



Principles *of* Helicopter Flight Syllabus

Second Edition

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Principles *of* Helicopter Flight Syllabus

Second Edition

A Flight & Ground
Training Course for
Private Pilot Helicopter
Certification



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Newcastle, Washington

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Contents

	About this Syllabus	v
	Enrollment/Graduation Certificates	
	SFAR 73 – Instruction in Robinson Helicopters	
Stage 1:	Introduction to Helicopter Flying	1
	Module 1.....	3
	Module 2.....	4
	Module 3.....	5
	Module 4.....	6
	Module 5.....	7
	Module 6.....	8
	Module 7.....	9
	Module 8.....	10
	Module 9.....	11
	Module 10.....	12
	Module 11.....	13
	Module 12.....	14
	Module 13.....	15
	Module 14.....	16
Stage 2:	Advanced Maneuvers and Solo Practice	19
	Module 1.....	20
	Module 2.....	21
	Module 3.....	22
	Module 4.....	23
	Module 5.....	24
	Module 6.....	25
	Module 7.....	26
	Module 8.....	27
Stage 3:	Cross-Country Flight	28
	Module 1.....	29
	Module 2.....	30
	Module 3.....	31
	Module 4.....	32
	Module 5.....	34
	Module 6.....	35
	Module 7.....	36
Stage 4:	Preparation for Checkride	37
	Module 1.....	38
	Module 2.....	39
	Module 3.....	40
	Module 4.....	41
Appendices	Stage Exams 1 – 4.....	Appendix 1-1

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 a Rotorcraft Category rating and a Helicopter 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 exceed 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, helicopter 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: In this case review flights should be scheduled to make sure flight skills are mastered before moving on. (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 the

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 helicopter.

Required Materials for the Private Pilot Rotorcraft Course:

- *Principles of Helicopter Flight* (#ASA –PHF-2)
- *Helicopter Flying Handbook* (#FAA-H-8083-21A)
- *Pilot’s Handbook of Aeronautical Knowledge* (#FAA-H-8083-25)
- FAR/AIM (#ASA-FR-AM-BK, updated annually)
- Private Pilot Rotorcraft Practical Test Standards (#FAA-S-8081-15A)

Recommended Materials for the Private Pilot Rotorcraft Course:

- *ASA Private Pilot Test Prep* (#ASA-TP-P, updated annually)
- *ASA Helicopter Fundamentals* DVD (ASA-VTP-H)
- ASA logbook (student’s choice)
- ASA flight computer (E6B or CX-2 Pathfinder)
- ASA plotter (student’s choice)
- ASA flight logs for cross-country flights (#ASA-FP-2)
- *ASA Private Pilot Oral Exam Guide* (#ASA-OEG-P)
- *ASA Helicopter Oral Exam Guide* (#ASA-OEG-H)
- Sectional for local area
- Airport/Facility Directory for local area

The syllabus uses *Principles of Helicopter Flight* for the ground training program. The review following each chapter should be finished with the assigned reading. Certain ground lessons are supplemented with reading assignments from *Pilot’s Handbook of Aeronautical Knowledge*. The *Rotorcraft Flying Handbook* is recommended to enhance the program. Each book contains 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 that 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 *Helicopter Flying Handbook* (FAA-H-8083-21) 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.

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.

Page		Dual Flight	Solo Flight	Dual Cross-Country	Solo Cross-Country	Dual Night	Ground Instruction
01	Stage 1						
03	Module 1	1.0					1.5
04	Module 2	1.0					1.0
05	Module 3	1.0					1.5
06	Module 4	1.0					1.5
07	Module 5	1.0					1.5
08	Module 6	1.0					1.5
09	Module 7	1.0					1.5
10	Module 8	1.0					1.5
11	Module 9	1.0					1.5
12	Module 10	1.0					1.0
13	Module 11	1.0					1.5
14	Module 12	1.0					1.5
15	Module 13	0.5	0.5				0.5
16	Module 14/ Stage Check	1.0					1.0
19	Stage 2						
20	Module 1		1.0				
21	Module 2	0.5					1.0
22	Module 3		1.0				
23	Module 4	1.0					2.0
24	Module 5		1.0				
25	Module 6	1.0					1.0
26	Module 7		1.0				
27	Module 8/ Stage Check	1.0					1.0
28	Stage 3						
29	Module 1	1.0				1.0	1.5
30	Module 2	1.5		1.5			2.0
31	Module 3	1.0					2.0
32	Module 4	1.5		1.5		1.5	1.0
34	Module 5		1.5		1.5		
35	Module 6		2.0		2.0		0.5
36	Module 7/ Stage Check	1.0					1.0
37	Stage 4						
38	Module 1	1.0				1.0	1.0
39	Module 2	1.0					0.5
40	Module 3	1.0					1.0
41	Module 4/ Stage Check	1.0					
	TOTALS	23 + 4 Stage Checks	8.0	3.0	3.5	3.5	35

Helicopter Enrollment Certificate

This is to certify that

Student Name

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

School and Certificate Number

Chief Instructor

Date of Enrollment

Helicopter 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 Helicopter
Certification Course** conducted by

School and Certificate Number

Chief Instructor

Date of Graduation

SFAR 73 – Instruction in Robinson Helicopters

SFAR 73 requires that specific training requirements be met for pilots of R22 and R44 helicopters.

1. Awareness training must be given by an endorsed instructor prior to manipulating the controls. The instruction must consist of:
 - Energy management
 - Mast bumping
 - Low rotor RPM (blade stall)
 - Low G hazards
 - Rotor RPM decay
2. Pilots with less than 200 hours (50 in the R22 or R44) must meet certain requirements before acting as Pilot in Command. See SFAR 73 and the endorsement provided on page 17. (Endorsement valid for 12 months.)

Training must include:

- 10 dual in same model Robinson
 - Enhanced training in autorotation procedures
 - Engine rotor RPM control without the use of the governor
 - Low rotor RPM recognition and recovery
 - Effects of low G maneuvers and proper recovery procedures
3. Specific requirements must be met within 90 days prior to solo flight (for non helicopter rated pilots). See SFAR 73 and the pre-solo endorsement for Robinson pilots on page 17.

Training must include:

- 20 hours dual in same model Robinson
- Enhanced training in autorotation procedures
- Engine rotor RPM control without the use of the governor
- Low rotor RPM recognition and recovery
- Effects of low G maneuvers and proper recovery procedures

Instructor’s note: Use the following endorsement when signing off students for awareness training:

I certify that _____ (*First name, MI, Last name*) has received the Awareness Training required by SFAR 73 2(a)(3) in a _____ (*model of Robinson*)

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

Stage 1

Introduction to Helicopter 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 and regulations
- Grading criteria
- Forces acting on a helicopter
- Stability and control
- Training helicopter (airframe, engine, systems, flight instruments)
- Basic flight maneuvers
- Flight information
- Basic weather theory
- Emergency and hazardous conditions
- Flight physiology
- Regulations



Flight Training

- Flight training process
- Training helicopter
- Preflight
- “Special Emphasis Areas” (per PTS)
- Taxiing
- Four basics of flight (straight and level, turns, climbs, descents)
- Hovering
- Autorotations
- Use of sectional
- Airspace
- Collision avoidance
- Emergencies
- Steep Turns

Completion Standards

Stage 1 is complete when the student is ready and endorsed for solo flight. 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

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



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 the atmosphere and the forces acting on a helicopter.

Content:

- ___ Review of course and objectives
- ___ School requirements, procedures, regulations
- ___ Grading criteria, expectations of student
- ___ Review objective of Stage 1
- ___ Atmosphere
 - ___ Atmospheric pressure
 - ___ Air temperature
 - ___ Combined effects
 - ___ Moisture content
 - ___ Standard atmosphere
 - ___ Pressure altitude
 - ___ Density altitude

The forces acting on a helicopter

- ___ Lift
 - ___ Definitions
 - ___ Lift formula
 - ___ Dynamic energy
 - ___ Center of pressure
 - ___ Aerodynamic center
- ___ Drag
 - ___ Drag formula
 - ___ Parasite drag
 - ___ Profile drag
 - ___ Form drag
 - ___ Skin friction
 - ___ Induced drag/methods to reduce
 - ___ Tip vortices
 - ___ Total drag curve
- ___ Lift/Drag ratio
 - ___ Best L/D ratio
 - ___ Factors influencing L/D ratio

Completion Standards:

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

Assignment:

Principles of Helicopter Flight, 2nd Edition, Chapters 2–5



Flight Training

Objective:

For the student to be introduced to and become familiar with preflight inspections, checklist operations, starting and taxi procedures and the function and use of the helicopter controls.

Content:

- ___ Preflight inspection and aircraft documents (certificates and documents, aircraft logbooks, helicopter servicing, aircraft manual)
- ___ Introduction to PTS and special emphasis areas
- ___ SFAR 73 training if applicable (see page 17)
- ___ Positive exchange of flight controls
- ___ Familiarization with helicopter
- ___ Starting the engine and rotor engagement
- ___ Checklists/system checks
- ___ Normal takeoff
- ___ Hovering
- ___ Hover taxi
- ___ Normal departure and climb
- ___ Effects of controls
- ___ Attitude and power changes—power, attitude and speed change
- ___ Normal approach to landing
- ___ Postflight procedures

Completion Standards:

This module is complete when the student can conduct the preflight with minimum assistance, properly use all checklists, start the helicopter, and operate the controls.

Recommended Reading:

FAA-8083-21A, Chapters 3–5

Stage 1 / **Module 1**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / Module 2

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



Ground Training

Objective:

To introduce the student to the aerodynamic principles of climbing, descending and turning a helicopter. Students will also get a review of basic physics in the reading.

Content:

- ___ Controls and their effects
- ___ Hover
 - ___ In and out of ground effect
 - ___ Factors in ground effect
 - ___ Over-controlling
- ___ Forward flight
 - ___ Basic aspects of horizontal flight
 - ___ Changing disc attitude
 - ___ Dissymmetry of lift
 - ___ Elimination of dissymmetry of lift
 - ___ Flapback
- ___ Designs that reduce flapping amplitude
- ___ Reverse flow
- ___ Translational lift
- ___ Transverse flow effect
- ___ Climbing
 - ___ Horsepower-available curve
 - ___ Rate of climb
 - ___ Angle of climb
 - ___ Effect of wind
- ___ Descending
 - ___ Angle of descent
 - ___ Effect of wind

Completion Standards:

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

Assignment:

Principles of Helicopter Flight, 2nd Edition, Chapters 1, 10, 11, 12, and 14



Flight Training

Objective:

To gain experience with hovering and improve basic operation of the controls. The student will also be introduced to collision avoidance procedure and be made aware of mast bumping conditions.

Content:

- ___ Preflight
- ___ Personal checklist—"IM SAFE"
- ___ Surface markings
- ___ Mast bumping
- ___ Takeoff and landing
- ___ Hovering
- ___ Hover Taxi
- ___ Shallow and medium banked turns
- ___ Scanning procedures
- ___ Normal approach and landing
- ___ Postflight procedures

Completion Standards:

This module is complete when the student has basic control of the aircraft in a hover and can maintain altitude within 300 feet, airspeed within 20 knots and heading within 20 degrees while performing the maneuvers of this module.

