplane performance factors
- Operational weather concerns
- Obtaining a weather briefing
- Making the go-no go decision
- Charts and airspace
- Airports and airport operations
- Visual navigation fundamentals
- Using the flight computer
- Weight and balance

Flight Training
- Pre-solo maneuvers (per 14 CFR § 61.87)
- Traffic pattern operations
- Emergency situations
- Normal and crosswind takeoffs and landings
- Solo flight

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 Pre-Solo Written Exam, and all deficient areas shall be reconciled to 100%.
Ground Training

Objective:
For the student to have an understanding of the factors which affect airplane performance, and a working knowledge of ground reference maneuvers.

Content:
_____ Review objective of Stage 2
Airplane performance factors
_____ Airworthiness
- registration certificate
- airworthiness certificate
- approved flight manual
- maintenance
_____ Airframe Limitations
- weight limitations
- speed limitations
- flying in turbulence
- load factor limitations
- velocity/load factor or V-G diagram
_____ Air Density
- factors affecting air density
- standard atmosphere
- pressure altitude
- temperature
- density altitude
- indicated airspeed and performance
_____ Wind Drift

Ground Reference Maneuvers
_____ Site selection
_____ Wind direction and speed
_____ Entry track
_____ Altitude
_____ Aircraft speed
_____ Emergency operations

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

Assignment:
Ground School, Chapter 8

Flight Training

Objective:
For the student to be introduced to cockpit management, ATC light signals, Rectangular Course, and to become proficient with radio communications.

Content:
_____ Preflight
_____ Discussion of cockpit management and ATC light signals
_____ Radio work
_____ Normal takeoff and departure
_____ Review of four basics (pitch + power = performance)
_____ Steep Turns
_____ Slow Flight
_____ Power on/off Stalls
_____ Rectangular Course
_____ Normal approach and landing
_____ 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. The student must also be capable of maintaining the radio, and be knowledgeable in ATC light signals and cockpit management.

Recommended Reading:
Flight School

Minimum 141 Requirements:
Dual
1.0 hour flight,
0.3 instrument work
2.0 hours ground instruction
Ground Training

Objective:
For the student to have an understanding of the operational weather factors, and a practical understanding of obtaining a weather briefing, and making the go-no go decision.

Content:
Operational weather factors
___ Icing
    ___ Structural icing
    ___ Clear ice
    ___ Rime ice
    ___ Mixed ice
    ___ Frost
    ___ Structural icing and cloud type
    ___ Induction icing
        ___ carburetor icing
        ___ engine intake icing
        ___ Instrument icing
    ___ Cold weather operations
___ Visibility
    ___ Particles in the air
    ___ Inversions and reduced visibility
    ___ Condensation
    ___ Fog
        ___ radiation fog
        ___ advection fog
        ___ upslope fog
        ___ frontal fog
        ___ steam fog
    ___ Turbulence
        ___ Clear air turbulence
        ___ Classification of turbulence
    ___ Windshear
    ___ Thunderstorms
    ___ Microbursts
    ___ Obtaining a weather briefing
    ___ Making the go-no go decision

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

Assignment:
Ground School, Chapter 17 and Chapter 18: “Obtaining a Weather Briefing” (only)

Flight Training

Objective:
For the student to become proficient with traffic pattern operations, and be introduced to S-turns, Turns Around a Point, and wake turbulence avoidance.

Content:
Preflight
___ Obtain weather
___ Go-no go decision
___ Wake turbulence avoidance
___ Normal/crosswind takeoff and departure
___ Slow Flight
___ Power on/off Stalls
___ Steep Turns
___ Rectangular Course
___ S-turns
___ Turns Around a Point
___ Pattern work
___ Normal/crosswind approach and landing
___ Postflight procedures

Completion Standards:
This module is complete when the student can maintain flight within 150 feet, 15 degrees, 15 knots, while performing the maneuvers listed in the content of this module. Student must also be able to enter and depart a normal traffic pattern, perform wake turbulence avoidance, S-turns, and Turns Around a Point.

Recommended Reading:
Flight School

Minimum 141 Requirements:
Dual
1.0 hour flight
2.0 hours ground instruction
Ground Training

Objective:
For the student to have an understanding of aviation charts and the airspace system, and a practical understanding of no-flap landings, slips, aborted takeoffs, and rejected landings (go-arounds).

Content:
Charts
  ___ Sectional charts
  ___ VFR Terminal Area charts
Airspace
  ___ Class A
  ___ Class B
  ___ Class C
  ___ Class D
  ___ Class E
  ___ Class G
  ___ Special use airspace
  ___ Other airspace
Special Takeoffs and Landings
  ___ No-flap landing
  ___ Slips
  ___ Aborted takeoff
  ___ Rejected landing (go-around)

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

Assignment:
Ground School, Chapters 20 and 21

Flight Training

Objective:
For the student to become proficient with normal and crosswind takeoffs and landings, and be introduced to go-around and aborted takeoff procedures, and no flap or slips to landings.

Content:
  ___ Preflight
  ___ Obtain weather, go-no go decision
Pattern work
  ___ Normal and crosswind takeoffs
  ___ Normal and crosswind landings
  ___ Emergency approaches
  ___ No flap landing
  ___ Aborted takeoff (warn tower before starting)
  ___ Slips to landing
  ___ Go-around procedures
  ___ Postflight procedures

Completion Standards:
This module is complete when the student can operate proficiently in traffic patterns and can takeoff and land being the sole manipulator of the controls.

Recommended Reading:
Flight School

Minimum 141 Requirements:
Dual
  1.0 hour flight,
  0.3 instrument work
  1.5 hours ground instruction

Stage 2 / Module 3

Date of Completion: __________________________
Signature: __________________________
Time Flown: __________________________
Ground Training

Objective:
For the student to become familiar with airports and airport operations.

Content:
Airports
- Taxiway and runway markings
- Airport lighting
Airport operations
- ATIS
- Taxiing
- Standard traffic pattern
- Legs of a traffic pattern
- Wind effect in the traffic pattern
- Departing the traffic pattern
- Radio communications
- Entering the traffic pattern
Airport Radar Services
- TRSA radar service
- Basic radar service
- Traffic sequencing for pilots
- Full radar services

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

Assignment:
Ground School, Chapter 22

Minimum 141 Requirements:
Dual
1.0 hour flight
1.5 hours ground instruction

Flight Training

Objective:
For the student to become proficient in emergency situations, including system and equipment malfunctions, forward slips to landing, aborted takeoffs, and go-arounds.

Content:
- Preflight
- Discussion of pre-solo requirements (14 CFR § 61.87)
- Discussion of emergency equipment and survival gear
- Slow Flight
- Takeoff and departure stalls
- Approach to landing stalls
- Rectangular Course
- Turns Around a Point
- S-turns
- Cruise emergency situations (system and equipment malfunction)
- Normal and crosswind takeoffs
- Normal and crosswind landings
- Slip to a landing
- Aborted takeoff (warn tower before starting)
- Go-arounds
- Forced landings from practice area and pattern
- Postflight procedures

Completion Standards:
This module is complete when the student can operate in emergency situations in all phases of flight: cruise, takeoff, and landing. Emergencies include: equipment and system malfunctions, conditions forcing an aborted takeoff, and forced landings. Flight in all phases must be within 100 feet, 10 degrees, 10 knots, and coordination must be maintained at all times.

Recommended Reading:
Flight School

Stage 2 / Module 4

Date of Completion: ____________________________
Signature: ____________________________
Time Flown: ____________________________
Flight Training

Objective:
For the student to gain proficiency in all pre-solo maneuvers. Upon completion of this flight, student will be ready to be signed off for solo operations.

Content:
- Discussion of pre-solo requirements
- Normal/crosswind takeoff and landing
- Pre-solo maneuvers (per 14 CFR § 61.87)
- Emergency situations
- Student is sole manipulator of controls for entire flight

Completion Standards:
This module is complete when the student is comfortable with all of the pre-solo maneuvers and can conduct all with minimum assistance from the flight instructor. Flight must be maintained within 100 feet, 10 degrees, 10 knots, and coordination must be maintained.

Recommended Reading:
Flight School

Assignment:
Stage 2 Pre-Solo Written Exam

Optional Stage 2 Review

Date of Completion:________________________
Signature:________________________
Time Flown:________________________
Stage 2 / Module 5

Ground Training

Objective:
For the student to become proficient in the fundamentals of visual navigation. Student must also have an understanding of the pre-solo requirements, and demonstrate that knowledge through a pre-solo written exam.

Content:
Visual navigation fundamentals

- Pilotage
- Dead reckoning
- Radio navigation
- Course
- Heading
- True airspeed
- Wind velocity/direction
- Ground track/Ground speed
- Drift/Wind correction angle
- Tracking error
- Latitude/Longitude
- Nautical mile
- Knot
- Altitude/Flight level
- VFR cruise altitude
- Minimum safe altitude
- Standard/Local time
- UTC/Zulu time
- Daylight time
- Dateline

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:
Ground School, Chapter 23
Ensure Stage 2 Pre-Solo Written Exam is completed and graded.

Flight Training

Objective:
For the student to be signed off for solo work. The suggestion is to conduct this module in three flights: (A) dual flight, (B) supervised solo, and (C) solo session.

Content:
Flight A (Dual)
- Preflight
- Review of pre-solo maneuvers
- Normal/crosswind takeoff and landing
- Emergency situations
- Student is sole manipulator of controls for entire flight
- Postflight

Flight B (Supervised Solo)
Pattern work
- Instructor endorsement
- Preflight
- 10 takeoffs and landings
- Radio work
- Slips to landing
- Emergency go-arounds
- Postflight

Flight C (Solo)
- Preflight
- Normal/crosswind takeoffs and landings (3)
- Slow Flight
- Power on/off Stalls
- Steep Turns
- Rectangular Course
- S-turns
- Turns Around a Point
- Pilotage/dead reckoning back to airport
- Postflight

Completion Standards:
This module is complete when the student is signed off for solo work, and the student has conducted two solo flights — one flight strictly in the pattern, perfecting takeoffs and landings, and one practicing all the private maneuvers. Flight must be maintained within 100 feet, 10 degrees, 10 knots, and coordination maintained, while performing the maneuvers listed in the content of this module.

Recommended Reading:
Flight School

Minimum 141 Requirements:
Dual 0.5 hour flight
Solo 2.0 hours flight
1.5 hours ground instruction
Stage exam (pre-solo written)

Date of Completion:

Signature:

Time Flown:

Stage Exam Score:
Instructor Note: Follow the formats below when signing-off endorsements for your students. (From AC 61-65E)

1. **Endorsement for pre-solo aeronautical knowledge: 14 CFR §61.87(b)**

   I certify that ___________________ (First name, MI, Last name) has satisfactorily completed the pre-solo knowledge exam of §61.87(b) for the ____________________ (make and model aircraft).

   [date]     J. Jones  654321 CFI   [expiration date]

2. **Endorsement for pre-solo flight training: 14 CFR §61.87(c)**

   I certify that ___________________ (First name, MI, Last name) has received the required pre-solo training in a ____________________ (make and model aircraft). I have determined he/she has demonstrated the proficiency of §61.87(d) and is proficient to make solo flights in ____________________ (make and model aircraft).

   [date]     J. Jones  654321 CFI   [expiration date]

3. **Endorsement for solo (each additional 90-day period): 14 CFR §61.87(p)**

   I certify that ___________________ (First name, MI, Last name) has received the required training to qualify for solo flying. I have determined he/she meets the applicable requirements of §61.87(p) and is proficient to make solo flights in ____________________ (make and model aircraft).

   [date]     J. Jones  654321 CFI   [expiration date]

4. **Endorsement for solo flight in the Class B airspace: 14 CFR §61.95(a)**

   I certify that ___________________ (First name, MI, Last name) has received the training required by §61.95(a). I have determined he/she is proficient to conduct solo flights in ____________________ (name of Class B) airspace. *(List any applicable conditions or limitations.)*

   [date]     J. Jones  654321 CFI   [expiration date]

5. **Endorsement for solo flight to, from, or at an airport located within Class B airspace:**

   **14 CFR §61.95(a) and §91.131(b)(1)**

   I certify that ___________________ (First name, MI, Last name) has received the required training of §61.95(a)(1). I have determined that he/she is proficient to conduct solo flight operations at ____________________ (name of airport). *(List any applicable conditions or limitations.)*

   [date]     J. Jones  654321 CFI   [expiration date]

Reminder: Instructor will need to endorse student pilot certificate.
Stage 2 / Module 6 and Stage Check

Ground Training

Objective:
For the student to have a practical understanding of using the flight computer and calculating weight and balance.

