

Semper Fly Helicopters

14 CFR PART 141 FLIGHT SCHOOL



**AVIA 4111 - COMMERCIAL PILOT GROUND STAGE I
ROTORCRAFT / HELICOPTER
CERTIFICATION COURSE
GROUND TRAINING MANUAL**

TABLE OF CONTENTS

SECTION	PAGE
<u>Section 1 - Ground Training Syllabus</u>	1-1
1.1 <u>Course Requirements and Objectives</u>	1-1
1.2 <u>Commercial Pilot Course Minimum Time Summary</u>	1-3
1.3 <u>Grading Rubric</u>	1-4
<u>Section 2 - Stage One Ground Training</u>	2-1
2.1 <u>Lesson 1: Discovering Aviation</u>	2-3
2.2 <u>Lesson 2: Aeronautical Decision Making</u>	2-4
2.3 <u>Lesson 3: Ground Operations & Flight Maneuvers</u>	2-5
2.4 <u>Lesson 4: Principles of Flight - Part 1</u>	2-6
2.5 <u>Lesson 5: Principles of Flight - Part 2</u>	2-7
2.6 <u>Lesson 6: Helicopter Systems & Instruments - Part 1</u>	2-8
2.7 <u>Lesson 7: Helicopter Systems & Instruments - Part 2</u>	2-9
2.8 <u>Lesson 8: The Flight Environment - Part 1</u>	2-10
2.9 <u>Lesson 9: The Flight Environment - Part 2</u>	2-11
2.10 <u>Lesson 10: The Flight Environment - Part 3</u>	2-12
2.11 <u>Lesson 11: Communications & Performance - Part 1</u>	2-13
2.12 <u>Lesson 12: Communications & Performance - Part 2</u>	2-14
2.13 <u>Lesson 13: Emergency Procedures - Part 1</u>	2-15
2.14 <u>Lesson 14: Emergency Procedures - Part 2</u>	2-16
2.15 <u>Lesson 15: Advance Maneuvers</u>	2-17
2.16 <u>Lesson 16: Special Considerations</u>	2-18
2.17 <u>Lesson 17: Regulations, Endorsements, & Airworthiness</u>	2-19
2.18 <u>Lesson 18: Meteorology for Pilots - Part 1</u>	2-20
2.19 <u>Lesson 19: Meteorology for Pilots - Part 2</u>	2-21
2.20 <u>Lesson 20: Interpreting Weather Data - Part 1</u>	2-22
2.21 <u>Lesson 21: Interpreting Weather Data - Part 2</u>	2-23
2.22 <u>Lesson 22: Stage One Review - Part 1</u>	2-24
2.23 <u>Lesson 23: Stage One Review - Part 2</u>	2-25
2.24 <u>Lesson 24 - Stage One Final Test & Evaluation</u>	2-26

SECTION 1 - GROUND TRAINING SYLLABUS

1.1 - Course Requirements and Objectives

Enrollment Prerequisites

The Semper Fly Helicopters Commercial Pilot Rotorcraft / Helicopter Ground Training Course is designed to have the students concurrently enrolled in the associated Semper Fly Helicopters Commercial Pilot Rotorcraft / Helicopter Flight Training Course. As such, students must meet the following criteria:

1. Minimum Age: 17
2. English Proficiency - Students must be proficient in reading, writing, and speaking English to comply with FAA regulations
3. Financial Readiness - Students must be able to provide proof of ability to finance the training program, either through personal funds, loans, or GI Bill benefits for eligible veterans
4. Interview and Assessment - Semper Fly Helicopters reserves the right to conduct an interview in which the motivation and fitness for flight training can be assessed
5. Required Documents
 - A. U.S. Citizens
 - i. Proof of U.S. Citizenship
 - ii. Valid, unexpired U.S. passport OR
 - iii. Original or government-issued birth certificate of the U.S., American Samoa, or Swains Island AND a government-issued picture identification OR
 - iv. Original certification of birth abroad with raised seal (Form FS-545 or Form DS-1350) AND a government-issued picture identification OR
 - v. Original certificate of U.S. citizenship with raised seal (Form N-560 or N-561) or a Certificate of Repatriation (Form N-581) AND government-issued picture ID OR
 - vi. Original U.S. Naturalization Certificate with raised seal (Form N-550 or N-570) AND a government-issued picture ID
 - vii. FAA Class I or Class II Medical
 - viii. FAA Airman's Certificate: Private Pilot Certificate (Rotorcraft)
 - ix. FAA Airman's Certificate: Instrument Pilot Certificate (Rotorcraft)
 - x. FAA Knowledge Test (if completed)
 - B. Foreign Nationals
 - i. Passport
 - ii. Visa
 - iii. FAA Class I or Class II Medical
 - iv. Complete TSA Training application

Additionally, all students must satisfy the requirements identified in Part 141; Appendix D, applicable to the certificate or rating sought by the learner. If the student is degree seeking, they must meet the enrollment criteria of the University of Oklahoma Aviation Department.