Recommended Reading:

FAA-H-8083-21A, Chapter 9 (1-10)

Stage 1 / **Module 2**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / Module 3

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



Ground Training

Objective:

For the student to gain an understanding of how helicopter systems function.

Content:

- ___ Engines
- ___ Fuel systems
- ___ Electrical systems
- ___ Hydraulics
- ___ Environmental systems
- ___ Anti-icing systems
- ___ Transmission
- ___ Main rotor gear box
- ___ Freewheeling unit
- ___ Drive shafts
- ___ Tail rotor gear box
- ___ Rotor brake
- ___ Clutch
- ___ Chip detectors
- ___ Swashplate
- ___ Rotor blades
- ___ Trim controls
- ___ Tail rotors
- ___ Vibrations
- ___ Control functions
- ___ Engine cooling
- ___ Dual tachometer instruments
- ___ Rotor stabilizing design systems

Completion Standards:

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

Assignment:

FAA-H-8083-21, Chapter 5
Principles of Helicopter Flight, 2nd Edition, Chapter 20



Flight Training

Objective:

For the student to become familiar with the local area and to practice the four basics of flight: straight and level, climbs, turns, and descents.

Content:

- ___ Use of sectional
- ___ Preflight
- ___ Land and hold short operations
- ___ Normal takeoff and departure
- ___ Hover taxi
- ___ Hovering
- ___ Four basics of flight: Level flight, climbing, descending and turning
- ___ Sideways and backward flight
- ___ Transitions—leaving the hover to achieve forward flight and returning to the hover from forward flight
- ___ Normal approach and landing
- ___ Traffic patterns
- ___ Postflight procedures

Completion Standards:

This module is complete when the student can maintain flight within 250 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 postflight operations and be oriented to the practice area and airport.

Recommended Reading:

FAA-H-8083-21A, Chapter 9 (11-20)

Stage 1 / **Module 3**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / Module 4



Ground Training

Objective:

For the student to gain an understanding of the aerodynamic forces that affect helicopter flight, particularly with respect to the tail rotor.

Content:

- ___ Aerodynamic forces
 - ___ Rotational forces
 - ___ Blade angle and angle of attack
 - ___ Induced flow
 - ___ Airflow caused by velocity
 - ___ Total rotor thrust
 - ___ Rotor drag
 - ___ Inflow angle
 - ___ Forces opposing weight
 - ___ Rotor thrust
- ___ Rotor blade airfoils
 - ___ Drag
 - ___ Stress
 - ___ Effect of local air velocity on blade design
 - ___ Blade tip speeds
 - ___ Blade design
- ___ Rotor drag
 - ___ Disc loading
 - ___ Changes in gross weight
 - ___ Changes in altitude
 - ___ Changes in configuration
 - ___ Ground effect
 - ___ Translational lift
- ___ The Anti-Torque rotor
 - ___ Anti-torque functions
 - ___ Effect of the wind
 - ___ Translating tendency
 - ___ Tail rotor flapping
 - ___ Tail rotor designs
 - ___ Methods of anti-torque control
 - ___ Tail rotor failure

Completion Standards:

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

Assignment:

Principles of Helicopter Flight, 2nd Edition, Chapters 6, 7, 8, and 9

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



Flight Training

Objective:

For the student to gain proficiency in handling crosswind conditions and practice forward and rearward hovering as well as hovering turns.

Content:

- ___ Obtaining weather
- ___ Preflight
- ___ Radio communication
- ___ Runway incursions
- ___ Servicing the helicopter
- ___ Ground safety
- ___ Normal and crosswind takeoffs and landings
- ___ Vertical takeoff and landings
- ___ Hovering
- ___ Steep turns—30 degrees
- ___ Transitions from the hover to hover at low altitude
- ___ Traffic patterns
- ___ Normal approach and landing
- ___ Postflight procedures

Completion Standards:

This module is complete when the student can maintain flight within 300 feet altitude, 20 degrees heading, 20 knots airspeed while performing the maneuvers listed in the content of this module. The student must also be familiar with orientation using the sectional.

Recommended Reading:

AIM, Chapter 4—Section 2

Stage 1 / **Module 4**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / Module 5

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



Ground Training

Objective:

For the student to increase his/her knowledge of the basic flight maneuvers and learn about the flight instruments.

Content:

- ___ Maneuvers and turning
 - ___ Rate of turn
 - ___ Radius of turn
 - ___ Rate and radius interaction
 - ___ The steep turn
 - ___ Effect of altitude on rate and radius of turn
 - ___ Effect of gross weight on rate and radius of turn
 - ___ Effect of wind on rate and radius of turn
 - ___ Effect of wind on Indicated airspeed and Translational lift
 - ___ Effect of slingloads
 - ___ Effect of slipping and skidding
 - ___ Pull out from a descent
- ___ Flight Instruments
 - ___ Pitot static instruments
 - ___ Altimeter
 - ___ VSI
 - ___ ASI
- ___ Gyro instruments
 - ___ Turn indicators
 - ___ Inclinator
 - ___ Attitude indicator
 - ___ Heading indicator
- ___ Compass

Completion Standards:

This lesson is complete when the student has successfully completed the assigned reading.

Assignment:

Principles of Helicopter Flight, 2nd Edition, Chapters 15 and 16



Flight Training

Objective:

To practice and gain proficiency with hovering maneuvers and ground reference maneuvers. Student will also be introduced to mast bumping and vortex ring state conditions.

Content:

- ___ Obtaining weather
- ___ Preflight
- ___ Normal takeoff and departure
- ___ Stationary hover
- ___ Square pattern in hover
- ___ Vertical takeoff and landings
- ___ Crosswind takeoff and climb
- ___ Crosswind approach
- ___ Traffic patterns
- ___ Vortex ring state
- ___ Postflight procedures

Completion Standards:

The student should be able to establish a hover and maintain a hovering altitude within 50 feet, keep lateral and forward movement within 50 feet and headings within 20 degrees.

Stage 1 / **Module 5**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / Module 6



Ground Training

Objective:

For the student to gain an understanding of the factors affecting helicopter performance. The student will also learn the effects of weight and balance and learn how to perform weight and balance computations.

Content:

- ___ Helicopter performance
- ___ Performance factors
 - ___ Altitude
 - ___ Pressure altitude
 - ___ Density altitude
 - ___ Moisture content of air
 - ___ Aircraft gross weight
 - ___ External stores
 - ___ The wind
- ___ Power check
- ___ Performance graphs
 - ___ Hover ceiling graph
 - ___ Takeoff distance over 50-foot obstacle
 - ___ Max gross weight for hovering
 - ___ Climb performance
 - ___ Range
 - ___ Endurance
- ___ Weight and balance
 - ___ Definitions
 - ___ Weight
 - ___ Balance
 - ___ Center of gravity limits
 - ___ Calculating center of gravity position
 - ___ Effect of external loads

Completion Standards:

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

Assignment:

Principles of Helicopter Flight, 2nd Edition, Chapters 25 and 26

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



Flight Training

Objective:

To introduce the student to low rotor rpm operations. The student will practice go-arounds as well as basic maneuvers.

Content:

- ___ Obtaining weather
- ___ Preflight
- ___ Discussion of cockpit management and ATC light signals
- ___ Vertical takeoff and landings
- ___ Crosswind takeoff to a hover
- ___ Normal and crosswind approach to a hover
- ___ Hovering/ground reference maneuvers
- ___ Recognition and recovery from low rotor rpm
 - ___ During cruise
 - ___ On takeoff
 - ___ At a hover
- ___ Normal approach and landing
- ___ Go-around
- ___ Traffic pattern operations
- ___ Postflight procedures

Completion Standards:

This module is complete when the student can maintain traffic pattern altitude within 200 feet, heading within 20 degrees, and airspeed within 15 knots. The student must also be knowledgeable in ATC light signals and cockpit management.

Stage 1 / **Module 6**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / Module 7

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



Ground Training

Objective:

For the student to gain an understanding of the hazardous flight conditions that affect helicopter flight.

Content:

- ___ Vortex ring state
 - ___ Development
 - ___ Lead up flight conditions
 - ___ Symptoms
 - ___ Recovery
 - ___ Tail rotor
- ___ Ground resonance
- ___ Causes of ground resonance
- ___ Factors—rotor head vibrations/fuselage
- ___ Recovery actions
- ___ Blade sailing
- ___ Dynamic rollover
- ___ Factors in critical angle
- ___ Cyclic limitations
- ___ Mast bumping
 - ___ Avoiding
 - ___ Recovery from low and zero G
- ___ Exceeding rotor rpm limits
- ___ Reasons for high rotor rpm limits
- ___ Reasons for low rotor rpm limits
- ___ Rotor stalls—recovery from low rotor rpm

Completion Standards:

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

Assignment:

Principles of Helicopter Flight, 2nd Edition, Chapter 19



Flight Training

Objective:

For the student to be introduced to maximum performance takeoffs and steep approaches as well as the conditions for dynamic rollover and low G situations. Operational interpretation of weather data will also be stressed.

Content:

- ___ Obtaining weather (Go/no go)
- ___ Preflight
- ___ Dynamic rollover
- ___ Low G conditions
- ___ Normal/crosswind takeoff and departure
- ___ Hover taxi
- ___ Vertical takeoff and landings
- ___ Ground reference maneuvers
- ___ Pattern work
- ___ Maximum performance takeoff
- ___ Steep approach
- ___ Normal/crosswind approach and landing
- ___ Postflight procedures

Completion Standards:

This module is complete when the student knows the correct procedure for maximum performance takeoffs and steep approaches. The student should be able to fly the pattern within 200 feet altitude, 20 degrees heading and 15 knots airspeed. The student must also be able to enter and depart a normal traffic pattern.

Stage 1 / **Module 7**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / Module 8



Ground Training

Objective:

For the student to become familiar with airports and airport operations—along with the tools available for obtaining flight information.

Content:

- ___ Airport operations
 - ___ Types of airports/heliports
 - ___ Sources for airport data
 - ___ Airport/heliport markings and signs
 - ___ Airport/heliport lighting
 - ___ Wind direction indicators
 - ___ Radio communication
 - ___ ATC services and radar
 - ___ Wake turbulence
 - ___ Collision avoidance
- ___ Flight information
 - ___ 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 the assigned reading.

Assignment:

FAA-H-8083-25, Chapter 12
AIM, Chapter 2—Section 3
A/FD

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



Flight Training

Objective:

For the student to become proficient with normal and crosswind takeoffs and landings, and to become familiar with wake turbulence procedures.