Content:
Using the flight computer
- Calculator side
- Wind side
- Finding TAS
- Finding/Determining heading and groundspeed
- Finding the time en route and fuel requirements
- Speed-Time-Distance problems
- Fuel consumption problems
- Finding wind components
- Conversions

Weight and balance
- Weight
  - empty weight
  - gross weight
- Balance
  - moment of a force
  - finding CG
  - airplane datums
  - effect of CG on airplane handling
- Weight and Balance calculations
  - finding the CG
  - graphical/tabular presentation of weight-and-balance data
  - weight-shift calculations
  - weight-change calculations
  - CG movement
- Review cross-country flight requirements
  (per 14 CFR §61.93)

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

Assignment:
Ground School, Chapters 11 and 24

Flight Training

Objective:
For the student to experience takeoffs at $V_x$ and $V_y$, and to experience short-field takeoffs and landings. The student should also gain knowledge and experience in radio navigation and instrument work. For the Stage Check, student should demonstrate skill in the following areas according to the completion standards.

Content:
- Discussion of radio navigation
- Preflight
- $V_x$ and $V_y$ takeoffs and landings
- Four basics under the hood
- Slow Flight
- Stalls (power on/off)
- Steep Turns
- Ground reference maneuvers
- Radio navigation
- Short-field takeoffs and landings
- Postflight procedures

Completion Standards:
This module is complete when the student can fly takeoffs and landings at $V_x$ and $V_y$, perform short-field takeoffs and landings, navigate with radio facilities (VOR), and perform the four basics in instrument conditions (under the hood). Flight should be within 150 feet, 15 degrees, and 15 knots, while performing the maneuvers listed in the content of this module. Student should demonstrate pre-solo maneuvers without instructor assistance.

Recommended Reading:
Flight School
Private Pilot Test Prep, Chapters 4, 5, and 12

Minimum 141 Requirements:
Dual
1.0 hour flight,
0.3 instrument work
Stage check
2.0 hours ground instruction

Stage 2 / Module 6

Date of Completion:

Signature:

Time Flown:

Stage Check Successful:
**Stage 3**
Cross-Country Flight

**Objective**
The objective of Stage 3 is for the student to gain knowledge and experience in the following:

**Ground Training**
- Takeoff performance
- Landing performance
- Enroute performance
- Flight planning
- Radio navigation: VOR, ADF, radar, transponder, DME, RNAV, VDF
- Enroute navigation

**Flight Training**
- Pre-cross-country maneuvers (per 14 CFR § 61.93)
- Cross-country flight planning
- The required dual and solo cross-country time

**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

Ground Training

Objective:
For the student to have a practical understanding of takeoff, landing, and enroute performance.

Content:
- Review objective of Stage 3
- Takeoff performance
  - Factors affecting takeoff performance
    - weight
    - increased takeoff speed
    - air density
    - head/tail winds
    - crosswinds
    - runway surface/slope
    - flaps
    - Takeoff distance graph/table
- Landing performance
  - Factors affecting landing performance
    - weight
    - air density
    - effect of wind
    - runway surface/slope
    - flaps
    - fast approach speeds
    - Landing distance graph/table
  - Wake Turbulence
  - Ground Effect
  - Windshear
  - Taxiing
- Enroute performance
  - Cruise altitude
  - Power setting
  - Fuel consumption/requirements
  - Effects of wind

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

Assignment:
Ground School, Chapters 9 and 10

Flight Training

Objective:
For the student to become proficient in radio navigation, and to become competent to perform at satellite airports. The student will also gain experience in soft-field techniques, and gain proficiency in instrument work and lost procedures.

Content:
- Flight A (Dual)
  - Preflight
  - Crosswind takeoffs and landings
  - Short-field takeoffs and landings
  - Soft-field takeoffs and landings
  - Pilotage to another airport/Diversion
- Instrument
  - Four basics
  - Constant airspeed climbs
  - Constant airspeed descents
  - Turns to headings
  - Slow Flight
  - Stalls
  - Radio navigation
  - Lost procedures
  - Postflight procedures
- Flight B (Solo)
  - Instructor endorsement
  - Preflight
  - Pilotage and radio navigation to satellite airport
  - Crosswind takeoffs and landings
  - Short-field takeoffs and landings
  - Soft-field takeoffs and landings
  - Postflight

Completion Standards:
This module is complete when the student can perform soft-field techniques, navigate by pilotage, fly to an assigned diversion, and fly at Slow Flight in instrument conditions. Flight should be within 100 feet, 10 degrees, and 10 knots, while performing the maneuvers listed in the content of this module. Landings should be within 200 feet of chosen point of landing.

Recommended Reading:
Flight School

Minimum 141 Requirements:
- Dual 1.0 hour flight, 0.3 instrument work
- Solo 1.0 hour flight
- 1.5 hours ground instruction

Stage 3 / Module 1

Date of Completion: _________________________

Signature: _________________________

Time Flown: _________________________
Instructor Note: Follow the format below when signing-off the endorsement for your students. (From AC 61-65E)

Endorsement for solo landings and takeoffs at another airport within 25 NM: 14 CFR §61.93(b)(1)

I certify that __________________________ (First name, MI, Last name) has received the required training of §61.93(b)(1). I have determined that he/she is proficient to practice solo takeoffs and landings at __________________________ (airport name). The takeoffs and landings at __________________________ (airport name) are subject to the following conditions: __________________________ (List any applicable conditions or limitations.)

[date] J. Jones 654321 CFI [expiration date]
Stage 3 / Module 2

**Ground Training**

**Objective:**
For the student to have a practical understanding of flight planning, and a working knowledge of weather in preparation for solo cross-country flight.

**Content:**
- Flight planning
  - Personal navigation equipment
  - Weather and operational considerations
  - Preflight planning
    - altitude
    - courses and distances
    - speed, time and heading calculations
    - completing the flightlog
    - fuel calculations
    - weight-and-balance
    - takeoff and landing performance
  - The flight plan form
  - Airplane documentation and preparation for flight
- Right-of-way rules
- Weather discussion
  - Clouds
  - Thunderstorms
  - Air masses
  - Frontal weather
  - Low- and high-pressure systems
  - Weather reports
  - Weather forecasts

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

**Assignment:**
*Ground School*, Chapter 25

**Flight Training**

**Objective:**
For the student to gain knowledge and experience in private maneuvers, specialty takeoffs and landings. Student shall become proficient at flying to satellite airports.

**Content:**
- Preflight
- Crosswind takeoffs and landings
- Short-field takeoffs and landings
- Soft-field takeoffs and landings
- Navigation to satellite airport
- Steep Turns
- Slow Flight
- Stalls
- Ground reference maneuvers
- Postflight
- Right-of-way rules
- Weather discussion
  - Clouds
  - Thunderstorms
  - Air masses
  - Frontal weather
  - Low- and high-pressure systems
  - Weather reports
  - Weather forecasts

**Completion Standards:**
This module is complete when the student can fly within 100 feet, 10 degrees, and 10 knots, while performing the maneuvers listed in the content of this module.

**Recommended Reading:**
*Flight School*

**Minimum 141 Requirements:**
- *Solo*
  - 1.0 hour flight
  - 1.5 hours ground instruction
- *Flight can be conducted dual or solo at the instructor’s discretion.*

**Stage 3 / Module 2**

**Date of Completion:** __________________________

**Signature:** __________________________

**Time Flown:** __________________________
Stage 3 / Module 3

Ground Training

Objective:
For the student to have a practical understanding of radio navigation using the VOR.

Content:
Navigation aids
____ VOR
____ VOR/DME, TACAN and VORTAC
____ Course deviation indicator
____ TO/FROM arrow
____ Radio magnetic indicator (RMI)
____ Horizontal situation indicator (HSI)
____ VOR receiver check
____ Orientation
____ Intercepting course
____ Tracking

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

Assignment:
Ground School, Chapter 27

Minimum 141 Requirements: Dual, Cross-Country
2.0 hours flight,
0.3 instrument work
2.0 hours ground instruction

Flight Training

Objective:
For the student to become competent at performing cross-country duties. Student should also gain experience in instrument flight at unusual attitudes.

Content:
Cross-country discussion
____ Plotting course
____ Flightlog
____ Weather
____ Filing flight plan
____ Flight computer
____ Preflight
____ Cross-country flight
____ Use of flightlog
____ Navigation
____ Radio communications
____ Instrument unusual attitudes
____ Short-field takeoffs and landings
____ Soft-field takeoffs and landings
____ Postflight

Completion Standards:
This module is complete when the student is competent to conduct solo cross-country operations. Flight must be within 200 feet, 15 degrees, and 10 knots, and coordination maintained at all times. Cross-country operations must be within 5 minutes of ETA and 3 NM of route.

Recommended Reading:
Flight School

Stage 3 / Module 3

Date of Completion: ___________________________
Signature: ___________________________
Time Flown: ___________________________
Optional **Stage 3 Review**

**Lesson Time:** Dual, Cross-Country
1.5 hours flight, or whatever is necessary to meet objective
1.0 hour ground instruction, or whatever is necessary to meet objective

**Flight Training**

**Objective:**
For the student to become competent at performing cross-country duties. Student should also gain experience in instrument flight at unusual attitudes.

**Content:**
- Cross-country discussion
- Plotting course
- Flightlog
- Weather
- Filing flight plan
- Flight computer
- Preflight
- Cross-country flight
- Flightlog use
- Navigation
- Radio communications
- Instrument unusual attitudes
- Short-field takeoffs and landings
- Soft-field takeoffs and landings
- Postflight

**Completion Standards:**
This module is complete when the student is competent to conduct solo cross-country operations. Flight must be within 200 feet, 15 degrees, and 10 knots, and coordination maintained at all times. Cross-country operations must be within 5 minutes of ETA and 3 NM of route.

**Recommended Reading:**
*Flight School*

**Optional Stage 3 Review**

**Date of Completion:**

**Signature:**

**Time Flown:**
Stage 3 / Module 4

Ground Training

Objective:
For the student to gain a practical understanding of radio navigation including ADF, Radar, the Transponder, DME, RNAV, and VDF.

Content:
Navigation aids
- NDB and ADF
- ADF and heading indicator
- NDB range, accuracy, identification
- ADF control panel
- ADF relative bearing indicator (RBI)
- ADF radio magnetic indicator
- orientation
- intercepting course
- tracking
- Radar
- Transponder
- DME
- RNAV — Area Navigation
- LORAN-C
- GPS
- VHF Direction Finding

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

Assignment:
Ground School, Chapter 27

Flight Training

Objective:
For the student to gain the required experience in solo cross-country operations. Flight must be at least 100 NM, with landings at a minimum of three points.

Content:
- Cross-country planning
- Instructor endorsement
- Preflight
- VOR and/or ADF Navigation
- Pilotage
- Dead Reckoning
- Flightlog kept throughout flight
- At least one landing more than 50 NM from departure airport
- Postflight

Completion Standards:
This module is complete when the student can maintain flight coordinated and within 200 feet, 15 degrees, and 10 knots, at all times. Cross-country should be flown within 3 NM of the planned route at all times, and arrive at the en route checkpoints and destinations within 5 minutes of the initial or revised ETA.

Recommended Reading:
Flight School
Stage 3 / Module 5 and Stage Check

Ground Training

Objective:
For the student to gain an understanding of enroute navigation.

Content:
Enroute navigation
- Compensating for wind effect
- Departure from an airport
- Cruise
- Map-reading in flight
- Chart orientation in the airplane
- Log keeping
- Navigation techniques
- Groundspeed checks
- Heading corrections
- Diversions
- En route diversions
- Diversions to an alternate airport
- Lost procedures
- Emergency Locator Transmitter (ELT)

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:
Ground School, Chapter 26
Stage 3 Exam

Flight Training

Minimum 141 Requirements:
- Dual 1.0 hour flight
- Solo: Cross-country
  - 6 hrs flight
  - Stage check
  - 1.5 hours ground instruction
  - Stage exam

- Flight can be conducted dual or solo at the instructor’s discretion.