Ground Training Course Objective

The student will develop the knowledge specified by 14 CFR Part 141 Appendix D and the Airman Certification Standards for a Commercial Pilot Rotorcraft / Helicopter certificate. The student will be expected to utilize this knowledge to receive a passing score on the Commercial Pilot Knowledge Test.

Ground Training Course Completion Standards

The ground-training course will be completed when the student pilot demonstrates knowledge that meets or exceeds those standards as outlined in the Semper Fly Helicopters Standard Operating Procedures and Safety Policies Manual and the Airman Certification Standards.

*(The ground curriculum contained in this training course outline may be substituted with previous training given that the student is credited no more than 50 percent of the aeronautical knowledge training requirements of this curriculum.)

Ground Training Curriculum

Ground school for the Commercial Pilot student is accomplished by enrollment in the course and a minimum of 62.0 classroom hours. An outline for each lesson is provided in the following Ground Training Syllabus. The academic instructor will be responsible for student knowledge who obtained credit by exam or who have not taken these courses.

Ground Training Textbooks

The ground-training course is structured by the Helicopter Pilot Textbook. Jeppesen Sanderson, Inc., the Federal Regulations FAR/AIM. Ground training lessons generally follow the sequence and content of these textbooks. Other required reference materials are listed in the Introduction Section of the Airman Certification Standards.

Training Records

Semper Fly Helicopters will establish and maintain current and accurate records of the participation of each student enrolled in the aviation program. These records will include as a minimum the date the student was enrolled, a chronological log of the student's course attendance, the subjects, and flight operations covered in the student's training, and the names and grades of any tests taken by the student. Additionally, a record will be maintained on the date the student graduated, terminated training, or transferred to another school. Whenever a student graduates, terminates training, or transfers to another school, the student's record will be certified to that effect by the chief instructor. The school will retain each student record for at least 1 year from the date that the student either graduates from the course to which the record pertains, terminates enrollment in the course to which the record pertains, or transfers to another school. These records will be kept in accordance with 14 CFR 141.101. The school will make a copy of these records available to the student upon request.

1.2 - Commercial Pilot Course
Minimum Time Summary

<u>TRAINING STAGE</u>	<u>DUAL</u>	<u>SOLO</u>	<u>X/C</u>	<u>NIGHT</u>	<u>ORAL</u>	<u>GROUND</u>
Ground Stage One						31.2
SUB-TOTAL						31.2

TOTAL GROUND TIME FOR COMMERCIAL PILOT COURSE: 62.0 HOURS

TOTAL FLIGHT TIME FOR COMMERCIAL PILOT COURSE: 85.0 HOURS

TOTAL SIMULATOR TIME FOR COMMERCIAL PILOT COURSE: 20.0 HOURS

1.3 - Grading Rubric

After each lesson, the instructor will assign grades for each ground or flight activity using the following scale:

GRADE	STUDENT PERFORMANCE	DESCRIPTION
A	Exceeds Standards	The student meets the FAA Airman Certification Standards and usually (50% of the time or more) exceeds those standards.
B	Meets Standards	The student meets the FAA Airman Certification Standards.
C	Below Standards	The student does not meet the FAA Airman Certification Standards.
F	Failure	Student non-participation or refusal to re-train
I	Incomplete	The allotted time was not sufficient for the student to perform the activity.
NG	Not Graded	The activity was not assigned to the student and will <u>not</u> be required to be completed in a separate training session.

NOTES

- With a grade of C, or F, the instructor must include amplifying comments on the grade form
- With a grade of C, F, or I, the student will be required to complete the activity to the FAA Airman Certification Standards in a separate training session.

SECTION 2 - STAGE ONE GROUND TRAINING

OBJECTIVES:

The primary concentration during Stage One is on the fundamentals of flight, flight operations, aviation weather, emergency procedures, and flight maneuvers. Instruction will cover advanced aerodynamics, engine operation, and flight instruments. This stage also covers the flight environment to include safe airport operations, VFR communications, the Federal Regulations relating to helicopter operations, the airspace for VFR pilots, advanced aviation meteorology, aviation weather services, accident reporting procedures, aeronautical charts, effects of density altitude, weight and balance, aeronautical decision making, preflight actions, and flight publications.

Each student must read the syllabus content material prior to arriving for class. The student must be prepared to discuss the subject content during class.