Content:

- ___ Obtaining weather
- ___ Preflight
- ___ Performance charts for takeoff
- ___ Airport/Heliport markings and signs
- ___ Air taxi
- ___ Surface taxi
- ___ Normal and crosswind takeoffs and approaches
- ___ Hovering
- ___ Pattern operations
- ___ Vertical takeoff and landings
- ___ Steep approaches
- ___ Emergency approaches
- ___ Wake turbulence procedures
- ___ 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. The student should have an understanding of when different taxi methods are used.

Stage 1 / **Module 8**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / Module 9

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



Ground Training

Objective:

For the student to gain an understanding of aviation charts, the airspace system and NTSB reporting requirements.

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
- ___ NTSB 830 (49 CFR Part 830)

Completion Standards:

This lesson is complete when the student has successfully completed the assigned reading.

Assignment:

AIM, Chapter 3; NTSB 830 (49 CFR Part 830)



Flight Training

Objective:

To introduce the student to straight-in autorotations. This lesson will also introduce control related malfunctions.

Content:

- ___ Obtaining weather
- ___ Preflight
- ___ Radio communications
- ___ Hover taxi
- ___ Vertical takeoffs and landings
- ___ Normal departure and approach
- ___ Hovering maneuvers
- ___ Straight-in autorotation with power recovery
- ___ Control malfunctions
 - ___ flight control/trim
 - ___ rotor and/or antitorque
 - ___ frequency vibrations and components that may be affected
- ___ Go-arounds
- ___ Traffic pattern operations
- ___ Postflight

Completion Standards:

This module is complete when the student can operate in all phases of flight within 200 feet altitude, 20 degrees heading, 15 knots airspeed.

Stage 1 / **Module 9**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / Module 10



Ground Training

Objective:

For the student to gain an understanding of the underlying principles of retreating blade stall and autorotation.

Content:

- ___ Retreating Blade Stall
 - ___ Effect of increasing airspeed on stall angle
 - ___ Factors affecting the advancing blade
 - ___ Symptoms of retreating blade stall
 - ___ Recovery
 - ___ Factors influencing V_{NE}
- ___ Autorotation
 - ___ Initial aircraft reaction
 - ___ Lift/Drag ratio and forces involved
 - ___ Autorotation and airspeed
 - ___ Autorotation range and endurance
 - ___ Touchdown
 - ___ Loss of power at low heights
 - ___ Rotor rpm decay when the engine fails
 - ___ Airspeeds and heights best avoided

Completion Standards:

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

Assignment:

Principles of Helicopter Flight, 2nd Edition, Chapters 17 and 18

Minimum 141 Requirements: Dual
1.0 hour flight,
1.0 hour ground instruction



Flight Training

Objective:

For the student to gain proficiency with emergency operations. The student will be introduced to techniques for settling with power and power failure at altitude. The student will also learn to perform rapid decelerations.

Content:

- ___ Obtaining weather
- ___ Preflight
- ___ Ground resonance
- ___ Wire strike avoidance
- ___ Surface taxi (wheels)
- ___ Air taxi
- ___ Normal takeoffs and approaches
- ___ Hovering patterns
- ___ Vertical takeoff and landings
- ___ Settling with power
- ___ Power failure at altitude
- ___ Straight-in autorotation with power recovery
- ___ Rapid deceleration
- ___ Go-arounds

Completion Standards:

This module is complete when the student is able to recognize the onset of settling with power and take appropriate action.

Stage 1 / **Module 10**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / Module 11

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



Ground Training

Objective:

To introduce the student to the Federal Aviation Regulations with emphasis on how the regulations are organized and how to find information. The instructor should also identify which parts are required for Private Pilot Rotorcraft knowledge.

Content:

- ___ FAR publication
- ___ 14 CFR Part 1
- ___ 14 CFR Part 61
- ___ 14 CFR Part 91

Completion Standards:

This lesson is complete when the student completes the quiz on regulations on Appendix Page 1-1 of this book.

Assignment:

14 CFR, Parts 61 and 91



Flight Training

Objective:

This lesson will focus on systems emergencies and equipment malfunctions. The student will also continue practicing previously learned emergency operations in preparation for solo flight.

Content:

- ___ Obtaining weather
- ___ Preflight
- ___ Vertical takeoffs and landings
- ___ Normal takeoff and climb
- ___ Normal approach
- ___ Straight-in autorotation with power recovery
- ___ Power failure at a hover
- ___ Partial power failure
- ___ Systems emergencies
 - ___ Engine/oil and fuel
 - ___ Power train failure
 - ___ Hydraulic, if applicable
 - ___ Electrical
 - ___ Carburetor or induction icing
 - ___ Smoke and/or fire
 - ___ Pitot static/vacuum and associated flight instruments, if applicable
 - ___ Abnormal vibrations
 - ___ Warning lights
- ___ Other emergencies specific to the training helicopter
- ___ Postflight

Completion Standards:

This module is complete when the student performs the correct emergency procedures for the items listed, exhibits basic troubleshooting knowledge and executes recovery actions as needed. Flight must be maintained within 200 feet, 15 degrees and 15 knots. Autorotation airspeed should be within 10 knots.

Stage 1 / **Module 11**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / **Module 12**



Ground Training

Objective:

For the student to gain an understanding of weather briefings, operational weather factors, and insight into making the go/no-go decision.

Content:

- ___ Weather theory
 - ___ Nature of the atmosphere
 - ___ The cause of atmospheric circulation
 - ___ Atmospheric stability
 - ___ Air masses
 - ___ Fronts
 - ___ Turbulence
 - ___ Windshear
 - ___ Thunderstorms
 - ___ Microbursts
 - ___ Obtaining a weather briefing
 - ___ METARs, TAFs
 - ___ Making the go/no-go decision

Completion Standards:

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

Assignment:

FAA-H-8083-25, Chapter 10

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



Flight Training

Objective:

For the student to review previously learned maneuvers with emphasis on weak areas. This module will prepare the student for solo flight.

Content:

- ___ Obtaining weather
- ___ Preflight inspection and aircraft documents
- ___ ATC light signals
- ___ Surface taxi
- ___ Hover taxi
- ___ Air taxi
- ___ Hovering patterns
- ___ Vertical takeoff and landing
- ___ Normal and crosswind takeoffs and landings
- ___ Traffic pattern
- ___ Go-arounds
- ___ Power failure at altitude
- ___ Power failure at a hover
- ___ Settling with power
- ___ Low rotor rpm recovery
- ___ Partial power failure
- ___ Postflight

Completion Standards:

This module is complete when the student is comfortable with all of the pre-solo maneuvers including emergencies and can conduct all with minimum assistance from the flight instructor. Flight must be maintained within 200 feet, 15 degrees and 15 knots.

Stage 1 / **Module 12**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / **Module 13**



Ground Training

Objective:

To conduct a pre-solo briefing and complete, grade and review the pre-solo exam.

Content:

- ___ Solo limitations
- ___ Club rules
- ___ Pre-solo exam

Completion Standards:

This lesson is complete when the student has passed the pre-solo exam with a minimum score of 80%, and reconciled to 100%.

Minimum 141 Requirements: Dual

- 0.5 hour flight,
- 0.5 hour solo,
- 0.5 hour ground instruction



Flight Training

Objective:

Prior to this module the student will have passed the pre-solo written test. The intent of this module is for the student to first conduct supervised solo flight and then to practice solo takeoffs and landings in the pattern.

Content:

Dual flight

- ___ Obtaining weather
- ___ Verify the requirements of SFAR 73 2(b)(3) have been met (if applicable)
- ___ Preflight
- ___ Vertical takeoffs and landings
- ___ Hover taxi
- ___ Air taxi
- ___ Normal and crosswind takeoffs and landings
- ___ Climbs and approaches
- ___ Go-around
- ___ Traffic pattern operations
- ___ Instructor endorsement

Supervised solo

- ___ Normal takeoff
- ___ Stationary hover
- ___ Hover taxi
- ___ Air taxi
- ___ Traffic pattern
- ___ Vertical takeoffs and landings
- ___ Climbs and approaches

Completion standards:

This module is complete when the student is signed off for solo work, and the student has successfully accomplished solo flight. Flight must be maintained within 150 feet, 15 degrees, 15 knots while performing the maneuvers listed in the content of this module.

Stage 1 / **Module 13**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 1 / **Module 14 and Stage Check**

Lesson Time: Dual 1.0 hour 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 chief flight instructor or designee to review the student's progress. If student performance is satisfactory, training can progress to stage 2 and solo operations away from the traffic pattern permitted.

Content:

- ___ Obtaining weather
- ___ Preflight inspection and aircraft documents
- ___ Cockpit management
- ___ Radio communication and ATC light signals
- ___ Pre-takeoff checks
- ___ Surface taxi
- ___ Hover taxi
- ___ Air taxi
- ___ Normal and crosswind takeoffs and landings
- ___ Straight and level flight; turns in both directions
- ___ Straight-in autorotation with power recovery
- ___ Climbs and climbing turns
- ___ Airport traffic patterns
- ___ Power failure
- ___ Settling with power
- ___ Low rotor rpm recovery
- ___ Rapid decelerations
- ___ Partial power failure
- ___ Collision avoidance, wake turbulence
- ___ Equipment malfunctions
- ___ Go-arounds
- ___ Postflight

Completion Standards:

This module is complete when the student can conduct the flight tasks competently enough to leave the pattern. Altitude should be within 150 feet, heading 15 degrees and airspeed 15 knots throughout maneuvering. During hover, altitude should be within 5 feet and ground track kept within 5 feet. Autorotation maneuvers should be stopped within 150 feet of a specified point.

Stage 1 / **Module 14**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage Exam Score: _____

Stage Check Successful: _____

1. Endorsement for pre-solo requirements in Robinson helicopters SFAR 73 2(b)(3) (valid for 90 days)

I certify that _____ (*First name, MI, Last name*) has satisfactorily met the experience or training requirements required by SFAR 73 2(b)(3). I have determined he/she has demonstrated the proficiency required by SFAR 73 2(b)(3) and is proficient to make solo flights in a _____ (*model of Robinson*).

[date] J. Jones 987654321 CFI [expiration date]

2. Endorsement for Pilot in Command in Robinson helicopters for pilots with less than 200 hours: SFAR 73 2(b)(1) or (2)

I certify that _____ (*First name, MI, Last name*) has satisfactorily met the experience or training requirements required by SFAR 73 2(b)(1) or (2). I have determined he/she has demonstrated the proficiency required by SFAR 73 2(b)(1 or (2)) and is proficient to act as Pilot in Command in a _____ (*model of Robinson*).

[date] J. Jones 987654321 CFI [expiration date]

3. 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 required by §61.87(b) for the _____ (*make and model aircraft*).

[date] J. Jones 987654321 CFI [expiration date]

4. 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 required by §61.87(d) and is proficient to make solo flights in _____ (*make and model aircraft*).

[date] J. Jones 987654321 CFI [expiration date]

5. Endorsement for solo flight (first 90 day period): 14 CFR 61.87 (n)(2)

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 section 61.87(n) and is proficient to make solo flights in a _____ (*make and model aircraft*).