Objective:
For the student to gain experience in solo cross-country operations. For the Stage Check, student should demonstrate skill in the following areas according to the completion standards.

Content:
Flight A (Dual, Local, 1.0 hour)
- Preflight
- Normal takeoff and landing
- Slow Flight
- Stall series
- Steep Turns
- Ground reference maneuvers
- VOR and/or ADF Navigation
- Pilotage
- Dead Reckoning
- Postflight

Flight B (Solo Cross-Country, 2.0 hours)*
- Cross-country planning
- Instructor endorsement
- Preflight
- VOR and/or ADF Navigation
- Pilotage
- Dead Reckoning
- Flightlog kept throughout flight
- At least one landing more than 50 NM from departure airport
- Postflight

Flight C (Solo Cross-Country, 4.0 hours)*
- Cross-country planning
- Instructor endorsement
- Preflight
- VOR and/or ADF Navigation
- Pilotage
- Dead Reckoning
- Flightlog kept throughout flight
- Postflight

Completion Standards:
Flight should be coordinated and within 200 feet, 15 degrees, 10 knots, at all times, and cross-countries should be flown within 3 NM of the planned route at all times, and arrive at the en route checkpoints and destinations within 5 minutes of the initial or revised ETA.

Recommended Reading:
Flight School
Private Pilot Test Prep, Chapters 9, 10, and 11
Instructor Note: Follow the format below when signing-off the endorsement for your students. (From AC 61-65E)

1. **Endorsement for initial solo-country flight: 14 CFR 61.93(c)(1)**

   I certify that ____________________ (First name, MI, Last name) has received the required solo cross-country training. I find he/she has met the applicable requirements of §61.93, and is proficient to make solo cross-country flights in a ________________ (make and model aircraft).

   [date] J. Jones 654321 CFI [expiration date]

   Reminder: Instructor needs to endorse the student pilot certificate also, stating category only.

2. **Endorsement for each solo cross-country flight: 14 CFR §61.93(c)(2)**

   I have reviewed the cross-country planning of ____________________ (First name, MI, Last name). I find the planning and preparation to be correct to make the solo flight from ____________________ (location) to ____________________ (destination) via ____________________ (route of flight) with landings at ____________________ (name the airports) in a ____________________ (make and model aircraft) on ____________________ (date). (List any applicable conditions or limitations.)

   [date] J. Jones 654321 CFI [expiration date]

3. **Endorsement for repeated solo cross-country flights not more than 50 NM from the point of departure: 14 CFR §61.93(b)(2)**

   I certify that ____________________ (First name, MI, Last name) has received the required training in both directions between and at both ____________________ (airport names). I have determined he/she is proficient of §61.93(b)(2) to conduct repeated solo cross-country flights over that route, subject to the following conditions: ____________________ (list applicable conditions).

   [date] J. Jones 654321 CFI [expiration date]
Stage 4
Prep for Checkride

Objective
The objective of Stage 4 is for the student to gain knowledge and experience in the following:

Ground Training
- Heating effects in the atmosphere
- Wind
- Clouds and thunderstorms
- Air masses and frontal weather
- Weather reports and forecasts
- Private Practical Test Standards (PTS)
- Prep for checkride (oral)
- Take and pass the FAA Knowledge Exam

Flight Training
- The experience and knowledge required by the Private License
- Review all Private maneuvers, performed according to PTS
- Sign-off for the Private Checkride

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%. Students must take and pass the FAA Private Knowledge Exam. At the completion of this stage, student is signed off to take the Private Pilot checkride.
Stage 4 / Module 1

Ground Training

Objective:
For the student to have an understanding of wind and the heating effects in the atmosphere.

Content:
- Review objective of Stage 4

The atmosphere
- Air density
- Subdivision of the atmosphere
- Gases in air
- Standard atmosphere

Heat exchange processes
- The sun
- Terrestrial re-radiation
- General circulation
- Local heating and cooling
- Local air movements
- Temperature inversions

Wind
- Coriolis effect
- Geostrophic wind
- Gradient wind
- Surface wind
- Wind in the tropics

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

Assignment:
Ground School, Chapters 13 and 14

Flight Training

Objective:
For the student to become proficient in hood work, Slow Flight and stalls with distractions, and spin awareness.

Content:
- Preflight
- Slow Flight
- Power on/off Stalls
- Spin awareness training
- Steep Turns

Hood work
- Four basics
- Slow Flight
- Stalls
- Use of radios and navaids
- Ground reference maneuvers
- Short-field takeoffs and landings
- Soft-field takeoffs and landings
- Postflight

Completion Standards:
This module is complete when the student is within Private PTS at all times.

Recommended Reading:
Flight School

Minimum 141 Requirements:
Dual
1.0 hour flight,
0.3 instrument work
1.5 hours ground instruction

Stage 4 / Module 1

Date of Completion: ____________________________

Signature: _________________________________

Time Flown: ________________________________
Ground Training

Objective:
For the student to have an understanding of air masses, frontal weather, clouds, and thunderstorms.

Content:

Clouds

- Naming of clouds
- Moisture in the atmosphere
- Adiabatic processes
- Formation of clouds
- the Foehn (or Chinook) wind effect
- clouds formed by turbulence and mixing
- clouds formed by widespread ascent
- Precipitation from clouds

Thunderstorms

- Three necessary conditions
- instability
- moisture
- lifting force
- Life cycle
- cumulus stage
- mature stage
- dissipating stage
- Severe thunderstorms
- Embedded thunderstorms
- Danger of thunderstorms
- icing
- hailstones
- lightning strikes
- turbulence
- downbursts and microbursts
- tornadoes and water spouts

Air masses

- Origin and path
- Divergence or convergence

Frontal weather

- Warm front
- Cold front
- Occluded front
- Stationary front
- Development and decay of fronts
- Depressions — areas of low pressure
- Anticyclones — areas of high pressure
- Review night flying regulations

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

Assignment:

Ground School, Chapters 15 and 16

Flight Training

Objective:
For the student to gain experience in night flying operations, including hood work, and cross-country.

Content:

Flight A (Night, Local, 1.5 hours)

- Weather briefing
- Night preflight inspection
- Night navigation
- Area orientation
- Steep Turns
- Slow Flight
- Stalls (Power on/off)
- Instrument work
- Emergency situations and landings
- Go-arounds
- Takeoffs and landings (10, with and without panel and landing lights)
- Postflight

Flight B (Night, Cross-Country, 1.5 hours)

Flight must be more than 100NM total distance.

- Plotting course
- Preparation of flightlog
- Flight plan
- Weather briefing
- Night preflight inspection
- Cross-country
- Instrument work
- Emergency situation and landing
- Postflight

Completion Standards:
This module is complete when the student has the required 3 hours of dual night training, 10 takeoffs and landings, and completed the >100 NM dual cross-country flight. Landings should be within 400 feet of a specified point. Flight should be within 100 feet, 10 degrees, and 10 knots, while performing the maneuvers listed in the content of this module.

Recommended Reading:

Flight School

Minimum 141 Requirements:
- Dual: Night Local 1.5 hrs flight, 0.3 instrument work
- Dual: Night Cross-Country 1.5 hours flight (more than 100 NM) 2.0 hours ground instruction

Stage 4 / Module 2

Date of Completion:__________________________

Signature:_______________________________

Time Flown:_____________________________
Stage 4 / Module 3

Ground Training

Objective:
For the student to have a practical understanding of weather reports and forecasts.

Content:
Weather reports
- Weather depiction chart
- Surface analysis chart
- Radar summary chart
- METAR
- Pilot weather reports (PIREPs)

Weather forecasts
- Low-level significant weather prognostic charts
- Terminal Aerodrome forecast (TAF)
- Aviation Area forecast (FA)
- TWEB Route forecast
- Weather advisories
  - AIRMETs (WA)
  - SIGMETs (WS)
  - Convective SIGMETs (WST)
  - Center Weather Advisories (CWA)
- VFR not recommended
- Convective outlook
- Winds and temperature aloft forecast (FD)
- Severe weather outlook charts (AC)

Staying informed in the air
- EFAS
- TWEB
- SIGMET
- AIRMET
- HIWAS
- ATIS
- AWOS
- ASOS

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

Assignment:
Ground School, Chapter 18

Flight Training

Objective:
For the student to gain experience in solo, night, and cross-country operations.

Content:
- Plotting course
- Flightlog
- Instructor endorsement
- Preflight
- Filing flight plan (round robin)
- Night flight operations
- Cross-country flying
- Postflight

Completion Standards:
This module is complete when the student has gained proficiency in night and cross-country operations.

Recommended Reading:
Flight School

Minimum 141 Requirements:
* Solo: Cross-Country, Night
  2.0 hours flight
  1.5 hours ground instruction
* Flight can be conducted dual or solo, at instructor’s discretion.

Stage 4 / Module 3

Date of Completion: ________________________

Signature: ________________________________

Time Flown: ______________________________
Stage 4 / Module 4

Ground Training

Objective:
For the student to gain complete proficiency in all areas included in the Private Practical Test Standards.

Content:
- Review the Private Practical Test Standards (PTS)

Assignment:
Review the Private Practical Test Standards (PTS)

Flight Training

Objective:
For the student to become proficient in all private maneuvers, in preparation for the checkride.

Content:
- Preflight
- Slow Flight
- Steep Turns
- Stalls (Power on/off)
- VOR radial interception and orientation
- S-turns
- Turns Around a Point
- Rectangular Course
- Emergency landings
- Short-field takeoffs and landings
- Soft-field takeoffs and landings
- Crosswind takeoffs and landings
- Slips to landings
- Postflight

Completion Standards:
This module is complete when all the private maneuvers are completed according to PTS.

Recommended Reading:
Flight School

Minimum 141 Requirements:
*Solo
1.0 hour flight
1.5 hours ground instruction

* Flight can be conducted dual or solo, at instructor’s discretion.

Stage 4 / Module 4

Date of Completion: ____________________________

Signature: ____________________________

Time Flown: ____________________________
Flight Training

Objective:
For the student to become proficient in all private maneuvers, in preparation for the checkride.

Content:
- Preflight
- Slow Flight
- Steep Turns
- Stalls (Power on/off)
- VOR radial interception and orientation
- S-turns
- Turns Around a Point
- Rectangular Course
- Emergency landings
- Short-field takeoffs and landings
- Soft-field takeoffs and landings
- Crosswind takeoffs and landings
- Slips to landings
- Postflight

Completion Standards:
This module is complete when all the private maneuvers are completed according to PTS.

Recommended Reading:
Flight School

Optional Stage 4 Review

Lesson Time: Dual 1.0 hour flight, or whatever is necessary to meet objective.
1.5 hours ground instruction, or whatever is necessary to meet objective.
Stage 4 / Module 5 and Stage Check

Ground Training

Objective:
For the student to take and pass the FAA Private Pilot Knowledge Exam, and become proficient in all areas required for the private oral exam portion of the checkride.

Content:
- Review all private pilot subject matter from the Private Practical Test Standards
- Suggested review material: Private Oral Exam Guide

Completion Standards:
Stage 4 Exam must be passed with a minimum passing score of 80%, and reconciled to 100%.

Assignment:
Suggested reading: review Private Oral Exam Guide
Stage 4 Exam
FAA Private Pilot Knowledge Exam

Flight Training

Objective:
For the student to become competent to pass the private pilot checkride. For the Stage Check, student should demonstrate skill in the following areas according to the completion standards.

Content:
- Weather briefing— current, forecast, winds, go-no go decision
- Weight and Balance
- Aircraft paperwork
- Cross-country planning
- Preflight
- Starting procedures
- Taxi
- Run-up
- Climb out at Vx andVy
- Cross-country flying
- Instrument work: four basics, Slow Flight, stalls, unusual attitudes
- Slow Flight
- Stalls (Power on/off)
- Spin awareness and avoidance
- Steep Turns
- Emergency situations/landings
- Turns Around a Point
- S-turns
- Rectangular Course
- Soft-field takeoffs and landings
- Short-field takeoffs and landings
- Crosswind takeoffs and landings
- Forward slips to landing
- Radio work — nav and com
- Postflight procedures

Completion Standards:
This module is complete when all the maneuvers and aeronautical knowledge are demonstrated according to the PTS.