REFERENCES:

1. The Semper Fly Helicopters Training Syllabus for the Commercial Pilot Rotorcraft / Helicopter Certification Course
2. The Semper Fly Helicopters Standard Operating Procedures and Safety Policies Manual
3. The Semper Fly Helicopters Private / Commercial Study Guide
4. Guimbal Cabri G2 Flight Manual
5. Guimbal Cabri G2 Flight Instructor Guide
6. Helicopter Pilot Textbook. Jeppesen Sanderson, Inc
7. Aeronautical Decision Making for Commercial Pilots
8. The FAR/AIM Manual
9. Commercial Pilot for Rotorcraft Category Helicopter Rating Airman Certification Standards, FAA-S-ACS-16
10. Risk Management Handbook, FAA-H-8083-2

COMPLETION STANDARDS:

The student should have the advanced knowledge required at the Commercial Pilot level of advanced aerodynamics, engine operation, the operation and displays of flight instruments and being able to calculate weight and balance and performance problems using the helicopter manuals.

INDEX

LESSON	HOURS	PAGE
<u>2.1 - Lesson 1: Discovering Aviation</u>	1.3	2-3
<u>2.2 - Lesson 2: Aeronautical Decision Making</u>	1.3	2-4
<u>2.3 - Lesson 3: Ground Operations & Flight Maneuvers</u>	1.3	2-5
<u>2.4 - Lesson 4: Principles of Flight - Part 1</u>	1.3	2-6
<u>2.5 - Lesson 5: Principles of Flight - Part 2</u>	1.3	2-7
<u>2.6 - Lesson 6: Helicopter Systems & Instruments - Part 1</u>	1.3	2-8
<u>2.7 - Lesson 7: Helicopter Systems & Instruments - Part 2</u>	1.3	2-9
<u>2.8 - Lesson 8: The Flight Environment - Part 1</u>	1.3	2-10
<u>2.9 - Lesson 9: The Flight Environment - Part 2</u>	1.3	2-11
<u>2.10 - Lesson 10: The Flight Environment - Part 3</u>	1.3	2-12
<u>2.11 - Lesson 11: Communications & Performance - Part 1</u>	1.3	2-13
<u>2.12 - Lesson 12: Communications & Performance - Part 2</u>	1.3	2-14
<u>2.13 - Lesson 13: Emergency Procedures - Part 1</u>	1.3	2-15
<u>2.14 - Lesson 14: Emergency Procedures - Part 2</u>	1.3	2-16
<u>2.15 - Lesson 15: Advanced Maneuvers</u>	1.3	2-17
<u>2.16 - Lesson 16: Special Considerations</u>	1.3	2-18
<u>2.17 - Lesson 17: Regulations, Endorsements, & Airworthiness</u>	1.3	2-19
<u>2.18 - Lesson 18: Meteorology for Pilots - Part 1</u>	1.3	2-20
<u>2.19 - Lesson 19: Meteorology for Pilots - Part 2</u>	1.3	2-21
<u>2.20 - Lesson 20: Interpreting Weather Data - Part 1</u>	1.3	2-22
<u>2.21 - Lesson 21: Interpreting Weather Data - Part 2</u>	1.3	2-23
<u>2.22 - Lesson 22: Stage One Review - Part 1</u>	1.3	2-24
<u>2.23 - Lesson 23: Stage One Review - Part 2</u>	1.3	2-25
<u>2.24 - Lesson 24: Stage One Final Test & Evaluation</u>	1.3	2-26
GROUND STAGE ONE - TOTAL HOURS	31.2	

2.1 - LESSON 1: DISCOVERING AVIATION

(Ground: 1.3 Hours)

OBJECTIVES:

To introduce the student to the available commercial aviation careers, the Aeronautical Information Manual (AIM), FAA advisories, aviation industry, and to explain the training process and requirements to become a certificated Commercial Pilot.

CONTENTS:

1. Pilot Training
 - A. What is Commercial Flying All About?
 - B. The Training Process
 2. Aviation Opportunities
 - A. Refresher Training
 - B. Airplane Transitions
 - C. Additional Pilot Ratings
 - D. Commercial Aviation Careers
 3. Aeronautical Information Manual (AIM)
 4. Federal Aviation Administration (FAA) Advisories
 5. Recommended / Required Equipment and Books
 6. FSP Tutorial
- Review of Semper Fly Helicopters Standard Operating Procedures and Safety Policies Manual and signing of agreement form

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student displays a fundamental understanding of the aviation industry, the pilot training process, and the requirements necessary to become a safe and responsible certificated Commercial Pilot.

Additionally, the student will exhibit an understanding of the purpose of the AIM as well as FAA advisories.

2.2 - LESSON 2: AERONAUTICAL DECISION MAKING

(Ground: 1.3 Hours)

OBJECTIVES:

The objectives are to explain Human Factors and their relation to Aeronautical Decision Making (ADM) and aviation physiology as well as the Federal Regulations concerning Commercial Pilot limitations and the scope of NTSB, FAR 830.