[date] J. Jones 987654321 CFI [expiration date]

6. 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 987654321 CFI [expiration date]

7. 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 987654321 CFI [expiration date]

8. 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 training required by §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 987654321 CFI [expiration date]

Reminder: Instructor will need to endorse student pilot certificate.

Stage 2

Advanced Maneuvers and Solo Practice

Objective

In this stage the student begins building on the foundation of basic skills. Stage 2 flight training focuses on advanced maneuvers with some review of primary maneuvers as necessary.



Ground Training

- Flying for range and endurance
- Stability
- Weather reports and forecasts
- Flight Computer



Flight Training

- Maximum performance takeoffs and landings
- Advanced technique takeoffs and landings
- Emergency conditions

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. Students shall score at least 80% on the Stage 2 exam with all deficient areas reconciled to 100%.



Flight Training

Objective:

For the student to practice previously learned maneuvers in solo flight. The flight tasks listed represent options for the instructor to choose from in assigning maneuvers. These may vary depending upon weather, student proficiency or other factors. Instructors should review tasks that should not be practiced solo:

1. Autorotation
2. Simulated forced landings
3. Settling with power
4. Recovery from low rpm
5. Low G maneuvers

Content:

- ___ Vertical takeoffs to a hover
- ___ Hovering patterns
- ___ Stationary hover
- ___ Surface taxi
- ___ Hover taxi
- ___ Air taxi
- ___ Normal and crosswind takeoffs
- ___ Traffic patterns
- ___ Climbs and normal approaches
- ___ Go-around

Completion Standards:

This module is complete when the student has successfully completed the solo flight.

Stage 2 / **Module 1**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 2 / Module 2

Minimum 141 Requirements: Dual
0.5 hour flight,
1.0 hour ground instruction



Ground Training

Objective:

For the student to gain an understanding of the factors involved in flying for range and endurance. The student will also learn the elements of specialty takeoffs and landings and learn about sloped surface operations, sling loads and stability.

Content:

- ___ Power
- ___ Total horsepower required curve
- ___ Flying for range
- ___ Flying for endurance
- ___ Stability
- ___ Out-of-wind takeoffs and landings
- ___ Different types of takeoffs and landings
 - ___ Downwind takeoffs and landings
 - ___ Running takeoff
 - ___ Cushion-creep takeoff
 - ___ Confined area takeoff
 - ___ Maximum performance takeoff
 - ___ Running landing
 - ___ The zero speed landing
- ___ Operations on sloping surfaces
- ___ Sling operations

Completion Standards:

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

Assignment:

FAA-H-8083-21A, Chapter 13



Flight Training

Objective:

This lesson begins paving the way toward more demanding kinds of operations. The student is introduced to maximum performance takeoff and climbs, rolling and running takeoffs and shallow approaches with running/roll-on landings.

Content:

- ___ Preflight
- ___ Review of maneuvers as needed
- ___ Maximum performance takeoffs and climbs
- ___ Hovering autorotation
- ___ Steep approaches
- ___ Rolling and running takeoffs
- ___ Shallow approach and running/roll-on landings
- ___ Introduction to 180 degree autorotation
- ___ Postflight

Completion Standards:

This module is complete when the student understands the operational considerations for using maximum performance takeoffs and landings. The student should also have a solid understanding of the techniques used for these maneuvers.

Recommended reading:

FAA-H-8083-21A, Chapter 9 (1-9)

Stage 2 / **Module 2**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 2 / **Module 3** and **Solo**

Minimum 141 Requirements: 1.0 hour solo



Flight Training

Objective:

For the student to continue practicing Stage 1 maneuvers. The flight tasks listed represent options for the instructor to choose from in assigning the maneuvers. These may vary depending upon weather, student proficiency or other factors.

Content:

- ___ Preflight
- ___ Vertical takeoffs to a hover
- ___ Hovering patterns
- ___ Stationary hover
- ___ Surface taxi
- ___ Hover taxi
- ___ Air taxi
- ___ Normal and crosswind takeoffs
- ___ Traffic patterns
- ___ Climbs and normal approaches
- ___ Go around
- ___ Postflight

Completion Standards:

This module is complete when the student has successfully completed the solo flight.

Stage 2 / **Module 3**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 2 / Module 4

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



Ground Training

Objective:

For the student to learn how to interpret weather reports, forecasts and charts.

Content:

- ___ Observations
- ___ Service outlets
 - ___ FSS
 - ___ TIBS
 - ___ DUATS
 - ___ EFAS
 - ___ HIWAS
 - ___ TWEB
- ___ Weather briefings
- ___ Reports
 - ___ METARS
 - ___ PIREPS
 - ___ SD
- ___ Forecasts
 - ___ TAFs
 - ___ Area forecasts
 - ___ In-flight advisories
 - ___ AIRMET
 - ___ SIGMET
 - ___ WST
 - ___ FD
 - ___ Weather charts
 - ___ Surface analysis
 - ___ Weather depiction
 - ___ Radar summary
 - ___ Prognostic charts

Completion Standards:

This lesson is complete when the student has successfully completed the assigned reading.

Assignment:

FAA-H-8083-25, Chapter 11



Flight Training

Objective:

For the student to learn the elements of confined area operations. Proficiency will also be increased in maximum performance takeoffs and climbs as well as steep approaches.

Content:

- ___ Preflight
- ___ Rolling takeoff
- ___ Maximum performance takeoff and climb
- ___ Steep approaches
- ___ Confined area operations—approach and departure
- ___ High and low reconnaissance
- ___ Shallow approach and running/roll-on landing
- ___ Retreating blade stall—Discussion
- ___ Autorotations
- ___ Recognition and recovery from low rotor rpm
- ___ Partial power failure
- ___ Traffic pattern operations
- ___ Postflight

Completion Standards:

This module is complete when the student understands the elements and techniques for conducting rolling takeoffs. The student should also have an understanding of the factors involved in confined area operations, including high and low reconnaissance. During both maneuvers rpm should be kept within normal limits.

Recommended reading:

FAA-H-8083-21A, Chapter 11 (5-9)

Stage 2 / **Module 4**

Date of Completion: _____

Signature: _____

Time Flown: _____



Flight Training

Objective:

In this module the student will continue practicing instructor assigned maneuvers in addition to the advanced maneuvers listed. The flight tasks listed represent options for the instructor to choose from in assigning the maneuvers. These may vary depending upon weather, student proficiency or other factors.

Content:

- ___ Preflight
- ___ Vertical takeoffs to a hover
- ___ Hovering patterns
- ___ Hovering turns
- ___ Stationary hover
- ___ Surface taxi
- ___ Hover taxi
- ___ Air taxi
- ___ Normal and crosswind takeoffs
- ___ Traffic patterns
- ___ Climbs and normal approaches
- ___ Go-around
- ___ Postflight

Advanced maneuvers for practice:

- ___ Steep approaches
- ___ Rapid deceleration
- ___ Maximum performance takeoff and climb

Completion Standards:

This module is complete when the student has successfully completed the solo flight.

Stage 2 / **Module 5**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 2 / Module 6

Minimum 141 Requirements: Dual
1.0 hour flight,
1.0 hour ground instruction



Ground Training

Objective:

For the student to learn the functionality of the flight computer and practice solving time, speed, distance and fuel problems.

Content:

- ___ Introduction
- ___ Time, speed distance
- ___ Fuel consumption
- ___ Conversions
- ___ True airspeed and density altitude
- ___ Using the wind side
- ___ Sample problems

Completion Standards:

This lesson is complete when the student has successfully completed the sample problems in the flight computer manual.

Assignment:

The flight computer user manual



Flight Training

Objective:

For the student to learn about emergency operations such as dynamic rollover. An instructor discussion should cover the listed topics. The student will also be introduced to pinnacle/platform and slope operations and continue to practice advanced maneuvers.

Content:

- ___ Preflight
- ___ Normal takeoff to a hover
- ___ Hovering patterns
- ___ Emergency conditions—discussion
 - ___ Dynamic rollover
 - ___ Ground resonance
 - ___ Low G conditions
 - ___ Low rotor rpm
 - ___ Anti-torque system failure
- ___ Slope operations
- ___ Maximum performance takeoff and climb
- ___ Pinnacle/platform operations
- ___ Rapid deceleration
- ___ Steep approach
- ___ 180 degree autorotation
- ___ Postflight

Completion Standards:

This module is complete when the student understands the factors involved in slope operations. The transition from slope to stabilized hover should be smooth with heading control within 15 degrees. The student should also know the recovery procedure for each emergency situation.

Recommended reading:

FAA-H-8083-21A, Chapter 10 (9-12)

Stage 2 / **Module 6**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 2 / **Module 7 and Solo**

Minimum 141 Requirements: 1.0 hour solo



Flight Training

Objective:

For the student to practice new solo maneuvers along with what the instructor assigns. The flight tasks listed represent options for the instructor to choose from in assigning the maneuvers.

Content:

- ___ Preflight
- ___ Vertical takeoffs to a hover
- ___ Hovering patterns
- ___ Hovering turns
- ___ Stationary hover
- ___ Surface taxi
- ___ Hover taxi
- ___ Air taxi
- ___ Normal and crosswind takeoffs
- ___ Traffic patterns
- ___ Climbs and normal approaches
- ___ Go-around
- ___ Postflight

Advanced maneuvers:

- ___ Steep approaches
- ___ Rapid deceleration
- ___ Maximum performance takeoff and climb

Completion standards:

This module is complete when the student has successfully completed the solo flight.

Stage 2 / **Module 7**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 2 / Module 8 and Stage Check



Lesson Time: Dual 1.0 hour flight, or whatever is necessary to meet objective
1.0 hour ground instruction, or whatever is necessary to meet objective

Flight and Ground Training

Objective:

For the chief flight instructor or designee to review the student's progress. If student performance is satisfactory, training can progress to Stage 3 for cross-country training.

Content:

- ___ Preflight
- ___ Maximum performance takeoff and climb
- ___ Slope operations
- ___ Confined area operations
- ___ Pinnacle/platform operations
- ___ Collision avoidance
- ___ Rolling takeoff (wheels)
- ___ Running takeoff
- ___ Steep approach
- ___ 180 degree autorotation
- ___ Shallow approach and running/roll-on landing
- ___ Rapid deceleration
- ___ Emergencies
 - ___ Retreating blade stall
 - ___ Dynamic rollover
 - ___ Ground resonance
 - ___ Low G conditions
 - ___ Low rotor rpm and blade stall
- ___ Go-around
- ___ Postflight

Completion Standards:

This module is complete when the student performs the maneuvers using proper procedures. Straight and level maneuvering altitude should be kept within 150 feet, heading 10 degrees and airspeed 10 knots. During hover, altitude should be kept within 5 feet and ground track kept within 5 feet. The student should have a complete understanding of the listed emergency tasks and their recovery procedures.

Stage 2 / **Module 8**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage Exam Score: _____

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

- Aeromedical factors
- Night flying
- Flight planning
- Radio navigation: VOR, ADF, radar, transponder, DME, RNAV
- 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

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



Ground Training

Objective:

For the student to learn about aeromedical factors as well as the elements involved in night flying.