Recommended Reading:
Flight School
Private Pilot Test Prep, Chapters 6, 7, and 8

Minimum 141 Requirements:
Dual, 1.5 hours flight,
0.3 instrument work
Stage check
2.0 hours ground instruction
Stage exam
Instructor Note: Follow the formats below when signing-off endorsements for your students. (From AC 61-65E)

1. Endorsement for aeronautical knowledge: 14 CFR §§ 61.35(a)(1), 61.103(d), and 61.105

I certify that __________________________ (First name, MI, Last name) has received the required training in accordance with § 61.105. I have determined he/she is prepared for the Private Pilot Airplane Knowledge Exam.

[date] J. Jones 654321 CFI [expiration date]

2. Endorsement for flight proficiency practical test: 14 CFR §§ 61.103(f), 61.107(b), and 61.109

I certify that __________________________ (First name, MI, Last name) has received the required training in accordance with § 61.107 and § 61.109. I have determined he/she is prepared for the Private Pilot Airplane Practical Test.

[date] J. Jones 654321 CFI [expiration date]

Confirm for the Checkride:
- Graded pre-solo written exam
- Current Student Pilot certificate
- Each solo cross-country endorsed
- 90-day current solo endorsement (if necessary)
- Student certificate endorsed by instructor
- Application form completely filled out
- Logbook and necessary supplies readily accessible
- Materials necessary for planning a cross-country flight
- FAA Knowledge Exam results
- Identification with photo and signature
- Instructor endorsements for checkride
- Graduation certificate
- Examiners’s fee
- Current Medical
FAA Form 8710-1, Airman Certificate 
and/or Rating Application 
Supplemental Information and Instructions

Paperwork Reduction Act Statement:
The information collected on this form is necessary to determine applicant eligibility for airman ratings. We estimate it will take 15 minutes to complete this form. The information collected is required to obtain a benefit and becomes part of the Privacy Act system of records DOT/FAA 847, General Air Transportation Records on Individuals. Please note that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control number associated with this collection is 2120-0021.

Privacy Act
The information on the accompanying form is solicited under authority of Title 14 of the Code of Federal Regulations (14 CFR), Part 61. The purpose of this data is to be used to identify and evaluate your qualifications and eligibility for the issuance of an airman certificate and/or rating. Submission of all requested data is mandatory, except for the Social Security Number (SSN) which is voluntary. Failure to provide all the required information would result in you not being issued a certificate and/or rating. The information would become part of the Privacy Act system of records DOT/FAA 847, General Air Transportation Records on Individuals. The information collected on this form would be subject to the published routine uses of DOT/FAA 847. Those routine uses are: (a) To provide basic airmen certification and qualification information to the public upon request. (b) To disclose information to the national Transportation Safety Board (NTSB) in connection with its investigation responsibilities. (c) To provide information about airmen to Federal, state, and local law enforcement agencies when engaged in the investigation and apprehension of drug violators. (d) To provide information about enforcement actions arising out of violations of the Federal Aviation regulations to government agencies, the aviation industry, and the public upon request. (e) To disclose information to another Federal agency, or to a court or an administrative tribunal, when the Government or one of its agencies is a party to a judicial proceeding before the court involved in administrative proceedings before the tribunal.

Submission of your Social Security Number is voluntary. Disclosure of your SSN will facilitate maintenance of your records which are maintained in alphabetical order and cross-referenced with your SSN and airman certificate number to provide prompt access. In the event of nondisclosure, a unique number will be assigned to your file.

See Privacy Act Information above. Detach this part before submitting form.

Instructions for completing this form (FAA 8710-1) are on the reverse. If an electronic form is not printed on a duplex printer, the applicant's name, date of birth, and certificate number (if applicable) must be furnished on the reverse side of the application. This information is required for identification purposes. The telephone number and E-mail address are optional.

Tear off this cover sheet before submitting this form.
AIRMAN CERTIFICATE AND/OR RATING APPLICATION INSTRUCTIONS FOR COMPLETING FAA FORM 8710-1

I. APPLICATION INFORMATION. (Check appropriate block(s)).

Block A. Name. Enter legal name. Use no more than one middle name for record purposes. Do not change the name on subsequent applications unless it is done in accordance with 14 CFR Section 61.25. If you do not have a middle name, enter “NMN.” If you have a middle initial only, indicate “Initial only.” If you are a Jr., or a II, or III, so indicate. If you have an FAA certificate, the name on the application should be the same as the name on the certificate unless you have had it changed in accordance with 14 CFR Section 61.25.

Block B. Social Security Number. Optional: See supplemental Information Privacy Act. Do not leave blank: Use only US Social Security Number. Enter either “SSN” or the words “Do Not Use” or “None.” SSN’s are not supplemented on certificates.

Block C. Date of Birth. Check for accuracy. Enter eight digits: Use numeric characters, i.e., 07-09-1925 instead of July 9, 1925. Check to see that DOB is the same as it is on the medical certificate.

Block D. Place of Birth. If you were born in the USA, enter the city and state where you were born. If the city is unknown, enter the county and state. If you were born outside the USA, enter the name of the city and country where you were born.

Block E. Permanent Mailing Address. Enter residence number and street, P.O. Box or rural route number in the top part of the block above the line. The City, State, and ZIP code go in the bottom part of the block below the line. Check for accuracy. Make sure the numbers are not transposed. FAA policy requires that you use your permanent mailing address.

Justification must be provided on a separate sheet of paper signed and submitted with the application when a PO Box or rural route number is used in place of your permanent physical address. A map or directions must be provided if a physical address is unavailable.

Block F. Citizenship. Check USA if applicable. If not, enter the country where you are a citizen.

Block G. Do you read, speak, write and understand the English language? Check yes or no.

Block H. Height. Enter your height in inches. Example: 5’8” would be entered as 68 in. No fractions, use whole inches only.

Block I. Weight. Enter your weight in pounds. No fractions, use whole pounds only.

Block J. Hair. Spell out the color of your hair. If bald, enter “Bald.” Color should be listed as black, red, brown, blond, or gray. If you wear a wig or toupee, enter the color of your hair under the wig or toupee.

Block K. Eyes. Spell out the color of your eyes. The color should be listed as blue, brown, black, hazel, green, or gray.

Block L. Sex. Check male or female.

Block M. Do You Now Hold or Have You Ever Held An FAA Pilot Certificate? Check yes or no. (NOTE: A student pilot certificate is a “Pilot Certificate.”)

Block N. Grade of Pilot Certificate. Enter the grade of pilot certificate (i.e., Student, Recreational, Private, Commercial, or ATP). Do NOT enter flight instructor certificate information.

Block O. Certificate Number. Enter the number as it appears on your pilot certificate.

Block P. Date Issued. Enter the date your pilot certificate was issued.

Block Q. Do You Now Hold A Medical Certificate? Check yes or no. If yes, complete Blocks R, S, and T.

Block R. Class of Certificate. Enter the class as shown on the medical certificate, i.e., 1st, 2nd, or 3rd class.

Block S. Date Issued. Enter the date your medical certificate was issued.

Block T. Name of Examiner. Enter the name as shown on medical certificate.

Block U. Narcotics, Drugs. Check appropriate block. Only check “Yes” if you have actually been convicted. If you have been charged with a violation which has not been adjudicated, check “No”.

Block V. Date of Final Conviction. If block “U” was checked “Yes” give the date of final conviction.

II. CERTIFICATE OR RATING APPLIED FOR ON BASIS OF:

Block A. Completion of Required Test.

1. AIRCRAFT TO BE USED. (If flight test required) – Enter the make and model of each aircraft used. If simulator or FTD, indicate. A TOTAL TIME IN THIS AIRCRAFT (Hrs.) – (a) Enter the total Flight Time in each make and model. (b) Pilot-In-Command Flight Time - In each make and model.

Block B. Military Competence Obtained In. Enter your branch of service, date rated as a military pilot, your rank, or grade and service number. In block 4a or 4b, enter the make and model of each military aircraft used to qualify (as appropriate).

Block C. Graduate of Approved Course.

1. NAME AND LOCATION OF TRAINING AGENCY/CENTER. As shown on the graduation certificate. Be sure the location is entered.

2. AGENCY SCHOOL/CENTER CERTIFICATION NUMBER. As shown on the graduation certificate. Indicate if 142 training center.

3. CURRICULUM FROM WHICH GRADUATED. As shown on the graduation certificate.

4. DATE. Date of graduation from indicated course. Approved course graduate must also complete Block “A” COMPLETION OF REQUIRED TEST.

Block D. Holder of Foreign License Issued By.

1. COUNTRY. Country which issued the license.

2. GRADE OF LICENSE. Grade of license issued, i.e., private, commercial, etc.

3. NUMBER. Number which appears on the license.

4. RATINGS. All ratings that appear on the license.

Block E. Completion of Air Carrier’s Approved Training Program.

1. Name of Air Carrier.

2. Date program was completed.

3. Identify the Training Curriculum.

III. RECORD OF PILOT TIME. The minimum pilot experience required by the appropriate regulation must be entered. It is recommended, however, that ALL pilot time be entered. If decimal points are used, be sure they are legible. Night flying must be entered when required. You should fill in the blocks that apply and ignore the blocks that do not. Second In Command “SIC” time used may be entered in the appropriate blocks. Flight Simulator, Flight Training Device and PCATD time may be entered in the boxes provided. Total, Instruction received, and Instrument Time should be entered in the top, middle, or bottom of the boxes provided as appropriate.

IV. HAVE YOU FAILED A TEST FOR THIS CERTIFICATE OR RATING? Check appropriate block.

V. APPLICANT’S CERTIFICATION.

A. SIGNATURE. The way you normally sign your name.

B. DATE. The date you sign the application.
Airman Certificate and/or Rating Application

I. Application Information
   - Student
   - Recreational
   - Private
   - Commercial
   - Airline Transport
   - Instrument
   - Additional Rating
     - Airplane Single-Engine
     - Airplane Multiengine
     - Rotorcraft
     - Balloon
     - Airship
     - Glider
     - Powered-Lift
   - Flight Instructor Initial
   - Renewal
   - Reinstatement
   - Additional Instructor Rating
   - Ground Instructor
   - Medical Flight Test
   - Recurrence
   - Reissuance of certificate

A. Name (Last, First, Middle)
B. SSN (US Only)
C. Date of Birth Month Day Year
D. Place of Birth

E. Address
   - City
   - State, Zip Code

F. Citizenship
   - USA
   - Other:

G. Do you read, speak, write, & understand the English language?
   - Yes
   - No

H. Height
   - Weight
   - Hair
   - Eyes
   - Sex

M. Do you now hold, or have you ever held an FAA Pilot Certificate?
   - Yes
   - No

N. Grade Pilot Certificate
O. Certificate Number
P. Date Issued

Q. Do you hold a Medical Certificate?
   - Yes
   - No

R. Class of Certificate
S. Date Issued
T. Name of Examiner

U. Have you ever been convicted for violation of any Federal or State statute relating to narcotic drugs, marijuana, or depressant or stimulant drugs or substances?
   - Yes
   - No

V. Date of Final Conviction

II. Certificate or Rating Applied For on Basis of:

   A. Completion of Required Test
      1. Aircraft to be used (if test flight required)
      2. Total time in this aircraft, SIM / FTQ
      3. Pilot in command
      4. Aircraft flown 10 hours PIC in last 12 months in the following Military Aircraft:
      5. US Military PIC & Instrument check in last 12 months (List Aircraft)

   B. Military Competence
      1. Service
      2. Date Rated
      3. Rank or Grade and Service Number

   C. Graduate of Approved Course
      1. Name and Location of Training Agency or Training Center
      2. Certification Number
      3. Curriculum From Which Graduated
      4. Date

   D. Holder of Foreign License
      1. Country
      2. Grade of License
      3. Number

   E. Completion of Air Center's Approved Training Program
      1. Name of Air Center
      2. Date
      3. Which Curriculum

III. RECORD OF PILOT TIME (Do not write in the shaded areas.)

<table>
<thead>
<tr>
<th>Type</th>
<th>Instruction Received</th>
<th>Date Pilot in Command (PIC)</th>
<th>Cross Country Instruction Received</th>
<th>Cross Country PIC</th>
<th>Instrument Flight</th>
<th>Night Flight</th>
<th>Weight Limit</th>
<th>Night Take-Off</th>
<th>Night Landing</th>
<th>Number of Flights</th>
<th>Number of Flight Landings</th>
<th>Number of Powered Landings</th>
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<td>Airplanes</td>
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</tr>
</tbody>
</table>

IV. Have you failed a test for this certificate or rating?
   - Yes
   - No

V. Applicant's Certification
   - I certify that all statements and answers provided by me on this application form are complete and true to the best of my knowledge and I agree that they are to be considered as part of the basis for issuance of any FAA certificate to me. I have also read and understand the Privacy Act statement that accompanies this form.