CONTENTS:

1. Introduction to Human Factors
 - A. Aeronautical Decision Making
 - B. Aviation Physiology
 - C. Acronym Explanation
 - i. 3PS
 - ii. IMSAFE
 - iii. DECIDE
2. Commercial Pilot Federal Regulations
 - A. Privileges and Limitations
 - B. Flight operations
3. National Transportation Safety Board (NTSB), FAR Part 830 Accident Reporting

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student displays an advanced understanding of Human factors, Aeronautical decision making, including stress and fatigue, aviation physiology, the Federal Regulations concerning Commercial Pilot limitations and flight limitations as well as the contents and scope of NTSB, FAR Part 830.

2.3 - LESSON 3: GROUND OPERATIONS & FLIGHT MANEUVERS

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to provide the student with an introduction to an entire flight lesson from start to finish. All aspects of the flight lesson will be discussed from Safety Procedures, Pre-flight Checks, Start up, Basic helicopter maneuvers (Hovering, Departures, Climbs, Descents, Turns, Approaches), and Shut down procedures.

CONTENTS:

1. Safety Procedures - Consider Buildings, Bystanders, Debris, and Rotor speed
2. Pre Flight Check and Engine Starting
 - A. Checklists
 - B. Pre Flight Inspection
 - C. Starting Procedure
 - D. Rotor Engagement
 - E. Systems Ground Check
3. Hovering Flight - Clearing Turns, Communication, Wind Consideration
 - A. Takeoff from a Hover - Normal and Crosswind
 - B. Vertical Landing From a Hover - Normal and Crosswind
 - C. Hand Signals
4. Departures - From a Hover or Surface
5. Flight Maneuvers
 - A. Straight-and-Level Flight
 - B. Controlling Heading and Altitude
 - C. Altitude and Collective Movements
 - D. Directional Control and Cyclic Movement
 - E. Effects of Pedal Movement & Trim
 - F. Control Coordination
 - G. Airspeed, Power, and Altitude
 - H. Kinesthetic Sense
6. Climbs, Descents, and Turns
 - A. Climbs - Speeds and Leveling off
 - B. Descents - Controlling Rate and Leveling off
 - C. Turns - Entering/Exiting
 - D. Climbing / Descending Turns
7. Approaches - To a Hover and Go-arounds
8. Shutdown and Tie-down Procedures
 - A. Engine Shutdown Procedures
 - B. Moving the Helicopter / Ground considerations

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student demonstrates an advanced knowledge of the unique safety considerations pertaining to helicopters, preflight, start up, fundamentals associated with controlling the helicopter during various phases of flight, and shut-down procedures.

2.4 - LESSON 4: PRINCIPLES OF FLIGHT - PART 1

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to explain the parts of a helicopter and the advanced principles of operation and the components of the helicopter, flight instruments, and aerodynamics concerning flight.

CONTENTS:

1. Introduction to the Helicopter
 - A. The Main Rotor System
 - B. Anti-Torque Systems
 - C. Landing Gear
 - D. Powerplant
 - E. Aircraft Certification
2. Flight Instruments
3. Aerodynamic Forces
 - A. Lift
 - B. Bernoulli's Principle
 - C. Law of Motion
 - D. Airfoils
 - E. Aerodynamic Terminology
 - F. Weight
 - G. Drag
 - H. Thrust

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination; the student displays an advanced understanding of the parts of a helicopter, the flight instruments and the aerodynamic forces associated with flight.

2.5 - LESSON 5: PRINCIPLES OF FLIGHT - PART 2

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to explain further the forces of flight as well as the scope and content of SFAR 73.

CONTENTS:

4. Forces in Flight
 - A. Hovering
 - B. Ground Effect
 - C. Forward Flight
 - D. Translational Lift
 - E. Dissymmetry of Lift
 - F. Transverse Flow Effect
 - G. Coriolis Effect
 - H. Autorotation
 - I. Height/Velocity Diagram
 - J. Weight vs. Density Altitude
 - K. Airflow During Autorotation
 - L. Airflow During Autorotation
 - M. The Three Axes
 - N. Turning Flight
 - O. Coordination in Turns
5. SFAR - Robinson Special Training and Experience Requirements
 - A. Energy Management
 - B. Mast Bumping
 - C. Low Rotor RPM (Blade Stall)
 - D. Low G Hazards
 - E. Rotor RPM Decay

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination; the student displays an advanced understanding of the forces of flight and SFAR 73.

2.6 - LESSON 6: HELICOPTER SYSTEMS & INSTRUMENTS - PART 1

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to explain the components of the flight control systems, operation and information derived from engine gauges relating to performance as well as engine operation, fuel systems and electrical systems.

