



**Commercial Pilot
Certification Course
(ASEL)
Ground Training
Syllabus
FAR Part 141**

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TECH AVIATION FLIGHT SCHOOL, INC.
APPROVED SCHOOL CERTIFICATE #TVMS353S
COMMERCIAL PILOT CERTIFICATION COURSE
AIRPLANE SINGLE-ENGINE LAND (ASEL)
GROUND TRAINING SYLLABUS

PRINT STUDENT NAME:

LAST NAME, FIRST NAME

**_____/_____/_____
DATE (mm/dd/yyyy)**

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INTRODUCTION

This ground training syllabus is designed to allow the pilot applicant to acquire the aeronautical knowledge needed to safely operate as a Commercial Pilot and satisfactorily complete the Commercial Pilot Knowledge Test.

Within this syllabus, there are two stages and nineteen separate lessons, each with stated objectives and completion standards that must be satisfied in order for the lesson to be complete. Adequate knowledge of the specified study material is necessary for satisfactory progress in the individual lessons and for overall progress in the course. The individual lesson times are not mandatory. The hours in each lesson are primarily for instructor and student guidance. Total specified training hours at the end of the course completion must be met (35 hours). However, before a student can receive a logbook endorsement or a ground school completion certificate, the sequence of lessons, including the course completion examination, must be satisfactorily completed.

Every lesson contains a training outline and a detailed list of items that the student must successfully complete. Normally, a lesson is complete in this allotted time. If a student is unable to master the lesson in the specified time, it is necessary to repeat all or portion of the lesson until completion standards are met.

This syllabus has two written stage examinations to check the student's progress, which must be passed. The course completion check at the end of this course assures that the student acquired the aeronautical knowledge required to satisfactorily complete the FAA Commercial Pilot (ASEL) Knowledge Test. The examination questions are extracted from the current FAA Commercial Pilot Knowledge Test questions in appropriate subject matter areas, or a reasonable facsimile.

A record of the ground training received, shall be formally documented on a chronological log of student attendance, including lessons covered, and names and grades of any tests taken.

TRAINING SYLLABUS

I. ENROLLMENT PREREQUISITES: There are no specific requirements to enroll in this ground training course. The applicant must hold a current private pilot certificate with an airplane single-engine land category and class rating prior to beginning the flight portion of the course. The applicant must also hold an Instrument Rating with an airplane single-engine land category and class rating, or be currently enrolled in an Instrument Rating Course (single-engine land), and pass the required Instrument Rating Practical Test prior to completing the Commercial Pilot Certification Course (ASEL). There are no prerequisites for beginning the ground training portion of this course.

II. GRADING CRITERIA
FOR THE STUDENT AND INSTRUCTOR:

- I. The overall performance grade for each lesson completed is based on the knowledge, preparation, skill, attitude, and judgment of the student.
- II. Grading criteria is to be based upon the building block method of instruction. A lesson is not complete unless the instructor is satisfied with the student's performance in all areas, and awards the student a grade of Satisfactory (S) or 80% or higher on the entire lesson. The above criteria should be used as a guideline for this assessment. Students will demonstrate satisfactory knowledge of lesson content and achievement of lesson objectives by active participation in class discussion and by correctly answering the instructor's verbal and written questions. Minimum passing score on the course completion examination is 80%. Incorrect responses shall be corrected to reinforce and ensure student understanding.

GROUND TRAINING LOG

Student Name: _____

	Lesson Time (h:min)	Actual Time Completed	Date Completed	Grade	Instructor Signature
201	1:30				
202	1:30				
203	2:00				
204	2:00				
205	2:00				
206□	1:00				
407	2:00				
408	2:00				
409	2:00				
410	2:00				
411	2:00				
412	2:00				
413	2:00				
414	2:00				
415	2:00				
416	2:00				
417	2:00				
418□	1:00				
419□	2:00				
Total	35:00:00				

√ Denotes Stage Check

◆ Denotes End of Course Check

STAGE I

STAGE OBJECTIVE

During this stage, the student will review airports, airspace, flight information, and meteorology, as well as airplane performance, VFR cross-country planning, and navigation. In addition, the student will gain a greater understanding of aviation physiology, aeronautical decision making, and the Federal Aviation Regulations applicable to commercial pilot operations.

STAGE COMPLETION STANDARDS

This stage is complete when the student has taken the Stage I Exam with a minimum passing score of 80%, and the instructor has reviewed each incorrect response to ensure complete understanding before the student progresses to Stage II.

LESSON 201: (1.5 Hours, Ground Instruction)

I. OBJECTIVE:

- Review the airport environment, airspace, and flight information including collision avoidance.
- Review the weather patterns and hazards related to flight operations, the information contained in printed weather reports and forecasts and graphic weather information.
- Review and improve knowledge of aeronautical charts for operations under VFR.

II. ACADEMIC CONTENT:

CHECK LIST

Airports, Airspace and Flight Information:

- Runway and Taxiway Markings _____
- Runway Incursion Avoidance _____
- Land and Hold Short Operations (LAHSO) _____
- Lighting Systems _____
- Airspace _____
- Procedures for operating in National Airspace System _____
- Flight Information _____

Weather:

- Weather Factors / Meteorology _____
- Recognition of Critical Weather Situations _____
 - Windshear Recognition and Avoidance _____
- Weather Hazards _____
- Use of Printed Reports and Forecasts _____
- Graphical Weather Products _____
- Sources of Weather Information _____

Aeronautical Charts

- Sectional Charts _____
- VFR Terminal Area Charts _____
- World Aeronautical Charts _____
- Longitude and Latitude _____
- Airport Data _____
- Navigation Aids / Use of Air Navigation Facilities _____
- Airspace _____
- Obstructions / Topographical Information _____

III. COMPLETION STANDARDS:

- Demonstrate understanding of the airport environment, airspace, and flight information during oral quizzing by the instructor at completion of lesson.
- Demonstrate understanding of weather factors, weather hazards, printed reports and forecasts, graphical weather information during oral quizzing.
- Demonstrate understanding of VFR aeronautical charts used for cross-country flight during oral quizzing by instructor before the student progresses to next ground lesson.