Signature of Applicant
Date

FAA Form 8710-1 (4-06) Supersedes Previous Edition

Aviation Supplies & Academics, Inc.

Private Pilot Syllabus 41
Instructor’s Recommendation

I have personally instructed the applicant and consider this person ready to take the test.

Date
Instructor’s Signature
(Print Name & Sign)
Certificate No.
Certificate Expires

Air Agency’s Recommendation

The applicant has successfully completed our ______________________ course, and is recommended for certification or rating without further ______________________ test.

Date
Agency Name and Number
Officials Signature
Title

Designated Examiner or Airman Certification Representative Report

☐ Student Pilot Certificate Issued (Copy attached)
☐ I have personally reviewed this applicant's pilot logbook and/or training record, and certify that the individual meets the pertinent requirements of 14 CFR Part 61 for the certificate or rating sought.
☐ I have previously reviewed this applicant's graduation certificate and found it to be appropriate and in order, and have returned the certificate.
☐ I have personally tested and/or verified this applicant in accordance with pertinent procedures and standards with the result indicated below:
   ☐ Approved – Temporary Certificate Issued (Original Attached)
   ☐ Disapproved – Disapproval Notice Issued (Original Attached)

Location of Test (Facility, City, State)

Certificate or Rating for Which Tested
Type(s) of Aircraft Used
Registration No(s)

Date
Examiner’s Signature
(Print Name & Sign)
Certificate No.
Designation No.
Designation Expires

Evaluator’s Record (Use For ATP Certificate and/or Type Ratings)

Inspector
Examiner
Signature and Certificate Number
Date

☐ Oral
☐ Approved Simulator Training Device Check
☐ Aircraft Flight Check
☐ Advanced Qualification Program

Aviation Safety Inspector or Technician Report

I have personally tested this applicant in accordance with or have otherwise verified that this applicant complies with pertinent procedures, standards, policies, and necessary requirements with the result indicated below.

☐ Approved – Temporary Certificate Issued (Original Attached)
☐ Disapproved – Disapproval Notice Issued (Original Attached)

Location of Test (Facility, City, State)

Certificate or Rating for Which Tested
Type(s) of Aircraft Used
Registration No(s)

☐ Student Pilot Certificate Issued
☐ Examiners Recommendation
☐ Military Competence
☐ Reissue or Exchange of Pilot Certificate
☐ Approved Course Graduate
☐ Special Medical Test Conducted -- Report Forwarded to Aeronautical Certification Branch, AAM-330
☐ Other Approved FAA Qualification Criteria
☐ Instructor Renewal Based on
☐ Activity
☐ Instructor
☐ Training Course
☐ Test
☐ Duties and Responsibilities

Training Course (IRC) Name
Graduation Certificate No.

Date
Inspector’s Signature
(Print Name & Sign)
Certificate No.
FAA District Office

Attachments:
☐ Student Pilot Certificate (Copy)
☐ Knowledge Test Report
☐ Temporary Airman Certificate
☐ Notice of Disapproval
☐ Superseded Airman Certificate
☐ Airman’s Identification (ID)

ID:
Name:
Date of Birth:
Certificate Number:
Telephone Number:
E-Mail Address

FAA Form 8710-1 (4-00) Supersedes Previous Edition

NSN: 0052-00-682-5007
Stage 1 Exam
Introduction to Flying

Circle the most correct answer choice.

1. How many hours are required for completion of the Private Pilot Certificate, following a Part 141 program?
   A — 35 hours of flight training, 35 hours of ground training.
   B — 40 hours of flight training, 35 hours of ground training.
   C — 73 hours of flight training, 40 hours of ground training.

2. What has to be completed before a student can move on to the next Module?
   A — A student must complete the review questions following each reading assignment.
   B — A student must meet the objective specified for each module.
   C — Both A and B.

3. What document(s) must be in your personal possession while operating as pilot-in-command of an aircraft?
   A — Certificates showing accomplishment of a checkout in the aircraft and a current biennial flight review.
   B — A pilot certificate with an endorsement showing accomplishment of an annual flight review and a pilot logbook showing recency of experience.
   C — An appropriate pilot certificate, photo ID, and an appropriate current medical certificate.

4. Safety belts are required to be properly secured about which persons in an aircraft and when?
   A — Pilots only, during takeoffs and landings.
   B — Passengers, during taxi, takeoffs, and landings only.
   C — Each person on board the aircraft during the entire flight.

5. What tolerances must be maintained in order to perform Slow Flight according to the Private Practical Test Standards?
   A — Altitude must be lower than 1,500 feet AGL, and airspeed maintained at 1.2 $V_{S1}$, $+10/-5$.
   B — Airspeed must be just above stall speed with altitude maintained at $±100$ feet, and heading $±10°$.
   C — Altitude must be no lower than 1,500 feet AGL, and altitude maintained at $±100$ feet, and heading $±10°$.

6. Which three flight instruments are particularly important at Slow Flight if accuracy is required and a stall is to be avoided?
   A — Airspeed indicator, altimeter, coordination ball.
   B — Coordination ball, airspeed indicator, heading indicator.
   C — Airspeed indicator, altimeter, vertical speed indicator.

7. A pilot should announce the first indication of a Stall when
   A — the airplane buffets or decay of control effectiveness.
   B — the stall warning horn is activated.
   C — both A and B.

8. What tolerances must be maintained to perform a Stall according to the Private Practical Test Standards?
   A — Altitude must remain above 1,500 feet AGL, heading $±10°$, and recovery promptly made.
   B — Altitude must remain above 3,000 feet AGL, heading $±10°$, and recovery promptly made.
   C — Announce first indication of stall, maintain heading $±15°$, and recover promptly.

9. According to the Private Practical Test Standards, a Steep Turn must be performed maintaining
   A — a coordinated 360° turn, with a 50° bank, $±5°$, rolling out on the entry heading, $±10°$.
   B — a 45° bank, $±10°$, while coordinating a 360° turn.
   C — $±100$ feet, $±10$ knots, $V_A$ or recommended entry speed, and coordination.
10. What should a pilot do if the airplane continues to lose altitude while performing a Steep Turn?
A — Briskly pull back on the control wheel to bring the nose above the horizon.
B — Add power and wait for the airplane to regain the altitude.
C — Roll out of the turn, and try again once the entry requirements are re-established.

11. In preflighting an aircraft, what is the minimum expected of a pilot prior to every flight?
A — Drain fuel from each quick drain.
B — Perform a walk-around inspection of the aircraft.
C — Check the required documents are aboard the aircraft.

12. Why is the use of a written checklist recommended for preflight inspection and engine start?
A — To ensure that all necessary items are checked in a logical sequence.
B — For memorizing the procedures in an orderly sequence.
C — To instill confidence in the passengers.

13. The Four Basics of flight consist of:
A — Power off stall, Power on stall, Slow flight, and Steep turns.
B — Straight and level, Takeoffs, Landings, Turns.
C — Straight and level, Turns, Climbs, Descents.

14. What force makes an airplane turn?
A — The horizontal component of lift.
B — The vertical component of lift.
C — Centrifugal force.

15. Prior to starting each maneuver, pilots should
A — check altitude, airspeed, and heading indications.
B — visually scan the entire area for collision avoidance.
C — announce their intentions on the radio.

16. The most effective method of scanning for other aircraft for collision avoidance during daylight hours is to use
A — regularly spaced concentration on the 3-, 9-, and 12-o’clock positions.
B — a series of short, regularly spaced eye movements to search each 10-degree sector.
C — peripheral vision by scanning small sectors and utilizing off-center viewing.

17. What are the six primary instruments involved in the instrument scan?
A — Airspeed indicator, heading indicator, altimeter, VOR, vertical speed indicator, attitude indicator.
B — Heading indicator, tachometer, VOR, airspeed indicator, altimeter, turn coordinator.
C — Heading indicator, altimeter, vertical speed indicator, turn coordinator, attitude indicator, airspeed indicator.

18. As VFR pilots, it is most crucial for the pilot-in-command to perform the instrument scan,
A — equally dividing his/her time between the 6 primary instruments and the engine instruments.
B — while maintaining collision avoidance by dividing his/her time between inside and outside the cockpit.
C — keeping his/her head inside the cockpit at all times.

19. Current charts must be used at all times. Sectional charts are revised
A — every 56 days.
B — no more than once a year.
C — every 6 months.

20. A sectional chart portrays
A — all aeronautical information, such as airports, airways, and special use airspace.
B — terrain relief and checkpoints such as populated places, roads, railroads, and other distinctive landmarks.
C — both A and B.

21. Steering the airplane on the ground is achieved with the use of the
A — ailerons.
B — rudder pedals.
C — elevator.
22. When taxiing with the wind coming from behind, hold the control column
   A — forward and out of the wind.
   B — neutral and into the wind.
   C — back and out of the wind.

23. Upon completion of this course, students will graduate with a
   A — student pilot certificate, with an airplane,
     single-engine, land class.
   B — private pilot certificate.
   C — private pilot certificate, with an airplane,
     single-engine, land class.

24. Students must uphold at all times
   A — FAA regulations.
   B — school requirements and procedures.
   C — both A and B.

25. In order for students to succeed in this Part 141 program
   A — all objectives must be met for each module,
     homework completed, and Stage Exams passed
     with at least an 80%.
   B — all objectives must be met for each module.
   C — all objectives must be met for each module,
     homework completed, and Stage Exams passed
     with at least a 70%.

26. The four forces acting on an airplane in flight are
   A — lift, weight, thrust, and drag.
   B — lift, weight, gravity, and thrust.
   C — lift, gravity, power, and friction.

27. An airplane said to be inherently stable will
   A — be difficult to stall.
   B — require less effort to control.
   C — not spin.

28. Lateral stability refers to the motion of the airplane about its
   A — longitudinal axis.
   B — lateral axis.
   C — vertical axis.

29. The main structural component of the wing is the
   A — rib.
   B — strut.
   C — spar.

30. Most light airplane braking systems are operated
   A — by cables.
   B — pneumatically.
   C — hydraulically.

31. Name the four strokes of a piston engine
   A — intake, induction, power, expansion.
   B — intake, compression, power, exhaust.
   C — intake, compression, power, expansion.

32. Which condition is most favorable to the development of carburetor icing?
   A — Any temperature below freezing and a relative
     humidity of less than 50%.
   B — Between 32°F and 50°F and low humidity.
   C — Between 20°F and 70°F and high humidity.

33. What type of fuel can be substituted in an aircraft if the recommended octane is not available?
   A — The next higher octane aviation gas.
   B — The next lower octane aviation gas.
   C — Unleaded automotive gas of the same
     octane rating.

34. What action can a pilot take to aid in cooling an engine that is overheating during a climb?
   A — Reduce rate of climb and increase airspeed.
   B — Reduce climb and increase rpm.
   C — Increase climb speed and increase rpm.

35. The engine fuel primer is used
   A — during normal in-flight operations.
   B — only prior to startup.
   C — at shutdown of the engine.

36. What instrument(s) will be affected if the pitot tube becomes clogged, but the static vents remain clear?
   A — Airspeed indicator.
   B — Vertical speed indicator.
   C — Both A and B.

37. In steady straight-and-level flight
   A — lift is greater than drag and thrust equals weight.
   B — weight equals lift and drag equals thrust.
   C — lift equals weight and thrust is greater than drag.
38. Which would most likely result in hyperventilation?
   A — Emotional tension, anxiety, or fear.
   B — The excessive consumption of alcohol.
   C — An extremely slow rate of breathing and insufficient oxygen.