Content:

- ___ Aeromedical factors
 - ___ Medical certificates
 - ___ Health factors
 - ___ Hypoxia
 - ___ Hyperventilation
 - ___ Middle ear and sinus problems
 - ___ Spatial disorientation/illusions
 - ___ Motion sickness
 - ___ Carbon monoxide
 - ___ Stress and fatigue
 - ___ Dehydration
 - ___ Alcohol/drugs
 - ___ Scuba diving
 - ___ Vision
- ___ Night operations
 - ___ Controlled flight into terrain
 - ___ Physiology
 - ___ Vision
 - ___ Aircraft lighting
 - ___ Visual illusions
 - ___ Autokinesis
 - ___ Night myopia
 - ___ False horizon
 - ___ Landing illusions
 - ___ Night flight

Completion Standards:

This lesson is complete when the student has completed the assigned reading.

Assignment:

FAA-H-8083-25, Chapter 15
FAA-H-8083-21A, Chapter 13



Flight Training

Objective:

For the student to learn about the elements involved in night flying and to gain experience with night operations.

Content:

- ___ Weather briefing
- ___ Night physiology
- ___ Night preflight inspection
- ___ Lighting and equipment
- ___ Use of charts/obstructions and minimum altitudes
- ___ Normal and crosswind takeoffs and approaches
- ___ Vertical takeoffs and landings
- ___ Hovering maneuvers
- ___ Postflight

Completion Standards:

This module is complete when the student understands the considerations affecting night operations and has gained experience flying at night.

Stage 3 / **Module 1**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 3 / Module 2



Ground Training

Objective:

To introduce the student to the tools and concepts used in planning for cross-country flight.

Content:

- ___ Charts
- ___ Time zones
- ___ Variation
- ___ Deviation
- ___ Effect of wind
- ___ Calculations—time, speed, distance
- ___ Computers and plotters
- ___ Pilotage
- ___ Dead reckoning
- ___ Wind vectors
- ___ Flight planning
 - ___ Publications including POH
 - ___ Plotting a course
 - ___ Flight log
 - ___ Flight plans

Completion Standards:

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

Assignment:

FAA-H-8083-25, Chapter 14

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



Flight Training

Objective:

For the student to learn the concepts of cross-country flying. Because there is a lot of new material, instructors may choose to conduct a 1 hour non-flying lesson to cover the necessary background information. This information is contained under the topic “cross-country discussion.” In this lesson the student will become familiar with navigating by means of pilotage and dead reckoning.

Content:

- ___ Weight and balance
- ___ Emergency equipment and survival gear
- ___ Cross-country discussion
 - ___ Flight publications
 - ___ NOTAMs
 - ___ Flight Service
 - ___ Flight following and radar services
 - ___ Two way communications
 - ___ Airspace system
 - ___ Plotting course
 - ___ Flight log
 - ___ Weather
 - ___ Filing flight plan
 - ___ Flight computer
- ___ Preflight
- ___ Cross-country flight
- ___ Performance charts
- ___ Use of flight log
- ___ Flight plan
- ___ Pilotage
- ___ Dead reckoning with use of compass
- ___ Traffic pattern procedures including arrival, departure and approach
- ___ Collision avoidance
- ___ Emergency procedures
- ___ Postflight

Completion Standards:

This module is complete when the student is able to satisfactorily complete the pre-flight planning for cross-country flight. The student should show competent weather analysis and be able to fly a pre-planned route using pilotage and dead reckoning. Altitude should be within 250 feet, heading within 15 degrees.

Stage 3 / **Module 2**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 3 / Module 3

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



Ground Training

Objective:

For the student to gain a practical understanding of radio navigation using the VOR, ADF, DME, Transponder and GPS.

Content:

Navigation aids

- VOR
- VOR/DME, TACAN and VORTAC
 - Course deviation indicator
 - TO/FROM arrow
 - VOR receiver check
 - Orientation
 - Course intercept
 - Tracking
- NDB and ADF
 - ADF and heading indicator
 - NDB range, accuracy, identification
 - ADF control panel
 - ADF relative bearing indicator (RBI)
 - ADF radio magnetic indicator
 - Orientation
 - Course intercept
 - Tracking
- Radar
- Transponder
- DME
- GPS
- VHF Direction Finding

Completion Standards:

This lesson is complete when the student has successfully completed the assigned reading.

Assignment:

FAA-H-8083-25, Chapter 14



Flight Training

Objective:

For the student to understand the principles of radio navigation using VOR, ADF and/or GPS. The student will also learn how to divert from a flight plan and how to proceed after becoming lost.

Content:

- Preflight
- VOR exercises:
 - Plotting a course using VOR radials
 - VOR radio operation including signal loss
 - VOR intercept and tracking drills including station passage
- ADF exercises:
 - Principle of bearings and ADF display
 - Operating the ADF
 - ADF homing drills
- GPS
 - Locating position
 - Lost procedures and radar services
 - Pilotage
 - Diversion procedures
 - Alternate selection
 - Estimate of heading, groundspeed, ETA and fuel
- Postflight

Completion Standards:

This module is complete when the student understands the principles of radio navigation. 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 250 feet, heading within 15 degrees.

Stage 3 / **Module 3**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 3 / Module 4



Ground Training

Objective:

For the student to gain a practical understanding of the principles involved in enroute navigation.

Content:

Enroute navigation

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

Completion Standards:

This lesson is complete when the student has successfully completed the assigned reading.

Assignment:

FAA-H-8083-25, Chapter 14

Minimum 141 Requirements: Dual cross-country
1.5 hours flight,
1.0 hour ground instruction



Flight Training

Objective:

To introduce the student to cross-country operations at night. In this module instructors may want to consider taking students through more diverse airspace than they are already familiar with. Flight must be over 50 NM.

Content:

- ___ Weather analysis including estimation of in-flight visibility
- ___ Flight publications
- ___ Use of aircraft performance charts pertaining to cross-country flight
- ___ Recognition/avoidance of hazardous terrain
- ___ Servicing helicopter away from home base
- ___ Preflight
- ___ Navigation
 - ___ Pilotage
 - ___ Dead reckoning
 - ___ Radio navigation
- ___ Night cross-country operations
 - ___ CFIT/planning
 - ___ Physiological factors
 - ___ Lighting and equipment
 - ___ Cockpit management
 - ___ Emergencies
- ___ Diversion to alternate
- ___ Steep approach
- ___ Rolling takeoff (wheels)
- ___ Running takeoff
- ___ Shallow approach and running/roll-on landing
- ___ Go-around
- ___ Postflight

Completion Standards:

This module is complete when the student is competent to fly solo cross-country. The student should be able to accurately interpret weather information, plan a trip and fly as planned. Altitude should be within 200 feet, heading 15 degrees. Arrival at checkpoints should be within 5 minutes of estimate and helicopter's position verified within 3 nautical miles of planned route. Differences in planning for fuel, heading and groundspeed should be recorded and corrected for.

Stage 3 / **Module 4**

Date of Completion: _____

Signature: _____

Time Flown: _____

1. Endorsement for initial solo cross-country flight: 14CFR §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 section 61.93, and is proficient to make solo cross-country flights in a _____ (*make and model aircraft*)

[date] J. Jones 987654321 CFI [expiration date]

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 987654321 CFI [expiration date]

Stage 3 / **Module 5** and **Solo X/C**

Minimum 141 Requirements: Solo cross-country
1.5 hours flight



Flight Training

Objective:

For the student to gain the required experience in solo cross-country operations. Flight must be at least 50 NM.

Content:

- ___ Cross-country planning
- ___ Instructor endorsement
- ___ Preflight
- ___ Radio navigation
- ___ Pilotage
- ___ Dead reckoning
- ___ Flight log 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 within 200 feet, 15 degrees, and 10 knots, at all times. Cross-country should be flown within 3 NM of the planned route. Arrival at enroute checkpoints should be within 5 minutes of the initial or revised ETA.

Stage 3 / **Module 5**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 3 / Module 6 and Solo X/C



Ground Training

Objective:

To complete the Stage 3 exam and review missed questions upon completion.

Content:

___ Stage 3 exam

Completion Standards:

Stage 3 exam must be passed with a minimum score of 80% and reconciled to 100%.

Minimum 141 Requirements: Cross-country
2.0 hours flight,
0.5 hour ground instruction



Flight Training

Objective:

For the student to gain the required experience for the solo long cross-country. Flight must be at least 100 NM with landings at a minimum of three points and one segment of the flight must be more than 25 NM between takeoff and landing locations.

Content:

- ___ Cross-country planning
- ___ Instructor endorsement
- ___ Preflight
- ___ Radio navigation
- ___ Pilotage
- ___ Dead reckoning
- ___ Flight log kept throughout flight
- ___ At least one landing more than 25 NM from between takeoff and landing locations
- ___ Postflight

Completion Standards:

This module is complete when the student has completed the cross-country flight.

Stage 3 / **Module 6**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 3 / **Module 7 and Stage Check**

Instructor's note:

At the discretion of the Chief Flight Instructor, the Stage 3 check can be combined with the Stage 4 check.

Lesson Time: Dual 1.0 hour flight, or whatever is necessary to meet objective
1.0 hour ground instruction, or whatever is necessary to meet objective



Flight Training

Objective:

To review the student's ability to adequately prepare for and fly cross-country. The evaluation should include the student's ability to properly divert to an alternate as well as handle in-flight emergencies.

Content:

- ___ Cross-country planning
 - ___ Publications
 - ___ Performance
 - ___ Weather information and analysis
 - ___ Plotting course/use of charts
 - ___ Flight log
 - ___ Filing flight plan
 - ___ Flight computer
 - ___ Weight and balance
- ___ Preflight
- ___ Cockpit management
- ___ Aeronautical decision making
- ___ Cross-country flight
 - ___ Departure
 - ___ Flight log use
 - ___ Navigation
 - ___ Radio communications
 - ___ Postflight
- ___ Emergencies including lost communication
- ___ Diversion procedures
- ___ Lost procedures
- ___ Collision avoidance
- ___ Postflight

Completion Standards:

This module is complete when the student has Private Pilot proficiency at cross-country operations. Flight must be within 200 feet, 15 degrees, and 10 knots at all times. Flight must be within 5 minutes of ETA and 3 NM of route throughout.

Stage 3 / Module 7
Date of Completion: _____
Signature: _____
Time Flown: _____
Stage Exam Score: _____
Stage Check Successful: _____

Stage 4

Preparation for Checkride

Objective

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



Ground Training

- Aeronautical decision making
- Mountain flying
- Helicopter icing
- 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 Rotorcraft 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—Rotorcraft. 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 learn the elements of aeronautical decision making and to gain the knowledge necessary for mountain flying.