CONTENTS:

1. Flight Control Systems
 - A. Collective Pitch
 - B. Cyclic Pitch
 - C. Swash Plate Assembly
 - D. Anti-torque Control
 - E. Trim Systems
 - F. Friction Systems
2. Engine Gauges Related to Performance
 - A. Tachometer
 - B. Manifold Pressure Gauge
3. The Reciprocating Engine and Related Systems
 - A. Principles of Operation
 - B. Four-Stroke Operating Cycle
 - C. Abnormal Combustion
 - D. Ignition System
 - E. Oil System
 - F. Cooling the Engine
4. Fuel and Electrical Systems
 - A. Fuel System
 - B. Fuel Supply System
 - C. Induction System
 - D. Carburetor
 - E. Refueling
 - F. Fuel Grades
 - G. Electrical System
 - H. Alternators
 - I. Ammeter
 - J. Electrical Switches
 - K. Circuit Breakers and Fuses

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination; the student displays an advanced understanding of the components of the flight control systems, operation and information derived from engine gauges relating to performance as well as engine operation, fuel systems and electrical systems.

2.7 - LESSON 7: HELICOPTER SYSTEMS & INSTRUMENTS - PART 2

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to explain the powertrain systems and flight instruments relating to the helicopter.

CONTENTS:

5. Powertrain Systems
 - A. Clutch
 - B. Belt Drive Clutch
 - C. Centrifugal Clutch
 - D. Transmission
 - E. Tail Rotor Drive System
 - F. Freewheeling Unit
 - G. Main Rotor Systems
6. Flight Instruments
 - A. Magnetic Compass
 - B. Variation
 - C. Deviation
 - D. Compass Errors
 - E. Magnetic Dip
 - F. Acceleration/Deceleration Error
 - G. Turning Error
 - H. Minimizing Errors
 - I. Outside Air Temperature Gauge
 - J. Pitot-Static Instruments
 - K. Effects of Atmospheric Conditions
 - L. International Standard Atmosphere
 - M. Pitot-Static System
 - N. Airspeed Indicator
 - O. Altimeter
 - P. Vertical Speed Indicator
 - Q. Gyroscopic Flight Instruments
 - R. Rigidity in Space
 - S. Precession
 - T. Vacuum System
 - U. Attitude Indicator
 - V. Heading Indicator
 - W. Turn Indicator
 - X. Turn-and-Slip Indicator
 - Y. Turn Coordinator

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination; the student demonstrates an advanced understanding of power train systems and flight instruments relating to the operation of the helicopter.

2.8 - LESSON 8: THE FLIGHT ENVIRONMENT - PART 1

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to acquaint the student with different types of airports, airport layouts and heliports. The student will also be introduced to safety of flight concepts.

CONTENTS:

1. Safety of Flight
 - A. Visual Scanning/Blind Spots and Aircraft Design
 - B. Airport/Heliport Operations
 - C. Maneuvers in the Training Area
 - D. Right-of-Way Rules
 - E. Minimum Safe Altitudes
 - F. VFR Cruising Altitudes
 - G. Special Safety Considerations
2. Airports and Heliports
 - A. Airports
 - i. Controlled and Uncontrolled Airports
 - ii. Airport Elevation
 - iii. Traffic Patterns
 - iv. Runway Layout
 - v. Basic Runway Markings
 - vi. Ramp Area
 - B. Heliports
 - i. Basic Heliport Markings and Heliport Traffic
 - C. Taxiways
 - D. Airport and Heliports Aids
 - E. Airport Signs
 - F. Wind Direction Indicator
 - G. Segmented Circle
 - H. Airport and Heliport Lighting
 - I. Aeronautical Beacons
 - J. Obstruction Lighting
 - K. Approach Lighting System
 - L. Visual Glide Slope Indicators
 - M. Threshold Lights
 - N. Runway Edge Lights
 - O. Taxiway Lights
 - P. Pilot Control of Airport Lighting
 - Q. Runway Incursion/Collision Avoidance

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student demonstrates an advanced knowledge of the different types of airports, airport layouts, heliports as well as concepts, rules and considerations related to the safety of flight.

2.9 - LESSON 9: THE FLIGHT ENVIRONMENT - PART 2

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to acquaint the student with the various types of airspace.

CONTENTS:

- 3. Airspace
 - A. Controlled Airspace
 - B. Class A Airspace
 - C. Class B Airspace
 - D. Class C Airspace
 - E. Class D Airspace
 - F. Class E Airspace
 - G. Class G Airspace

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student demonstrates advanced knowledge of the various types of airspace.