39. Who is responsible for determining if an aircraft is in condition for safe flight?
   A — A certificated aircraft mechanic.
   B — The pilot-in-command.
   C — The owner or operator.

40. In regard to general privileges and limitations, a private pilot may
   A — act as pilot-in-command of an aircraft carrying a passenger for compensation if the flight is in connection with business or employment.
   B — share the operating expenses of a flight with a passenger.
   C — not be paid in any manner for the operating expenses of a flight.
Circle the most correct answer choice.

1. If the outside air temperature (OAT) at a given altitude is warmer than standard, the density altitude is
   A — equal to pressure altitude.
   B — lower than pressure altitude.
   C — higher than pressure altitude.

2. Which combination of atmospheric conditions will reduce aircraft takeoff and climb performance?
   A — Low temperature, low relative humidity, and low density altitude.
   B — High temperature, low relative humidity, and low density altitude.
   C — High temperature, high relative humidity, and high density altitude.

3. If the temperature/dew point spread is small and decreasing, and the temperature is 62°F, what type of weather is most likely to develop?
   A — Freezing precipitation.
   B — Thunderstorms.
   C — Fog or low clouds.

4. Which type of weather briefing should a pilot request, when departing within the hour, if no preliminary weather information has been received?
   A — An outlook briefing.
   B — An abbreviated briefing.
   C — A standard briefing.

5. What conditions are necessary for the formation of thunderstorms?
   A — High humidity, lifting force, and unstable conditions.
   B — High humidity, high temperature, and cumulus clouds.
   C — Lifting force, moist air, and extensive cloud cover.

6. When telephoning a weather briefing facility for prefight weather information, pilots should state
   A — the full name and address of the pilot-in-command.
   B — the intended route, destination, and type of aircraft.
   C — the radio frequencies to be used.

7. Who is responsible for making the go-no go decision for each flight?
   A — Pilot-in-command.
   B — Certified flight instructor.
   C — Chief flight instructor.

8. What information is necessary in order to make a go-no go decision?
   A — Permission from the chief flight instructor, chief mechanic, and weather briefer.
   B — Acceptable weather conditions, an airworthy aircraft, and an airworthy pilot.
   C — Permission from the weather briefer, an airworthy aircraft, and an airworthy pilot.

9. Two-way radio communication must be established with the Air Traffic Control facility having jurisdiction over the area prior to entering which class airspace?
   A — Class C.
   B — Class E.
   C — Class G.

10. Unless otherwise authorized, two-way radio communications with Air Traffic Control are required for landings and takeoffs
    A — at all tower controlled airports within Class D airspace only when weather conditions are less than VFR.
    B — at all tower controlled airports regardless of weather conditions.
    C — at all tower controlled airports only when weather conditions are less than VFR.
11. Which is the correct traffic pattern departure procedure to use at a noncontrolled airport?
   A — Comply with any FAA traffic pattern established for the airport.
   B — Depart in any direction consistent with safety, after crossing the airport boundary.
   C — Make all turns to the left.

12. An airport’s rotating beacon operated during daylight hours indicates
   A — that weather at the airport located in Class D airspace is below basic VFR weather minimums.
   B — there are obstructions on the airport.
   C — the Air Traffic Control tower is not in operation.

13. The official source of sunrise and sunset times is
   A — the Aeronautical Information Manual.
   B — the American Air Almanac.
   C — the Federal Aviation Regulations.

14. An aircraft departs an airport in the Eastern Daylight Time Zone at 0945 EDT for a 2-hour flight to an airport located in the Central Daylight Time Zone. The landing should be at what coordinated universal time?
   A — 1345Z.
   B — 1445Z.
   C — 1545Z.

15. In order to comply with Private Practical Test Standards, students must perform Rectangular Course
   A — at traffic pattern altitude, while maintaining altitude ±100 feet, and airspeed ±10 knots, while maintaining coordination.
   B — between 600 and 1,000 feet AGL, entering 45° to the downwind, while maintaining coordination.
   C — at traffic pattern altitude, while maintaining altitude ±100 feet, and airspeed ±10 knots, while maintaining coordination.

16. In order to comply with Private Practical Test Standards, the student must perform Rectangular Course
   A — between 600 and 1,000 feet AGL, while maintaining altitude ±100 feet, and airspeed ±10 knots, while maintaining coordination.
   B — between 600 and 1,000 feet AGL, entering 45° to the downwind, while maintaining coordination.
   C — at traffic pattern altitude, while maintaining altitude ±100 feet, and airspeed ±10 knots, while maintaining coordination.

17. In headwind conditions, the groundspeed will _______ the airspeed.
   A — exceed
   B — be less than
   C — be the same as

18. To maintain a desired track over the ground, apply
   A — a wind correction angle into the wind.
   B — a wind correction angle out of the wind.
   C — power and a steeper bank angle.

19. The numbers 9 and 27 on a runway indicate that the runway is oriented approximately
   A — 009° and 027° true.
   B — 090° and 270° true.
   C — 090° and 270° magnetic.

20. If two-way communication fails at an airport with a tower and cannot be restored, the recommended procedure is to
   A — make an off-airport landing.
   B — turn on your landing light, enter the airport area on final approach, and land as soon as possible.
   C — observe traffic flow, enter the traffic pattern on the downwind, look for light signals from the tower, and squawk 7600 on your transponder.

21. In an in-flight emergency requiring emergency action, the pilot-in-command
   A — may deviate from any rule of 14 CFR Part 91 to the extent required to meet that emergency.
   B — must not deviate from any rule of 14 CFR Part 91.
   C — may deviate from any rule of 14 CFR Part 91 but only after receiving prior permission from ATC.
22. When approaching another aircraft head-on, each pilot must alter his/her course
   A — to the left.
   B — to the right.
   C — with a descent.

23. Normal and crosswind takeoffs and landings should take place
   A — with the wind.
   B — into the wind.
   C — perpendicular to the wind.

24. When you fly solo, you are pilot-in-command, and you are required to have in your personal possession a
   A — pilot certificate and logbook.
   B — pilot certificate, photo ID, and medical certificate.
   C — CFI solo endorsement, and copy of the FAR/AIM.

25. Student pilots are responsible for all information, rules, and regulations in Parts
   A — 61, and 91.
   B — 91, and 121.
   C — 1, and 67.

26. A person may not act as a crewmember of a civil aircraft if alcoholic beverages have been consumed by that person within the preceding
   A — 8 hours.
   B — 12 hours.
   C — 24 hours.

27. List the airspeeds and their definitions, for the training aircraft to be used for solo flight:

<table>
<thead>
<tr>
<th>Speed</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-field takeoff</td>
<td>____________________________</td>
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<tr>
<td>Short-field landing</td>
<td>____________________________</td>
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<tr>
<td>Normal takeoff</td>
<td>____________________________</td>
</tr>
<tr>
<td>Normal landing</td>
<td>____________________________</td>
</tr>
<tr>
<td>Soft-field takeoff</td>
<td>____________________________</td>
</tr>
<tr>
<td>Soft-field landing</td>
<td>____________________________</td>
</tr>
<tr>
<td>Practice private pilot maneuvers</td>
<td>____________________________</td>
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<td>$V_{S0}$</td>
<td>____________________________</td>
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<tr>
<td>$V_{A}$</td>
<td>____________________________</td>
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<tr>
<td>$V_{X}$</td>
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<td>$V_{Y}$</td>
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<td>____________________________</td>
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<tr>
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<td>____________________________</td>
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<tr>
<td>$V_{NE}$</td>
<td>____________________________</td>
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<tr>
<td>Best Glide</td>
<td>____________________________</td>
</tr>
</tbody>
</table>

28. List the grade and capacity of the fuel and oil to be used in the training aircraft used for solo flight:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel</td>
<td>_____</td>
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<tr>
<td>Oil</td>
<td>_____</td>
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</tbody>
</table>

29. What do each of the following ATC light signals mean?
   A — steady green
   B — flashing green
   C — steady red
   D — flashing red
   E — flashing white
   F — alternating red and green

<table>
<thead>
<tr>
<th>Signal</th>
<th>In flight</th>
<th>On the ground</th>
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</thead>
<tbody>
<tr>
<td>Steady green</td>
<td>_____</td>
<td>_____</td>
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<tr>
<td>Flashing green</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>Steady red</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>Flashing red</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>Flashing white</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>Alternating red and green</td>
<td>_____</td>
<td>_____</td>
</tr>
</tbody>
</table>

30. What actions will you take for an engine failure:
   Immediately after takeoff ___________________________
   50 feet after takeoff ________________________________
   Downwind, in the traffic pattern ____________________
   In the practice area ________________________________
Circle the most correct answer choice.

1. The planned course is 165°, and the forecast wind is 330° at 15 knots. If the expected TAS is 145 knots, what is the required heading and groundspeed?
   A — 173° and 143 knots.
   B — 167° and 159 knots.
   C — 154° and 165 knots.

2. If you burn 7 gallons in 35 minutes, what is your rate of fuel consumption, and how long would it take to burn 10 gallons?
   A — 11.2 gallons/hour, and 68 minutes.
   B — 12.5 gallons/hour, and 38 minutes.
   C — 12 gallons/hour, and 50 minutes.

3. Which items are included in the empty weight of an aircraft?
   A — Usable fuel and undrainable oil.
   B — Only the airframe, powerplant, and optional equipment.
   C — Full fuel tanks and engine oil to capacity.

4. GIVEN: Weight Arm Moment
   (lb) (in) (lb-in)
   Empty weight 1,495.0 101.4 151,593.0
   Pilot & Pax 380.0 64.0
   Fuel (30 gal) — 96.0

   The CG is located how far aft of datum?
   A — CG 92.44.
   B — CG 94.01.
   C — CG 119.8.

5. Which combination of atmospheric conditions will reduce aircraft takeoff and climb performance?
   A — Low temperature, low relative humidity, and low density altitude.
   B — High temperature, low relative humidity, and low density altitude.
   C — High temperature, high relative humidity, and high density altitude.

6. (Refer to Exam Figure 1 on Page 3-3.) Determine the total distance required for takeoff to clear a 50-foot obstacle.
   OAT..........................Std
   Pressure altitude..................4,000 ft
   Takeoff weight..................2,800 lbs
   Headwind component..........Calm
   A — 1,500 feet.
   B — 1,750 feet.
   C — 2,000 feet.

7. (Refer to Exam Figure 2 on Page 3-4.) Determine the total distance required to land.
   OAT90°F
   Pressure altitude..................3,000 ft
   Weight..........................2,900 lbs
   Headwind component.............10 kts
   Obstacle............................50 ft
   A — 1,450 feet.
   B — 1,550 feet.
   C — 1,725 feet.

8. (Refer to Exam Figure 3 on Page 3-4.) Determine the total distance required to land over a 50-foot obstacle.
   Pressure altitude..................7,500 feet
   Headwind.........................8 kts
   Temperature..........................Std
   Runway..........................Dry grass
   A — 1,004 feet.
   B — 1,205 feet.
   C — 1,506 feet.

9. What is the time en route for the following flight?
   Distance 65 miles, true course 060° T, wind 270° T at 12 knots, TAS 110 knots. Add 2 minutes for climb-out.
   A — 34 minutes.
   B — 28 minutes.
   C — 40 minutes.
10. (Refer to Exam Figure 4 on Page 3-5.) What is the expected fuel consumption for a 500 NM flight under the following conditions?

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure altitude</td>
<td>4,000 feet</td>
</tr>
<tr>
<td>Temperature</td>
<td>+29°C</td>
</tr>
<tr>
<td>Manifold pressure</td>
<td>21.3 in. Hg</td>
</tr>
<tr>
<td>Wind</td>
<td>calm</td>
</tr>
</tbody>
</table>

A — 40.1 gallons.  
B — 31.4 gallons.  
C — 36.1 gallons.

11. Which VFR cruising altitude is acceptable for a flight on a Victor Airway with a magnetic course of 175°? The terrain is lower than 1,000 feet.

A — 4,500 feet.  
B — 5,000 feet.  
C — 5,500 feet.

12. Cloud bases in Terminal Aerodrome Forecasts are given

A — MSL.  
B — AGL.  
C — ASL.

13. You are flying MH 080, with the OBS selected to 080, CDI needle showing 2 dots right, and the FROM flag showing. Desired course is the 080 radial outbound. The desired course is

A — out to your left.  
B — out to your right.  
C — directly behind you.