Content:

___ ADM

- ___ The decision making process
- ___ Risk management
- ___ Factors affecting decision making
- ___ Hazardous attitudes
- ___ Stress management
- ___ Use of resources
- ___ Workload
- ___ Situational awareness
- ___ Operational pitfalls

___ Mountain flying

- ___ Updrafts and downdrafts
- ___ Thermal currents
- ___ Katabatic and anabatic winds
- ___ Mechanical turbulence
- ___ Valley flying
- ___ Ridgeline flying
- ___ The standard mountain approach
- ___ General comments on mountain approaches
- ___ Survival equipment
- ___ Areas covered by snow and ice

Completion Standards:

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

Assignment:

FAA-H-8083-21A, Chapter 14

Principles of Helicopter Flight, 2nd Edition, Chapter 23

Minimum 141 Requirements:

- Dual
- 1.0 hour flight (night),
- 1.0 hour ground instruction



Flight Training

Objective:

To practice flight maneuvers in preparation for the practical test. Night landings that were not accomplished in Module 3 should be conducted in this module.

Content:

- ___ Certificates and documents
- ___ Aircraft logbooks
- ___ ATC light gun signals
- ___ Minimum equipment list
- ___ Emergency equipment and survival gear
- ___ Preflight
- ___ Normal and crosswind takeoffs
- ___ Traffic patterns
- ___ Hovering maneuvers
 - ___ Forward, rearward, sideward hovering
 - ___ Hovering turns
 - ___ Surface taxi
 - ___ Hover taxi
 - ___ Air taxi
- ___ Rapid deceleration
- ___ Postflight

Completion Standards:

This module is complete when the student can perform all the maneuvers to PTS standards. At the conclusion of this module night landings should total 10.

Stage 4 / **Module 1**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 4 / Module 2

Minimum 141 Requirements: Dual
1.0 hour flight,
0.5 hour ground instruction



Ground Training

Objective:

For the student to gain an understanding of the elements involved in helicopter icing and for the student to take the FAA Knowledge Exam.

Content:

- ___ Helicopter Icing
 - ___ Ice accretion
 - ___ Ice formation at different temperatures
 - ___ Electrical anti-icing
 - ___ Consequences of ice accretion
 - ___ Engine intake icing

Completion Standards:

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

Assignment:

Principles of Helicopter Flight, 2nd Edition, Chapter 24
Take FAA Private Pilot Rotorcraft Knowledge Exam



Flight Training

Objective:

To practice flight maneuvers in preparation for the practical test.

Content:

- ___ Discussion elements
 - ___ Dynamic rollover
 - ___ Ground resonance
 - ___ Low G conditions
 - ___ Anti-torque system failure
- ___ Preflight
- ___ Review of weak areas
- ___ Hovering maneuvers
- ___ Rapid deceleration
- ___ Normal and crosswind approaches
- ___ Steep approaches
- ___ Autorotations
 - ___ Straight-in
 - ___ 180 degree
 - ___ From a hover
- ___ System and equipment malfunctions
- ___ Postflight

Completion Standards:

This module is complete when the student can perform all the maneuvers to PTS standards.

Stage 4 / **Module 2**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 4 / **Module 3**



Ground Training

Objective:

To prepare the student for the Practical Test

Content:

- ___ Review the Private Practical Test Standards (PTS)
- ___ Review the maintenance logs and required inspections
- ___ Review pilot's logbook (identify training requirements if desired)
- ___ Review missed questions from FAA Knowledge Exam

Completion Standards:

This lesson is complete when student is prepared for the end of course check and is familiar with the PTS requirements for required maneuvers.

Assignment:

Review the Private Practical Test Standards (PTS)

Minimum 141 Requirements: Dual
1.0 hour flight,
1.0 hour ground instruction



Flight Training

Objective:

To practice flight maneuvers in preparation for the Practical Test.

Content:

- ___ Preflight
- ___ Review of weak areas
- ___ Maximum performance takeoff and climb
- ___ Vertical takeoff and landing
- ___ Straight-in autorotation with power recovery
- ___ Hovering maneuvers
- ___ 180 degree autorotation
- ___ Power failure at a hover
- ___ Power failure at altitude
- ___ Systems and equipment malfunctions
- ___ Settling with power
- ___ Low rotor rpm recovery
- ___ Slope operations
- ___ Confined area operations
- ___ Pinnacle/platform operations
- ___ Rolling takeoff (wheels)
- ___ Running takeoff
- ___ Shallow approach and running/roll-on landing
- ___ Postflight

Completion Standards:

This module is complete when the student can perform all the listed maneuvers to Practical Test Standards.

Stage 4 / **Module 3**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage 4 / Module 4 and End of Course Check

Objective:

To review the applicant's readiness for the practical test. If the student shows weakness in some areas, additional instruction will be assigned as needed.

Content:

- ___ Certificates and documents
- ___ Aircraft logbooks
- ___ ATC light gun signals
- ___ Minimum equipment list
- ___ Emergency equipment and survival gear
- ___ Preflight
- ___ Cross-country operations
- ___ Engine starting and rotor engagement
- ___ Runway incursions
- ___ Normal and crosswind takeoffs
- ___ Traffic patterns
- ___ Hovering maneuvers
 - ___ Forward, rearward, sideward hovering
 - ___ Hovering turns
 - ___ Surface taxi
 - ___ Hover taxi
 - ___ Air taxi
- ___ Rapid deceleration
- ___ Dynamic rollover
- ___ Ground resonance
- ___ Low G conditions
- ___ Normal and crosswind approaches
- ___ Steep approaches
- ___ Maximum performance takeoff and climb
- ___ Vertical takeoff and landing
- ___ Straight-in autorotation with power recovery
- ___ 180 degree autorotation
- ___ Power failure at a hover
- ___ Power failure at altitude
- ___ Systems and equipment malfunctions
- ___ Settling with power
- ___ Low rotor rpm recovery
- ___ Slope operations
- ___ Confined area operations
- ___ Pinnacle/platform operations
- ___ Rolling takeoff (wheels)
- ___ Running takeoff
- ___ Shallow approach and running/roll-on landing
- ___ Postflight

Completion Standards:

This module is complete when the student performs all maneuvers to practical test standards (preferable better) and both instructors agree that the student is ready for the practical test.

Minimum 141 Requirements: Dual 1.0 hour flight, or whatever is necessary to meet objective
1.0 hour ground instruction, or whatever is necessary to meet objective

Assignment:

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

Stage 4 / **Module 4**

Date of Completion: _____

Signature: _____

Time Flown: _____

Stage Exam Score: _____

Stage Check Successful: _____

Private Pilot Endorsements

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

1. Aeronautical knowledge test: section 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 section 61.105. I have determined he/she is prepared for the Private Pilot Rotorcraft knowledge test.

[date] J. Jones 987654321 CFI [expiration date]

2. Flight proficiency/practical test: section 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 section 61.107 and §61.109. I have determined he/she is prepared for the Private Pilot Rotorcraft Practical Test.

[date] J. Jones 987654321 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
- Aircraft logbooks
- Materials necessary for planning a cross-country flight
- FAA Knowledge Exam results
- Identification with photo and signature
- Instructor endorsements for checkride
- Graduation certificate
- Examiner's fee
- Current Medical



U.S. Department
of Transportation
**Federal Aviation
Administration**

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 airman 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 or 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 blocks(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 shown 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.
2. 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.

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			
<input type="checkbox"/> Student Pilot Certificate Issued (Copy attached) <input type="checkbox"/> 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. <input type="checkbox"/> I have personally reviewed this applicant's graduation certificate, and found it to be appropriate and in order, and have returned the certificate. <input type="checkbox"/> I have personally tested and/or verified this applicant in accordance with pertinent procedures and standards with the result indicated below. <input type="checkbox"/> Approved -- Temporary Certificate Issued (Original Attached) <input type="checkbox"/> Disapproved -- Disapproval Notice Issued (Original Attached)			
Location of Test (Facility, City, State)		Duration of Test	
		Ground	Simulator/FTD
		Flight	
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	<input type="checkbox"/>	<input type="checkbox"/>	_____
Approved Simulator/Training Device Check	<input type="checkbox"/>	<input type="checkbox"/>	_____
Aircraft Flight Check	<input type="checkbox"/>	<input type="checkbox"/>	_____
Advanced Qualification Program	<input type="checkbox"/>	<input type="checkbox"/>	_____
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 or necessary requirements with the result indicated below.			
<input type="checkbox"/> Approved -- Temporary Certificate Issued (Original Attached)		<input type="checkbox"/> Disapproved -- Disapproval Notice Issued (Original Attached)	
Location of Test (Facility, City, State)		Duration of Test	
		Ground	Simulator/FTD
		Flight	
Certificate or Rating for Which Tested		Type(s) of Aircraft Used	Registration No.(s)
<input type="checkbox"/> Student Pilot Certificate Issued <input type="checkbox"/> Examiner's Recommendation <input type="checkbox"/> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/> Reissue or Exchange of Pilot Certificate <input type="checkbox"/> Special Medical test conducted -- report forwarded to Aeromedical Certification Branch, AAM-330			
<input type="checkbox"/> Certificate or Rating Based on <input type="checkbox"/> Military Competence <input type="checkbox"/> Foreign License <input type="checkbox"/> Approved Course Graduate <input type="checkbox"/> Other Approved FAA Qualification Criteria			
<input type="checkbox"/> Flight Instructor <input type="checkbox"/> Ground Instructor <input type="checkbox"/> Renewal <input type="checkbox"/> Reinstatement <input type="checkbox"/> Instructor Renewal Based on <input type="checkbox"/> Activity <input type="checkbox"/> Training Course <input type="checkbox"/> Test <input type="checkbox"/> Duties and Responsibilities			
Training Course (FIRC) Name		Graduation Certificate No.	Date
Date	Inspector's Signature (Print Name & Sign)	Certificate No.	FAA District Office
Attachments: <input type="checkbox"/> Airman's Identification (ID)			
<input type="checkbox"/> Student Pilot Certificate (Copy)	Form of ID _____	ID: _____	Name: _____
<input type="checkbox"/> Knowledge Test Report	Number _____	Date of Birth: _____	
<input type="checkbox"/> Temporary Airman Certificate	Expiration Date _____	Certificate Number: _____	
<input type="checkbox"/> Notice of Disapproval	Telephone Number _____	E-Mail Address _____	
<input type="checkbox"/> Superseded Airman Certificate			

Stage 1 / **Module 11 Quiz**

Regulations

Name: _____

Grade: _____ **Date:** _____

Instructor: _____

- 1.** The definition of nighttime is
 - A—sunset to sunrise.
 - B—one hour after sunset to one hour before sunrise.
 - C—the time between the end of evening civil twilight and the beginning of morning civil twilight.

- 2.** A Third-Class Medical Certificate is issued to a 36-year-old pilot on August 10, this year. To exercise the privileges of a Private Pilot Certificate, the medical certificate will be valid until midnight on
 - A—August 10, 2 years later.
 - B—August 31, 3 years later.
 - C—August 31, 2 years later.

- 3.** Under what conditions may objects be dropped from an aircraft?
 - A—Only in an emergency.
 - B—If precautions are taken to avoid injury or damage to persons or property on the surface.
 - C—If prior permission is received from the Federal Aviation Administration.