2.10 - LESSON 10: THE FLIGHT ENVIRONMENT - PART 3

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to acquaint the student with the various types of airspace.

CONTENTS:

- 4. Airspace
 - A. Cloud Clearance and Visibility Requirements
 - B. Temporary Flight Restrictions (TFR's)
 - C. Airspeed Limitations
 - D. Special Use Airspace
 - i. Prohibited Areas
 - ii. Restricted Areas
 - iii. Warning Areas
 - iv. Military Operations Areas (MOAs)
 - v. Alert Areas
 - vi. Airport Advisory Area
 - E. Military Training Routes
 - F. Parachute Jump Areas
 - G. Emergency Air Traffic Rules
 - H. ADIZ

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student demonstrates advanced knowledge of the various types of airspace.

2.11 - LESSON 11: COMMUNICATIONS & PERFORMANCE - PART 1

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to familiarize the student with radio operation and procedures as well as radar and ATC services available to pilots.

CONTENTS:

1. Radio Procedures
 - A. VHF Communication Equipment
 - B. Federal Communications Commission
 - C. International Civil Aviation Organization
 - D. Using the Radio
 - E. Radio Procedures
 - F. Common Traffic Advisory Frequency
 - G. Flight Service Stations
2. Radar and ATC Services
 - A. Radar
 - B. Transponder
 - C. VFR Radar Services

COMPLETION STANDARDS:

This lesson will have been successfully completed when the student, by oral or written examination, shows that he or she possesses an advanced understanding of radio operation and procedures as well as radar and ATC services available to pilots.

2.12 - LESSON 12: COMMUNICATIONS & PERFORMANCE - PART 2

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to familiarize the student with predicting helicopter performance and the various elements of weight and balance and their effect on the aircraft.

CONTENTS:

3. Predicting Performance
 - A. Factors Affecting Performance
 - B. Density Altitude
 - C. Humidity
 - D. Surface Winds
 - E. Weight
 - F. Pilot's Operating Handbook
 - G. Performance Charts
 - H. Hovering Performance
 - I. Climb Performance
 - J. Best Rate of Climb
 - K. Cruise Performance
 - L. Operating Limitations and Markings
4. Weight and Balance
 - A. Aircraft Weight
 - B. Weight Limitations
 - C. Determining Empty Weight
 - D. Aircraft Balance
 - E. Forward Center of Gravity
 - F. Aft Center of Gravity
 - G. Weight and Balance Control
 - H. Weight and Balance Calculation

COMPLETION STANDARDS:

This lesson will have been successfully completed when the student, by oral or written examination, shows that he or she demonstrates knowledge of predicting performance and the various elements of weight and balance in relation to aircraft.

2.13 - LESSON 13: EMERGENCY PROCEDURES - PART 1

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to introduce and explain various emergency procedures and situations associated with operating a helicopter.

CONTENTS:

1. Emergency Procedures (Autorotation)
 - A. Low Rotor RPM and Blade Stall
 - B. Autorotation
 - C. Initiating an Autorotation
 - D. Terminating The Autorotation
 - E. Power Recovery
 - F. Flare Touchdowns
 - G. Autorotation from a Hover
 - H. Initiating the autorotation from a Hover
 - I. Terminating the autorotation from a Hover
2. Emergency Situations
 - A. Settling With Power
 - B. Retreating Blade Stall
 - C. Ground Resonance
 - D. Dynamic Rollover
 - E. Low G Conditions and Mast Bumping
 - F. Recovery From Low Rotor RPM
 - G. Partial Power
 - H. Unanticipated Yaw/Loss of Tail Rotor Effectiveness (LTE)
 - I. Main Rotor Disc Interference (285 – 315 degrees)
 - J. Weathercock Stability (120 – 240 degrees)
 - K. Tail Rotor Vortex Ring State (210 – 330 degrees)
 - L. LTE at Altitude
 - M. Reducing the onset of LTE
 - N. Recovery Technique

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student demonstrates an advanced knowledge associated with the emergency procedures and situations contained in this lesson.

2.14 - LESSON 14: EMERGENCY PROCEDURES - PART 2

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to introduce and explain some of the fundamentals of responding to an emergency as discussed as well as referencing the Pilot Operating Handbook for corrective or appropriate action when applicable.

CONTENTS:

3. Systems and Equipment Malfunction
 - A. Electrical System Malfunctions
 - B. Alternator Failure
 - C. Battery
 - D. Engine and Components Malfunctions
 - E. High Engine Temperature
 - F. Low Oil Pressure
 - G. Warning Lights
 - H. Fires
 - I. Fire During Engine Start
 - J. Engine Fire in Flight
 - K. Electrical Fire in Flight
 - L. Anti Torque System Failure
 - M. Hydraulics Failure
 - N. Abnormal Vibrations
 - O. Low Frequency Vibrations
 - P. Medium Frequency Vibrations
 - Q. High Frequency Vibrations

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student demonstrates an advanced knowledge of the appropriate actions in response to the various system and equipment malfunctions contained in this lesson.