14. If Air Traffic Control advises that radar service is terminated when the pilot is departing Class C airspace, the transponder should be set to code

A — 0000.  
B — 1200.  
C — 4096.

15. If you are 3 NM off-course to the right in 20 NM, what is your tracking error?

A — 9° left.  
B — 9° right.  
C — 12° right.

16. An ATC radar facility issues the following advisory to a pilot flying on a heading of 090°: “Traffic 3 o’clock, 2 miles, Westbound.” Where should the pilot look for this traffic?

A — East.  
B — South.  
C — West.

17. If you lost power at 200 feet after a maximum performance takeoff, what would your initial actions be?

A — Initiate a 180° turn back to the runway.  
B — Pitch the nose down rapidly, and land on the remaining runway.  
C — Adopt the gliding attitude to maintain flying speed and try to land approximately straight ahead.

18. According to the Private Practical Test Standards, a student is required to touchdown within _____ feet while performing a short field landing.

A — 200  
B — 400  
C — 500

19. According to the Private Practical Test Standards, the required accuracy when flying on instruments is

A — altitude ±100 feet, airspeed ±10 knots, and heading ± 10 degrees.  
B — altitude ±200 feet, airspeed ±10 knots, and heading ± 20 degrees.  
C — altitude ±200 feet, airspeed ±20 knots, and heading ± 20 degrees.

20. Approaching a VOR station while flying southwest at 8,500 feet MSL, you see a multi-engine airplane at the same altitude converging from your left, headed northwest toward the VOR. According to regulations, which pilot should give way and why?

A — The pilot of the multi-engine airplane should give way since the airplane is not flying at the proper VFR cruising altitude.  
B — The multi-engine airplane should give way since your airplane is to its right and you have the right-of-way.  
C — You should give way since the airplane is to your left and has the right-of-way.
21. In addition to other preflight action for a VFR cross-country flight, regulations specifically require the pilot-in-command to
   A — determine runway length at the airports of intended use.
   B — check each fuel tank visually to ensure that it is always filled to capacity.
   C — file a flight plan for the proposed flight.

22. If severe turbulence is encountered, the airplane’s airspeed should be reduced to
   A — maneuvering speed.
   B — the minimum steady flight speed in the landing configuration.
   C — maximum structural cruising speed.
### Exam Figure 2

**LANDING DISTANCE**

**ASSOCIATED CONDITIONS:**

<table>
<thead>
<tr>
<th>POWER</th>
<th>RETARDED TO MAINTAIN 900 FT on FINAL APPROACH</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLAPS</td>
<td>DOWN</td>
</tr>
<tr>
<td>LANDING GEAR</td>
<td>DOWN</td>
</tr>
<tr>
<td>RUNWAY</td>
<td>PAVED, LEVEL, DRY SURFACE</td>
</tr>
<tr>
<td>APPROACH SPEED</td>
<td>IAS AS TABULATED</td>
</tr>
<tr>
<td>BRAKING</td>
<td>MAXIMUM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEIGHT</th>
<th>SPEED AT 50 FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>POUNDS</td>
<td>KNOTS</td>
</tr>
<tr>
<td>2500</td>
<td>70 80</td>
</tr>
<tr>
<td>2800</td>
<td>68 78</td>
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<td>2600</td>
<td>65 75</td>
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<tr>
<td>2400</td>
<td>63 72</td>
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<tr>
<td>2200</td>
<td>60 69</td>
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</tbody>
</table>

**EXAMPLE:**

<table>
<thead>
<tr>
<th>OAT</th>
<th>25 °C (77 °F)</th>
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</thead>
<tbody>
<tr>
<td>PRESSURE ALTITUDE</td>
<td>3905 FT</td>
</tr>
<tr>
<td>WEIGHT</td>
<td>2814 LB</td>
</tr>
<tr>
<td>WIND COMPONENT</td>
<td>9.0 KNOTS (HEADWIND)</td>
</tr>
</tbody>
</table>

| GROUND ROLL | 1090 FT |
| TOTAL OVER 50 FT OBSTACLE | 1700 FT |
| APPROACH SPEED | 68 KNOTS (78 MPH) |

---

### Exam Figure 3

**LANDING DISTANCE**

**FLAPS LOWERED TO 40 °- POWER OFF HARD SURFACE RUNWAY - ZERO WIND**

<table>
<thead>
<tr>
<th>GROSS WEIGHT LB</th>
<th>APPROACH SPEED, IAS, MPH</th>
<th>AT SEA LEVEL &amp; 59 °F</th>
<th>AT 2500 FT &amp; 50 °F</th>
<th>AT 5000 FT &amp; 41 °F</th>
<th>AT 7500 FT &amp; 32 °F</th>
<th>GROUND ROLL</th>
<th>TOTAL TO CLEAR 50 FT OBS</th>
<th>GROUND ROLL</th>
<th>TOTAL TO CLEAR 50 FT OBS</th>
<th>GROUND ROLL</th>
<th>TOTAL TO CLEAR 50 FT OBS</th>
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<td>1600</td>
<td>60</td>
<td>445</td>
<td>1075</td>
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<td>1195</td>
<td>520</td>
<td>1255</td>
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<td></td>
</tr>
</tbody>
</table>

**NOTES:**

1. Decrease the distances shown by 10% for each 4 knots of headwind.
2. Increase the distance by 10% for each 60 °F temperature increase above standard.
3. For operation on a dry, grass runway, increase distances (both "ground roll" and "total to clear 50 ft obstacle") by 20% of the "total to clear 50 ft obstacle" figure.
## CRUISE POWER SETTINGS

95% MAXIMUM CONTINUOUS POWER (OR FULL THROTTLE)

2800 POUNDS

<table>
<thead>
<tr>
<th>PRESS ALT. FEET</th>
<th>IOAT °F °C</th>
<th>ENGINE SPEED RPM</th>
<th>MAN PRESS PSI</th>
<th>FUEL FLOW ENGINE GPH</th>
<th>TAS KT</th>
<th>TAS MPH</th>
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<td>63 17</td>
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<td>36  2</td>
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<td>156 180</td>
<td>7   -14</td>
<td>2450 16.1 5.1 9.4 158 180</td>
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</table>

### STANDARD DAY (ISA)

<table>
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<th>IOAT °F °C</th>
<th>ENGINE SPEED RPM</th>
<th>MAN PRESS PSI</th>
<th>FUEL FLOW ENGINE GPH</th>
<th>TAS KT</th>
<th>TAS MPH</th>
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</table>

### ISO +20 °C (+36 °F)

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<th>ENGINE SPEED RPM</th>
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<th>FUEL FLOW ENGINE GPH</th>
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<td>5.3 9.7</td>
<td>156 180</td>
<td>7   -14</td>
<td>2450 16.1 5.1 9.4 158 180</td>
</tr>
</tbody>
</table>

### NOTES:
1. Full throttle manifold pressure settings are approximate.
2. Shaded area represents operation with full throttle.

Exam Figure 4
Circle the most correct answer choice.

1. Every physical process of weather is accompanied by, or is the result of, a
   A — movement of air.
   B — pressure differential.
   C — heat exchange.

2. Convective circulation patterns associated with sea breezes are caused by
   A — warm, dense air moving inland from over the water.
   B — water absorbing and radiating heat faster than the land.
   C — cool, dense air moving inland from over the water.

3. The wind at 5,000 feet AGL is southwesterly while the surface wind is southerly. This difference in direction is primarily due to
   A — stronger pressure gradient at higher altitudes.
   B — friction between the wind and the surface.
   C — stronger Coriolis force at the surface.

4. In the Northern Hemisphere, the wind is deflected to the
   A — right by Coriolis force.
   B — right by surface friction.
   C — left by Coriolis force.

5. What conditions are necessary for the formation of thunderstorms?
   A — High humidity, lifting force, and unstable conditions.
   B — High humidity, high temperature, and cumulus clouds.
   C — Lifting force, moist air, and extensive cloud cover.

6. Clouds, fog, or dew will always form when
   A — water vapor condenses.
   B — water vapor is present.
   C — relative humidity reaches 100%.

7. One weather phenomenon which will always occur when flying across a front is a change in the
   A — wind direction.
   B — type of precipitation.
   C — stability of the air mass.

8. What are characteristics of a moist, unstable air mass?
   A — Cumuliform clouds and showery precipitation.
   B — Poor visibility and smooth air.
   C — Stratiform clouds and showery precipitation.

9. (Refer to Exam Figure 5 below.) What are the current conditions depicted for Chicago Midway Airport (KMDW)?
   A — Sky 700 feet overcast, visibility 1-1/2 SM, rain.
   B — Sky 7000 feet overcast, visibility 1-1/2 SM, heavy rain.
   C — Sky 700 feet overcast, visibility 11, occasionally 2 SM, with rain.

 METAR KINK 12845Z 11012G18KT 15SM SKC 25/17 A3000
 METAR KBOI 121854Z 13004KT 30SM SCT150 17/6 A3015
 METAR KLAX 121852Z 25004KT 6SM BR SCT007 SCT250 16/15 A2991
 SPECI KMDW 121856Z 32005KT 1 1/2SM RA OVC007 17/16 A2980 RMK RAB35
 SPECI KJFK 121853Z 18004KT 1/2SM FG R04/2200 OVC005 20/18 A3006

Exam Figure 5
10. From which primary source should information be obtained regarding expected weather at the estimated time of arrival if your destination has no Terminal Aerodrome Forecast?
   A — Low-level Prognostic Chart.
   B — Weather Depiction Chart.
   C — Aviation Area Forecast.

11. The spin is a condition of
   A — stalled, coordinated flight.
   B — stalled, uncoordinated flight.
   C — unstalled, uncoordinated flight.

12. A 10-knot wind at 45° to the runway direction will cause a crosswind component of
   A — 7 knots.
   B — 10 knots.
   C — 4 knots.

13. Compared with a normal full-flap approach, a zero-flap approach will require
   A — a steeper flight path, slower approach speed, lower nose attitude, and shorter ground roll.
   B — a shallower flight path, slower approach speed, higher nose attitude, and shorter ground roll.
   C — a shallower flight path, faster approach speed, higher nose attitude, and longer ground roll.

14. A forward slip can be used to
   A — steepen an approach.
   B — flatten an approach.
   C — extend an approach.

15. What tolerances must be maintained in order to perform Slow Flight according to the Private Practical Test Standards?
   A — Altitude must be lower than 1,500 feet AGL, and airspeed maintained at 1.2 $V_{S1}$, $+10/-5$.
   B — Airspeed must be just above stall speed with altitude maintained at $±100$ feet, and heading $±10°$.
   C — Altitude must be no lower than 1,500 feet AGL, and altitude maintained at $±100$ feet, and heading $±10°$.

16. What tolerances must be maintained to perform Stalls according to the Private Practical Test Standards?
   A — Altitude must remain above 1,500 feet AGL, heading $±10°$, and recovery promptly made.
   B — Altitude must remain above 3,000 feet AGL, heading $±10°$, and recovery promptly made.
   C — Announce first indication of stall, maintain heading $±15°$, and recover promptly.

17. According to the Private Practical Test Standards, a Steep Turn must be performed maintaining
   A — a coordinated 360° turn, with a 50° bank, $±5°$, rolling out on the entry heading, $±10°$.
   B — a 45° bank, $±10°$, while coordinating a 360° turn.
   C — $±100$ feet, $±10$ knots, $V_A$ or recommended entry speed, and coordination.

18. In order to comply with Private Practical Test Standards, students must perform Turns Around a Point and S-turns
   A — at traffic pattern altitude, while maintaining altitude $±100$ feet, and airspeed $±10$ knots, while maintaining coordination.
   B — between 600 and 1000 feet AGL, while maintaining altitude $±100$ feet, and airspeed $±10$ knots, while maintaining coordination.
   C — at traffic pattern altitude, while maintaining altitude $±100$ feet, and heading $±10°$, while maintaining coordination.