- 4.** Where may an aircraft's operating limitations be found?
 - A—On the airworthiness certificate.
 - B—In the current FAA approved flight manual, approved manual material, markings and placards, or combination thereof.
 - C—In the aircraft engine and airframe logbooks.

- 5.** Which preflight action is specifically required of the pilot prior to each flight?
 - A—Check the aircraft logbooks for appropriate entries.
 - B—Become familiar with all available information concerning the flight.
 - C—Review wake turbulence procedures.

- 6.** With certain exceptions, safety belts are required to be secured about passengers during
 - A—taxi, takeoff and landings.
 - B—all flight conditions.
 - C—flight in turbulent air.

- 7.** What exception, if any, permits a private pilot to act as pilot in command of an aircraft carrying passengers who pay for the flight?
 - A—If the passengers pay all the operating expenses.
 - B—If a donation is made to a charitable organization for the flight.
 - C—There is no exception.

- 8.** No person may begin a flight in a rotorcraft under VFR unless there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, to fly thereafter for at least
 - A—20 minutes.
 - B—30 minutes.
 - C—1 hour.

- 9.** During operations within controlled airspace at altitudes of less than 1,200 feet AGL, the minimum horizontal distance from clouds requirement for VFR flight is
 - A—1,000 feet.
 - B—2,000 feet.
 - C—1,500 feet.

- 10.** What ATC facility should the pilot contact to receive a special VFR departure clearance in Class D airspace?
 - A—Automated Flight Service Station.
 - B—Air Traffic Control Tower.
 - C—Air Route Traffic Control Center.

Stage 1 Exam

Pre-Solo Written

Name: _____

Grade: _____ Date: _____

Instructor: _____

Choose 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. 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.
3. The angle between the chord line of an airfoil and the relative wind is known as the angle of _____.
 - A—lift.
 - B—attack.
 - C—incidence.
4. What is ground effect?
 - A—The result of interference of the Earth with airflow patterns around the helicopter.
 - B—The result of alteration of airflow patterns increasing induced drag around the rotor blades.
 - C—The result of disruption of airflow patterns about the blades of a rotor to the point where the rotor no longer supports the weight of the helicopter in flight.
5. The wind condition that requires maximum caution when avoiding wake turbulence on landing is a _____.
 - A—light, quartering headwind.
 - B—light, quartering tailwind.
 - C—strong headwind.
6. The altitude deviation allowed by the PTS for operations in the pattern is _____.
 - A—100 ft.
 - B—150 ft.
 - C—200 ft.
7. Which is appropriate for a helicopter approaching an airport for landing?
 - A—Remain below the airplane traffic pattern.
 - B—Avoid the flow of fixed wing traffic.
 - C—Fly right hand traffic.
8. Which is the correct traffic pattern departure procedure to use at a noncontrolled airport?
 - A—Depart in any direction consistent with safety after crossing the airport boundary.
 - B—Make all turns to the left.
 - C—Comply with the FAA traffic pattern procedures for the airport.
9. When the speed of a helicopter increases from 20 knots to 60 knots, parasite drag increases by a factor of _____.
 - A—three.
 - B—six.
 - C—nine.
10. 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.

- 11.** 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.
- 12.** 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.
- 13.** 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.
- 14.** Information concerning parachute jumping sites may be found in the _____
- A—NOTAMs.
 B—Airport/Facility directory.
 C—graphic notices and supplementary data.
- 15.** Most midair collision accidents occur during
- A—hazy days.
 B—clear days.
 C—cloudy nights.
- 16.** Students must uphold at all times
- A—FAA regulations.
 B—school requirements and procedures.
 C—both A and B.
- 17.** The four forces acting on a helicopter in flight are
- A—lift, weight, thrust, and drag.
 B—lift, weight, gravity, and thrust.
 C—lift, gravity, power, and friction.
- 18.** 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.
- 19.** 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.
- 20.** During forward cruising flight at constant airspeed and altitude, the individual rotor blades, when compared to each other, are operating
- A—with increasing lift on the retreating blade.
 B—with decreasing angle of attack on the advancing blade.
 C—at unequal airspeed, unequal angles of attack and equal lift moment.
- 21.** Name the four strokes of a piston engine:
- A—Intake, induction, power, expansion.
 B—Intake, compression, power, exhaust.
 C—Intake, compression, power, expansion.
- 22.** 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.
- 23.** Clouds, fog, or dew will always form when
- A—water vapor condenses.
 B—water vapor is present.
 C—relative humidity reaches 100%.

-
- 24.** 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.
- 25.** 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.
- 26.** The lift differential that exists between the advancing main rotor blade and the retreating main rotor blade is known as
- A—transverse flow effect.
 - B—dissymmetry of lift.
 - C—hunting tendency.
- 27.** 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.
- 28.** 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.
- 29.** 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.
- 30.** 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.
- 31.** 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.
- 32.** 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.
- 33.** 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.
- 34.** 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.

- 35.** 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.
- 36.** 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.
- 37.** Student pilots are responsible for all information, rules, and regulations in Parts
- A—61, and 91.
 - B—91, and 121.
 - C—1, and 67.

- 38.** 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.

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

	Grade	Capacity
Fuel	_____	_____
Oil	_____	_____

- 40.** What do each of the following ATC light signals mean?

	in flight	on the ground
Steady green	_____	_____
Flashing green	_____	_____
Steady red	_____	_____
Flashing red	_____	_____
Flashing white	_____	_____
Alternating red and green	_____	_____

Stage 2 Exam

Advanced Maneuvers

Name: _____

Grade: _____ Date: _____

Instructor: _____

1. The purpose of the lead-lag (drag) hinge in a three-bladed, fully articulated helicopter rotor system is to compensate for
 - A—Coriolis effect.
 - B—coning.
 - C—geometric unbalance.
2. High airspeeds, particularly in turbulent air, should be avoided primarily because of the possibility of
 - A—an abrupt pitch up.
 - B—retreating blade stall.
 - C—a low frequency vibration developing.
3. The maximum forward speed of a helicopter is limited by
 - A—retreating blade stall.
 - B—rotor RPM red line.
 - C—solidity ration.
4. Ground resonance is most likely to develop when
 - A—on the ground and harmonic vibrations develop between the main and tail rotors.
 - B—a series of shocks causes the rotor system to become unbalanced.
 - C—there is a combination of a decrease in the angle of attack on the advancing blade and an increase in the angle of attack on the retreating blade.
5. If the pilot experiences ground resonance, and the rotor RPM is not sufficient for flight,
 - A—open the throttle full and liftoff.
 - B—apply the rotor brake and stop the rotor as soon as possible.
 - C—attempt to takeoff at that power setting.
6. If the pilot were to make a near-vertical power approach into a confined area with the airspeed near zero, what hazardous condition may develop?
 - A—Ground resonance when ground contact is made.
 - B—A settling-with-power condition.
 - C—Blade stall vibration could develop.
7. If anti-torque failure occurred during the landing touchdown, what could be done to help straighten out a left yaw prior to touchdown?
 - A—A flare to zero airspeed and vertical descent to touchdown should be made.
 - B—Apply available throttle to help swing the nose to the right just prior to touchdown.
 - C—A normal running landing should be made.
8. The upward bending of the rotor blades resulting from the combined forces of lift and centrifugal force is known as:
 - A—coning.
 - B—blade slapping.
 - C—inertia.
9. Which is a precaution to be observed during an autorotative descent?
 - A—Normally, the airspeed is controlled with the collective pitch.
 - B—Normally, only the cyclic control is used to make turns.
 - C—Do not allow the rate of descent to get too low at zero airspeed.
10. What is the procedure for a slope landing?
 - A—When the downslope skid is on the ground, hold the collective pitch at the same position.
 - B—Minimum rpm shall be held until the full weight of the helicopter is on the skid.
 - C—When parallel to the slope, slowly lower the upslope skid to the ground prior to lowering the downslope skid.
11. Which action would be appropriate for confined area operations?
 - A—Takeoff and landings must be made into the wind.
 - B—Plan the flightpath over areas suitable for a forced landing.
 - C—a very steep angle of descent should be used to land on the selected spot.

-
- 12.** The principal reason the shaded area of a Height vs. Velocity Chart should be avoided is
- A—turbulence near the surface can dephase the blade dampers.
 - B—rotor rpm may decay before ground contact is made if an engine failure should occur.
 - C—insufficient airspeed would be available to ensure a safe landing in case of an engine failure.
- 13.** Takeoff from a slope is normally accomplished by
- A—moving the cyclic in a direction away from the slope.
 - B—bringing the helicopter to a level attitude before completely leaving the ground.
 - C—moving the cyclic stick to a full up position as the helicopter nears a level attitude.
- 14.** Which is a correct general rule for pinnacle and ridgeline operations?
- A—Gaining altitude on takeoff is more important than gaining airspeed.
 - B—The approach path to a ridgeline is usually perpendicular to the ridge.
 - C—A climb to a pinnacle or ridgeline should be performed on the upwind side.
- 15.** Before beginning a confined area or pinnacle landing, the pilot should first
- A—execute a high reconnaissance.
 - B—execute a low reconnaissance.
 - C—fly around the area to discover areas of turbulence.
- 16.** Under what condition should a helicopter pilot consider using a running takeoff?
- A—When gross weight or density altitude prevents a sustained hover at normal hovering altitude.
 - B—When normal climb speed is assured between 10 and 20 feet.
 - C—When the additional airspeed can be quickly converted to altitude.
- 17.** If possible, when departing a confined area, what type of takeoff is preferred?
- A—A normal takeoff from a hover.
 - B—A vertical takeoff.
 - C—A normal takeoff from the surface.
- 18.** The proper action to initiate a quick stop is to apply
- A—forward cyclic and lower the collective pitch.
 - B—aft cyclic and raise the collective pitch.
 - C—aft cyclic and lower the collective pitch.
- 19.** Which flight technique is recommended for use during hot weather?
- A—Use minimum allowable rpm and maximum allowable manifold pressure during all phases of flight.
 - B—During hovering flight, maintain minimum engine rpm during left pedals turns and maximum engine rpm during right pedal turns.
 - C—During takeoff accelerate slowly into forward flight.
- 20.** What action should the pilot take if engine failure occurs at altitude?
- A—Open the throttle as the collective pitch is raised.
 - B—Reduce cyclic back stick pressure during turns.
 - C—Lower the collective pitch control as necessary, to maintain rotor rpm.