2.15 - LESSON 15: ADVANCED MANEUVERS

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to introduce and explain advanced maneuvers associated with helicopter operations as well as various considerations, techniques, and procedures associated with night operations.

CONTENTS:

1. Advanced Helicopter Maneuvers
 - A. Maximum Performance Takeoff and Climb
 - B. Steep Approach
2. High Altitude Operations
 - A. High Altitude Takeoffs
 - B. High Altitude Landings
3. Rapid Decelerations
 - A. Rapid Deceleration (Quick Stop)
4. Slope Operations
 - A. Slope Operations
 - B. Slope Landings
 - C. Slope Takeoff
5. Night Operations
 - A. Night Considerations
 - B. Preflight Inspection
 - C. Collision Avoidance at Night
 - D. Night Flight
 - E. Taxi Technique
 - F. Takeoff
 - G. Enroute Procedures
 - H. Approach and Landing
 - I. Slope Takeoff

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student demonstrates an advanced knowledge on performing more advanced helicopter maneuvers referenced in this lesson and various considerations, techniques and procedures unique to night operations.

2.16 - LESSON 16: SPECIAL CONSIDERATIONS

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to introduce and explain helicopter operations and considerations associated with confined areas and pinnacles.

CONTENTS:

1. Confined Area and Pinnacle Operations
 - A. Confined Area Operations
 - B. Pinnacle Operations
 - C. Pinnacle Approach and Landing
 - D. Pinnacle Takeoff and Climb

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student demonstrates an advanced knowledge of operational considerations associated with confined areas and pinnacles.

2.17 - LESSON 17: REGULATIONS, ENDORSEMENTS, & AIRWORTHINESS

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to review all FAA regulations within the Airman Certification Standards and FAR/AIM pertaining to Airworthiness for the commercial pilot.

CONTENTS:

1. Commercial Pilot Requirements
 - A. Eligibility
 - B. Flight Training
 - C. Aeronautical Knowledge
2. ACS Review
3. Endorsements
4. Maintenance and Service Records
 - A. Maintenance Logs
 - B. SBs
 - C. ADs
 - D. Life Limited Parts
 - E. MMEL
 - F. MEL

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student demonstrates an advanced knowledge of regulations, endorsements, and airworthiness.

2.18 - LESSON 18: METEOROLOGY FOR PILOTS - PART 1

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to acquaint the student with basic weather theory and weather patterns relevant to flight operations.

CONTENTS:

1. Basic Weather Theory
 - A. The Atmosphere
 - B. Composition of the Atmosphere
 - C. Atmospheric Levels
 - D. Atmospheric Circulation
 - E. Convection
 - F. Atmospheric Pressure
 - G. Coriolis Force
 - H. Wind
 - I. Global/Local Wind Patterns
 - J. Sea and Land Breezes
 - K. Valley and Mountain Waves
 - L. Katabolic Winds
 - M. Moisture
 - N. Humidity
 - O. Visible Moisture
 - P. Clouds and Fog
 - Q. Precipitation
 - R. Dew and Frost
2. Weather patterns
 - A. Atmospheric Stability
 - B. Temperature and Moisture
 - C. Rising and Descending Air
 - D. Temperature Inversions
 - E. Observing Stable and Unstable Air
 - F. Types of Clouds: Low Clouds, Middle Clouds, High Clouds
 - G. Air Masses
 - H. Fronts/Types of Fronts
 - I. Frontal Discontinuities
 - J. Frontal Weather
 - K. Cold Fronts and Warm Fronts
 - L. Stationary Fronts/Frontal Occlusions

COMPLETION STANDARDS:

This lesson will be successfully completed when, by oral or written examination, the student demonstrates an appropriate advanced understanding of weather theory as well as weather patterns.

2.19 - LESSON 19: METEOROLOGY FOR PILOTS - PART 2

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to acquaint the student with different hazards associated with weather.

CONTENTS:

- 3. Weather Hazards
 - A. Thunderstorms
 - B. Life Cycle
 - C. Types of Thunderstorms
 - D. Thunderstorm Hazards
 - E. Thunderstorm Avoidance
 - F. Turbulence
 - G. Wind Shear
 - H. Convective Currents
 - I. Obstructions to Wind Flow
 - J. Clear Air Turbulence
 - K. Wake Turbulence
 - L. Low Visibility
 - M. Restrictions to Visibility
 - N. Wind Shear
 - O. Icing
 - P. Estimating Freezing Level
 - Q. Cold Weather Operations

COMPLETION STANDARDS:

The student will have successfully completed this lesson when, by oral or written examination, he or she demonstrates an advanced understanding of the weather hazards contained in this lesson.