19. In order to comply with Private Practical Test Standards, student must perform Rectangular Course
   A — between 600 and 1,000 feet AGL, while maintaining altitude $±100$ feet, and airspeed $±10$ knots, while maintaining coordination.
   B — between 600 and 1,000 feet AGL, entering 45° to the downwind, while maintaining coordination.
   C — at traffic pattern altitude, while maintaining altitude $±100$ feet, and airspeed $±10$ knots, while maintaining coordination.
20. According to the Private Practical Test Standards, a student is required to touchdown within ______ feet while performing a short field landing.
   A — 200
   B — 400
   C — 500

21. According to the Private Practical Test Standards, the required accuracy when flying on instruments is
   A — altitude ±100 feet, airspeed ±10 knots, and heading ± 10°.
   B — altitude ±200 feet, airspeed ±10 knots, and heading ± 20°.
   C — altitude ±200 feet, airspeed ±20 knots, and heading ± 20°.

22. The normal takeoff will use
   A — full power and the mixture rich.
   B — reduced power and the mixture significantly leaned.
   C — full power and the mixture significantly leaned.
Basic ATD Syllabus

Course Objective
To supplement traditional flight training with improvements made possible with the On Top Basic ATD. Instructors are encouraged to use On Top creatively in producing scenario-based training that goes beyond the development of base motor skills.

Minimum Requirements
Flight instruction received with the On Top Basic ATD is loggable for Private Pilot training under Federal Aviation Regulations:

- 14 CFR 61.109 k)(1); 2.5 hours towards the Private Pilot experience requirements.
- 14 CFR 141.57; any number of hours deemed appropriate by the school when conducting a special curricula dedicated to pilot proficiency.

Notes for Instructors
A Basic ATD or PCATD can effectively be integrated with ongoing training as a supplemental training tool.

Concepts are much easier to demonstrate and/or explain in a controlled and noiseless simulator environment. Take advantage of the pause button!

Flight schools can maximize the usefulness of the Basic ATD by leaving the unit on and accessible to instructors during periods of ongoing flight training. Instructors who can make free use of the device for specific discussions/skills development will maximize their students’ training value. This is an inherent benefit to having computer based training available to the instructing staff.

Instructors should individually spend 2 to 3 hours apiece becoming familiar with the Basic ATD themselves in order to get comfortable with flight characteristics and functionality.

Important* Remember that primary students who do any flying in On Top will naturally tend to favor the gauges once they transition to an airplane. It is critical to employ integrated instruction techniques from the outset. Cover the airplane instrument panel if needed!

Use the following syllabus as a guide to implementing this technology with your overall training, but also as a starting point for even more diverse applications. There is no set limit to the usefulness of a Basic ATD in accomplishing your flight training objectives.
Lesson Placement
The following Modules may be supplemented using an approved Basic ATD in lieu of an airplane. The following Modules are suggested because the associated tasks and placement within the curriculum lend themselves particularly well to an integrated flight training environment:

<table>
<thead>
<tr>
<th>Basic ATD Lesson</th>
<th>The Pilot’s Manual: Private Pilot Syllabus</th>
<th>Lesson time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson 1</td>
<td>Stage 1/Module 1</td>
<td>0.5 hr</td>
</tr>
<tr>
<td>Lesson 2</td>
<td>Stage 1/Module 3</td>
<td>0.5 hr</td>
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<tr>
<td>Lesson 3</td>
<td>Stage 1/Module 4</td>
<td>0.5 hr</td>
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<tr>
<td>Lesson 4</td>
<td>Stage 2/Module 3</td>
<td>0.5 hr</td>
</tr>
<tr>
<td>Lesson 5</td>
<td>Stage 2/Module 4</td>
<td>0.5 hr</td>
</tr>
<tr>
<td>Lesson 6</td>
<td>Stage 3/Module 1</td>
<td>0.5 hr</td>
</tr>
<tr>
<td>Lesson 7</td>
<td>Stage 3/Module 4</td>
<td>0.5 hr</td>
</tr>
<tr>
<td>Lesson 8</td>
<td>Stage 3/Module 3</td>
<td>0.5 hr</td>
</tr>
</tbody>
</table>

Total Loggable Time on Basic ATD: 2.5 hr

Specialized Flight Tasks—Optional Review

Objective
To utilize the Basic ATD environment to enhance specific flight skills.

While not comprehensive, this list is meant to offer instructors some suggestions on how to augment traditional instruction with the Basic ATD. Both instructors and students are encouraged to implement the device in ways that go beyond logging the hours.

Content
- Go-around procedures
- Radio procedures (various airspace)
- Airspace navigation (using VOR/DME)
- Power off stalls (only procedures, not the physical skills)
- Power on stalls (only procedures, not the physical skills)
- Positioning controls for wind during taxi
- Side slipping on approach for crosswind (control inputs, not the actual landing)
- Lost communications
Lesson 1: Indoctrination

Lesson time: 0.5 hour

Objective:
For the student to gain familiarization with aircraft control and instrument interpretation.

Content:
- Functionality and use of primary flight controls
- Functionality and use of primary engine controls
- Functionality of the basic flight instruments
- Operation of the engine controls and interpretation of the engine instruments
- Use of elevator trim
- Straight and level
- Relationship between pitch and airspeed/rate of climb
- Effects of changing power
- Pre-maneuver checks (general)
- Turns
  - Attitude indicator
  - Rate of turn and angle of bank
  - Level turns

Completion Standards:
Student is able to maintain flight within 400 feet altitude, 20 degrees of heading, and 20 knots while performing the maneuvers listed.

Lesson 2: Primary Flight Skills

Lesson time: 0.5 hour

Objective:
For the student to learn and practice techniques for turning flight and slow flight. Emphasis will be on underlying principles and set-up of the maneuvers.

Content:
- Pre-maneuver checks
- Straight and level at target airspeeds
- Level turns — 10, 20, 30 degrees of bank
  - Inclinometer — slips/skids
  - Standard rate turns
  - Turn coordination
  - Shallow turns — explanation of adverse yaw, proper rudder technique
  - Steeper turns — explanation of horizontal component of lift
- Turns to a heading

Completion Standards:
The student should be able to complete turns to within 20 degrees of a specified heading. During slow flight, student maintains altitude within 400 feet, heading within 20 degrees, airspeed within 20 knots.

Lesson 3: Basic Flight Skills

Lesson time: 0.5 hour

Objective:
For the student to combine previously learned skill sets and practice turns to headings while climbing/descending and leveling off.

Content:
- Pre-maneuver checks (general)
- Level-off techniques — climbs and descents
- Constant airspeed climbs/descents to attitude
- Constant rate climbs/descents to altitude
- Climbing and descending turns to a heading and altitude
- Slow flight
  - Discussion of airplane performance with high induced drag
  - Discussion of pitch and power use during the maneuver
  - Maneuver set up
  - Exploring performance at 60 knots (C172)
  - Climbs on heading
  - Descents on heading
  - Turns: climbing/descending/straight and level

Completion Standards:
Upon completion the student should be able to complete turns to within 20 degrees of a specified heading, level off within 200 feet of altitude and maintain airspeed within 15 knots.

Lesson 4: Instrument Skills/Abnormal Operations

Lesson time: 0.5 hour

Objective:
For the student to increase scanning proficiency and be introduced to instrument flying techniques. The student will also be introduced to unexpected instrument conditions including unusual attitudes.

Content:
- Basic instrument skills — scanning techniques
- Flying the numbers (pitch + power = performance)
- Basic maneuvers
- Abnormal operations
  - Inadvertently encountering IMC
  - Compass turns (and associated errors)
  - Encountering turbulence
  - Unusual attitude recovery
  - Aborted takeoff — lack of indicated airspeed (ASI can be failed, or pitot tube blocked from the failures page — click setup/failures)

Completion Standards:
Upon completion the student should be able to maintain altitude within 300 feet, heading within 15 degrees, and airspeed within 15 knots throughout maneuvering.
Lesson 5: Emergencies and Equipment Malfunctions

Lesson time:
0.5 hour

Objective:
To introduce the student to various possible emergencies as well as their corresponding recovery actions.

Content:
___ Partial or complete power loss
___ Engine roughness or overheat
___ Loss of oil pressure
___ Fuel starvation
___ Electrical malfunction
___ Vacuum/pressure, and associated flight instruments malfunction
___ Pitot/static
___ Landing gear or flap malfunction
___ Inoperative trim
___ Structural icing
___ Smoke/fire/engine compartment fire
___ Any other emergency appropriate to the airplane

Completion Standards:
Upon completion the student should have a grasp of the principles underlying the listed emergencies as well as their corrective actions.

Lesson 6: Navigation

Lesson time:
0.5 hour

Objective:
For the student to gain a practical understanding of radio navigation using the VOR and DME.

Content:
___ VOR introduction
___ Components of VOR radio and display
___ VOR navigation—concepts
___ Demonstration—note: you can effectively demonstrate the principles of navigating with the VOR from On Top’s position page (click setup/position) as well as from the map page (rewind/rewind a flight to illustrate movement of the CDI.
___ Course intercept
___ Tracking

VOR exercises
___ Plotting a course using VOR radials (using sectional chart)
___ VOR radio operation including identification and signal loss
___ VOR intercept and tracking drills including station passage
___ Dead reckoning
___ Determining position (using sectional chart)
___ DME

Completion Standards:
Upon completion the student should understand the principles of VOR navigation and DME. The student should be able to intercept and track a VOR radial while holding altitude within 300 feet, heading within 15 degrees, and airspeed within 10 knots.
Lesson 7: ADF Navigation and Lost Procedures

Lesson time:
0.5 hour

Objective:
For the student to understand the principles of radio navigation using ADF. The student will also learn how to proceed after becoming lost.

Content:
___ NDB and ADF
___ Principle of bearings and ADF display
___ Operating the ADF
___ ADF relative bearing indicator (RBI)
___ Orientation
___ ADF exercises: homing drills
___ Lost procedures
___ Initial actions
___ Determining position with VOR/ADF
___ Radio communications and radar services (using sectional chart)
___ Navigating to an airport

Completion Standards:
Upon completion the student should understand the principles of ADF radio navigation. The student should be able to home to an NDB station (or appropriate airport) using the ADF. Altitude should be within 300 feet, heading within 15 degrees and airspeed within 10 knots.

Lesson 8: Cross-Country Procedures

Lesson time:
0.5 hour

Objective:
For the student to practice a pre-planned cross-country segment and become familiar with the associated elements, including radio work and dead reckoning. The student will also practice diverting.

Content:
___ Cross-country operations
___ Obtaining weather
___ Completion of planning, including Nav Log
___ Cockpit organization
___ Simulated flight segment
___ 1. Departure
___ 2. Communications, radio advisories and warnings
___ ATIS and CTAF
___ SIGMETS, AIRMETS, NOTAMS
___ FSS communication — flight plans/flight plan changes
___ Flight following
___ 3. Intercepting course (VOR radial) after takeoff
___ 4. Enroute — Completion of Nav Log
___ 5. Dead reckoning between points A and B
___ 6. Arrival procedures
___ Diversion
___ Practicing unexpected diversion (using sectional)
___ Alternate selection
___ Estimate of heading, groundspeed, ETA and fuel

Completion Standards:
Upon completion the student should be familiar with basic cross-country operations. The student should be able to track a VOR radial, know how to divert safely and know how to handle becoming lost. Altitude should be within 300 feet, heading within 15 degrees.
This syllabus presents the most integrated and comprehensive flight training program available, along with many advantages:

- Based on *The Pilot's Manual Series*. Schools, instructors, or students can choose to supplement the program with other texts, videos, etc. This allows freedom to teach or learn the material in the most effective way—on an individual basis.

- All Part 141 requirements have been met in a logical and user-friendly manner.

- Flight lessons are presented side-by-side with their coordinating ground lessons. This integrated approach provides the most efficient path to completion, and is easier to follow than separate ground and flight training programs.

- Flexible enough to be effective for all programs.

- Includes “Optional Reviews” in each stage—allowing the student to review material when necessary, yet still follow the syllabus and maintain progress.

- Now with an Appendix allowing Basic ATD integration with your existing instructional methods!

- Every syllabus in the series includes:
  - Instructor endorsements
  - All Stage Exams needed for the program
  - Airman Certificate Rating Application and checkride checklist

Programs available for *The Pilot's Manual Series*:

**Private Pilot Syllabus** (#ASA-PM-S-P)

**Instrument Rating Syllabus** (#ASA-PM-S-I)

**Commercial Pilot Syllabus** (free download from ASA website)

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