Stage 3 Exam

Cross-Country Flight

Name: _____

Grade: _____ Date: _____

Instructor: _____

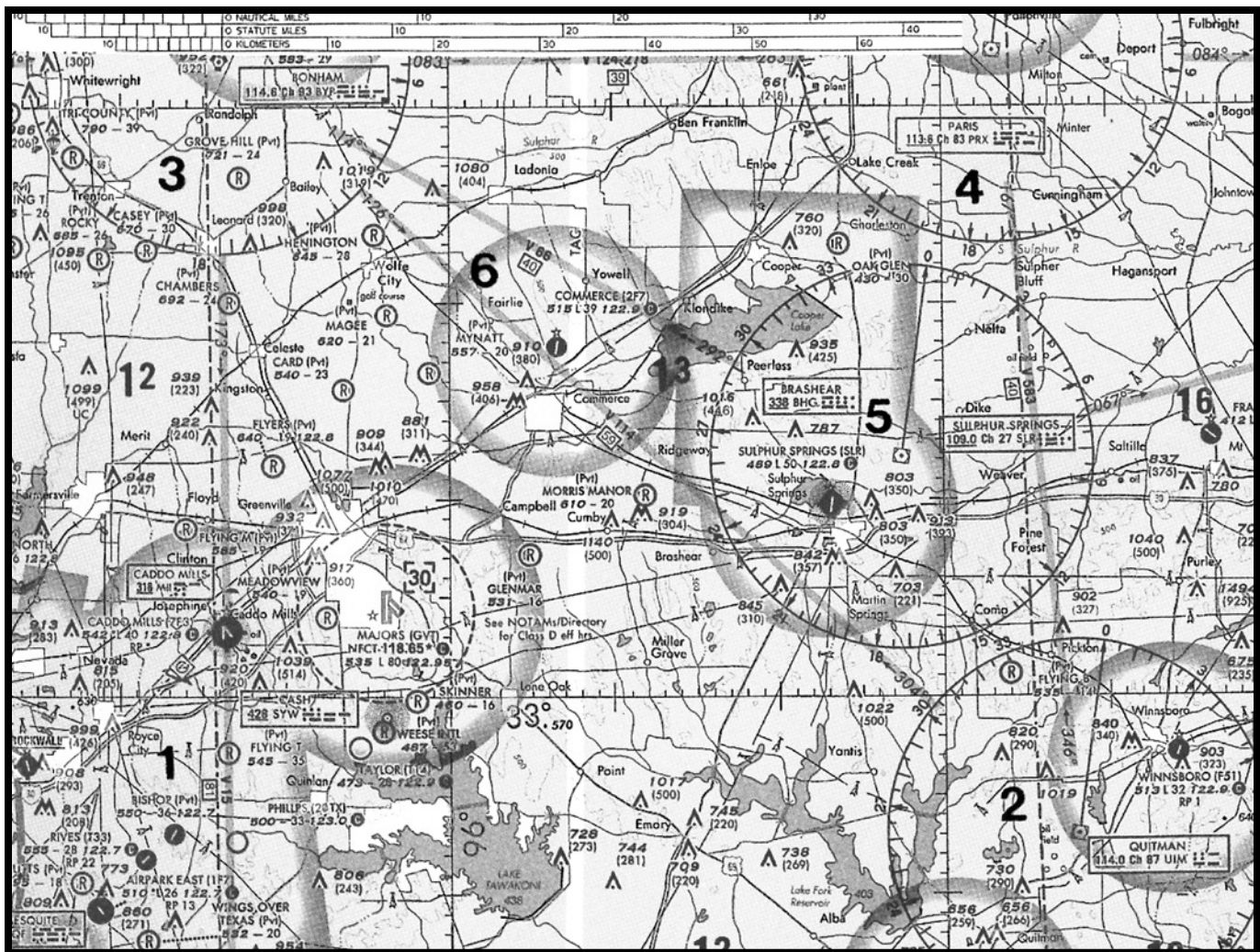
Choose the most correct answer choice.

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

	Weight (lb)	Arm (in)	Moment (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.
- 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.

- When converting from true course to magnetic heading, a pilot should
 A—subtract easterly variation and right wind correction angle.
 B—add westerly variation and subtract left wind correction angle.
 C—subtract westerly variation and add right wind correction angle.
- How many Global Positioning System (GPS) satellites are required to yield a three dimensional position (latitude, longitude, and altitude) and time solution?
 A—5
 B—6
 C—4
- 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.
- (Refer to Exam Figure 1.) What is the approximate position of the aircraft if the VOR receivers indicate the 245° radial of Sulphur Springs VOR-DME (area 5) and the 140° radial of Bonham VORTAC (area 3)?
 A—Meadowview airport.
 B—Glenmar airport.
 C—Majors airport.
- (Refer to Exam Figure 1.) On what course should the VOR receiver (OBS) be set in order to navigate direct from Majors Airport (area 1) to Quitman VORTAC (area 2)?
 A—101
 B—208
 C—281



Exam Figure 1. Sectional chart excerpt.

- 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.** (Refer to Exam Figure 2, illustration 1.) The VOR receiver has the indications shown. What is the aircraft's position relative to the station?

A—North
 B—East
 C—South
- 15.** 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

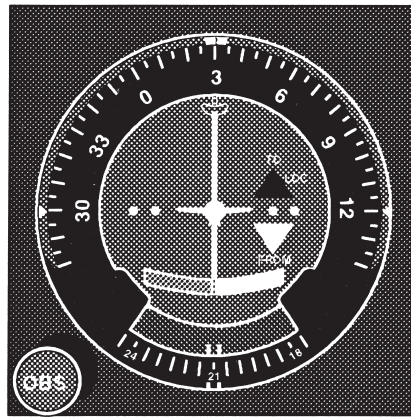
A—0000.
 B—1200.
 C—4096.
- 16.** If you are 3 NM off-course to the right in 20 NM, what is your tracking error?

A—9° left.
 B—9° right.
 C—12° right.

-
- 17.** 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
- 18.** 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.
- 19.** (Refer to Exam Figure 2, illustration 8.) The VOR receiver has the indications shown. What radial is the aircraft crossing?
- A—030
 - B—210
 - C—300
- 20.** What procedure is recommended when climbing or descending VFR on an airway?
- A—Execute gentle banks left and right for continuous visual scanning of the airspace.
 - B—Advise the nearest FCC of the altitude changes.
 - C—Fly away from the centerline of the airway before changing altitude.



1



2



3



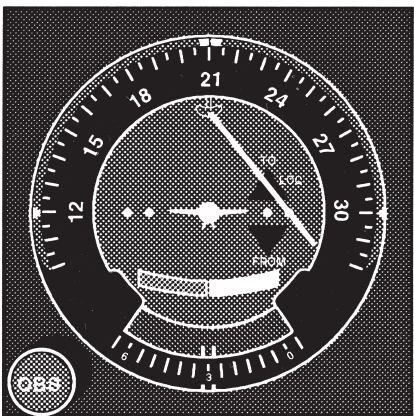
4



5



6



7



8



9

Exam Figure 2. VOR.

Stage 4 Final Exam

Prep for Checkride

Name: _____

Grade: _____ Date: _____

Instructor: _____

Choose the most correct answer choice.

1. 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.
2. If recency of experience requirements for night flight are not met and official sunset is 1830, the latest time passengers may be carried is
A—1829.
B—1859.
C—1929.
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. Except when necessary for takeoff or landing, what is the minimum safe altitude for a pilot to operate an aircraft anywhere?
A—An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.
B—An altitude of 500 feet above the surface and no closer than 500 feet to any person, vessel, vehicle or structure.
C—An altitude of 500 feet above the highest obstacle within a horizontal radius of 1,000 feet.
5. During a night flight, you observe steady red and green lights ahead and at the same altitude. What is the general direction of movement of the other aircraft?
A—The other aircraft is crossing to the left.
B—The other aircraft is flying away from you.
C—The other aircraft is approaching head on.
6. When changing from autorotation for maximum endurance to one for maximum range, the airspeed must be _____ and the rate of descent will _____.
A—increase, decrease.
B—decrease, increase.
C—increase, increase.
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.

```
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 3.

- 9.** (Refer to Exam Figure 3.) 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.
- 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.** Offset flapping hinges _____ assist in keeping the fuselage parallel with the rotor disc and they allow a _____ range of center of gravity position.
- A—do/narrower
 - B—do not/wider
 - C—do/wider
- 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.** According to the Private Rotorcraft Practical Test Standards, during a straight in autorotation a student is required to come to a hover within _____ feet of a designated point.
- A—200
 - B—100
 - C—300
- 14.** According to the Private Rotorcraft Practical Test Standards, a student must maintain what accuracy standards during navigation tasks
- A—+/- 100 feet altitude, +/- 10 degrees heading.
 - B—+/- 200 feet altitue, +/- 10 degrees heading.
 - C—+/- 200 feet altitude, +/- 15 degrees heading.
- 15.** Which light signal from the control tower clears a pilot to taxi?
- A—Flashing green.
 - B—Steady green.
 - C—Flashing white.
- 16.** How should contact be established with an En Route Flight Advisory Service (EFAS) station, and what service would be expected?
- A—Call EFAS on 122.2 for routine weather, current reports on hazardous weather, and altimeter settings.
 - B—Call EFAS on 122.5 for advisory service pertaining to severe weather.
 - C—Call EFAS on 122.0 for information regarding actual weather and thunderstorm activity along proposed route.
- 17.** If you have to land on a high level landing site surrounded by irregular features you should aim to complete the approach _____
- A—short of the site.
 - B—over the site.
 - C—on the site.
- 18.** If there is an inversion above your planned cold mountain landing site, you should anticipate that translational lift will _____ as you descend through the inversion.
- A—increase
 - B—decrease
 - C—remain the same
- 19.** Generally ice accretion is _____ on sharp objects.
- A—faster
 - B—slower
 - C—the same
- 20.** A major risk of rotor blade icing is the resulting unbalancing of blades which can cause _____ on landing.
- A—recirculation
 - B—ground resonance
 - C—asymmetric loading

Principles of Helicopter Flight Syllabus



Second Edition

Principles of Helicopter Flight, by Walter J. Wagtendonk, explains the complexities of helicopter flight in clear, easy-to-understand terms. The worldwide helicopter industry has waited a long time to see a manual of this caliber.

Helicopter pilots need to thoroughly understand the consequences of their actions, and base them upon sound technical knowledge. This textbook provides the background knowledge explaining why the helicopter flies and, more importantly, why it sometimes doesn't. It examines the aerodynamic factors associated with rotor stalls, mast bumping, wind effect, as well as the maneuvering flight to include the hover, forward flight, the flare, autorotation. Helicopter design and components, performance, and weight and balance is covered, along with special techniques such as different types of takeoffs and landings, operating on sloping surfaces, sling operations, mountain flying, and helicopter icing. Technical knowledge and sound handling are the ingredients that make a pilot safe.

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"Wal" Wagtendonk served in the Royal New Zealand Air Force, retiring as an A-2 instructor in 1960. After working with the Nelson Aero Flight Club as Manager and Chief Flight Instructor, Wal, with his wife Ann, formed the Nelson Aviation College in Motueka, which blossomed into one of New Zealand's best known theory and flight training establishments. Nelson Aviation College became the first "approved" school to conduct both fixed-wing and helicopter courses, and

many experienced helicopter pilots currently flying all over the world started their basic training under Wal's careful instruction.

Wal was born in The Netherlands, and emigrated to New Zealand at age 20. Having retired in 1990, Wal and Ann now reside in the Bay of Plenty on New Zealand's North Island.



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