2.20 - LESSON 20: INTERPRETING WEATHER DATA - PART 1

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to familiarize the student with sources and types of various aviation weather reports, forecast and graphic weather depictions.

CONTENTS:

1. Printer Reports and Forecasts
 - A. Aviation Routine Weather Report
 - B. Type of Report
 - C. Station Designator and Date/Time of Report/Modifier
 - D. Wind Information
 - E. Visibility
 - F. Present Weather
 - G. Sky Condition
 - H. Temperature and Dew Point
 - I. Altimeter
 - J. Remarks/Additional Reports
 - K. Terminal Aerodrome Forecast
 - L. Type of Report
 - M. Location Identifier and Issuance Date/Time
 - N. Valid Period
 - O. Forecast and Area Forecasts
 - P. Communication and Product Headers
 - Q. Precautionary Statements and Synopsis
 - R. VFR Clouds and Weather
 - S. Amendments
 - T. Winds and Temperatures Aloft Forecasts
 - U. Severe Weather Reports and Forecasts
2. Graphic Weather Products
 - A. Surface Analysis Chart
 - B. Graphical Forecasts for Aviation (GFA)
 - C. Low-Level Significant Weather Prognostic
 - D. Significant Weather Panels
 - E. Surface Prognostic Panels

COMPLETION STANDARDS:

This lesson will have been successfully completed when the student, by oral or written examination, shows that he or she can procure and interpret the various weather reports, forecasts, and depictions contained in this lesson.

2.21 - LESSON 21: INTERPRETING WEATHER DATA - PART 2

(Ground: 1.3 Hours)

OBJECTIVES:

The objective is to further familiarize the student with sources and types of aviation weather charts and reports. The student will be introduced to sources of weather information including how to obtain a preflight and in-flight weather briefing.

CONTENTS:

3. Preflight Weather Briefings
 - A. Standard Weather Briefing
 - B. Abbreviated Briefing
 - C. Outlook Briefing
 - D. Supplemental Weather Sources
4. In-Flight Weather Services
 - A. En route Flight Advisory Service
 - B. In-Flight Aviation Weather Advisories
 - C. AIRMET's and SIGMET's
 - D. Severe Weather Forecast Alerts
 - E. Center Weather Advisories
 - F. Hazardous In-Flight Weather Advisory Service
 - G. Automated Weather Observing System
 - H. Automated Surface Observation System

COMPLETION STANDARDS:

This lesson will have been successfully completed when the student, by oral or written examination, shows that he or she can procure, interpret, and use the aviation weather services contained in this lesson to help contribute to making a "go/no-go" and/or inflight decision based on available weather information.

2.22 - LESSON 22: STAGE ONE REVIEW - PART 1

(Ground: 1.3 Hours)

OBJECTIVES:

This lesson provides the student the first of two opportunities to review all material covered in Stage One and to prepare for the course final examination.

CONTENTS:

Review material covered in Stage One

COMPLETION STANDARDS:

This lesson will have been successfully completed when the student, by oral or written examination, shows that he or she has an advanced level of understanding of all the topics covered in Stage One.

2.23 - LESSON 23: STAGE ONE REVIEW - PART 2

(Ground: 1.3 Hours)

OBJECTIVES:

This lesson provides the student the second of two opportunities to review all material covered in Stage One and to prepare for the course final examination. The student will be introduced to the format of an oral examination.

CONTENTS:

1. Review material covered in Stage One
2. Oral examination format introduction

COMPLETION STANDARDS:

This lesson will have been successfully completed when the student, by oral or written examination, shows that he or she has an advanced level of understanding of all the topics covered in Stage One and knowledge of the oral examination format.

2.24 - LESSON 24: STAGE ONE FINAL TEST & EVALUATION

(Ground: 1.3 Hours)

OBJECTIVES:

The primary objective is to provide an incentive as well as the opportunity for the student to assimilate the information learned during Stage One.

REFERENCES:

1. Helicopter Pilot Textbook - Commercial Pilot
2. The FAR/AIM Manual
3. Aeronautical Decision Making for Commercial Pilots

CONTENTS:

This examination will cover Stage One material. The examination shall, as a minimum, consist of (but is not limited to) at least 25 questions such as fill-in-the-blanks, true/false, and matching.

COMPLETION STANDARDS:

Grading is based on the traditional scale:

- A = 90% to 100%
- B = 80% to 89%
- C = 70% to 79%
- D = 60% to 69%
- F = below 60%

Students who do not achieve a satisfactory score (80% +) must be scheduled for additional instruction in the area(s) of deficiency identified by the examination.