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Commercial Pilot Certification Course-ASEL

Ground Training Syllabus

LESSON 202: (1.5 Hours, Ground Instruction)

I. OBJECTIVE:

- Review and improve the student’s knowledge of Pilotage and dead reckoning navigation under VFR.
- Become familiar with guidelines and recommended procedures related to flight planning, including proper VFR cruising altitudes, route selection based on airspace, and lost procedures.

II. ACADEMIC CONTENT:

CHECK LIST

Pilotage and Dead Reckoning:

Use of Aeronautical Charts and a Magnetic Compass	_____
Pilotage	_____
Selecting Checkpoints	_____
Following a Route	_____
Orientation	_____
Dead Reckoning	_____
Navigation Plotter	_____
Flight Planning	_____
Navigation Log	_____
Flight Plan	_____
Position Reports	_____
Flying Over Hazardous Terrain	_____

Use of Air Navigation Facilities _____

III. COMPLETION STANDARDS:

- Demonstrate understanding of pilotage and dead reckoning methods for cross-country VFR flight during oral quizzing by instructor before the student progresses to next lesson.

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Commercial Pilot Certification Course-ASEL

Ground Training Syllabus

LESSON 203: (2.0 Hours, Ground Instruction)

I. OBJECTIVE:

- During this lesson, the student will review and become more familiar with the common physiological factors affecting day and night flight operations.
- The student also will learn the common adverse effects of these physiological factors.

II. ACADEMIC CONTENT:

CHECK LIST

Aviation Physiology:

Night Operations

-The Eye

-Night Vision

-Night Scanning

-Visual Illusions

-Auto-Kinesis

-Landing Illusions

-Flickering Vertigo

Disorientation

Illusions Leading to Disorientation

Motion Sickness

High-Altitude Operations

-Respiration

-Hypoxia

-Prevention of Hypoxia

-Hyperventilation

-Decompression Sickness

Alcohol, Drugs, and Performance

III. COMPLETION STANDARDS:

- Demonstrate knowledge of the physiological factors, especially vision affecting the pilot in flight operations.

LESSON 204: (2.0 Hours, Ground Instruction)

I. OBJECTIVE:

- During this lesson, the student will gain additional knowledge of the human factors concepts and crew resource management principles which affect aeronautical decision making and judgment.

II. ACADEMIC CONTENT:

CHECK LIST

Aeronautical Decision Making and Judgment:

Aeronautical Decision Making	_____
Crew Resource Management	_____
Decision-Making Process	_____
Pilot-in-Command Responsibility	_____
Hazardous Attitudes	_____
Communication	_____
Resource Use	_____
Workload Management	_____
Situational Awareness	_____

III. COMPLETION STANDARDS:

- Demonstrate understanding of human factors concepts and crew resource management principles and their effect on flight safety.

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Ground Training Syllabus

LESSON 205: (2.0 Hours, Ground Instruction)

I. OBJECTIVE:

- Introduce FARs related specifically to commercial pilot operations.
- Review NTSB Part 830

II. ACADEMIC CONTENT:

CHECK LIST

FAR 1	_____
FAR 61	_____
-Requirements for certificates and rating	_____
-Duration of Pilot Certificate	_____
-Medical Certificate Requirements, Classes, Duration	_____
-Written Test	_____
-Practical Test	_____
-Pilot Logbook and Flight Records, Logging of Time	_____
-Recency of Experience Requirements (Day)	_____
-Recency of Experience Requirements (Night)	_____
-Commercial Pilot Privileges and Limitations	_____
FAR 91	_____
-General Operations and Flight Rules	_____
-Night and High Altitude Operations	_____
-VFR Requirements	_____
-IFR Requirements	_____
-Maintenance, Preventive Maintenance, Airworthiness	_____
-Familiarization with Subpart B	_____
-Familiarization with Subpart D	_____
FAR 119	_____
NTSB Part 830	_____

III. COMPLETION STANDARDS:

- Demonstrate understanding of the FARs and NTSB Part 830 during oral quizzing by instructor at completion of lesson.
- Student completes the Commercial Pilot Exercises in the FAR/AIM.

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Commercial Pilot Certification Course-ASEL

Ground Training Syllabus

LESSON 206: (1.0 Hours, Stage Exam)

I. OBJECTIVE:

- Administer a Stage Exam that covers the aeronautical charts and VFR cross-country operations, as well as sections of Chapter 1, 3, and 9 of the Instrument / Commercial Manual, and Federal Aviation Regulations related to Commercial Pilot Knowledge Areas.

II. ACADEMIC CONTENT:

CHECK LIST

Stage I Exam

Airports, Airspace, and Flight Information _____

Meteorology _____

Aeronautical Charts _____

Pilotage and Dead Reckoning _____

Aviation Physiology _____

Aeronautical Decision Making and Judgment _____

14 CFR Part 119 _____

14 CFR Part 135 _____

14 CFR Part 121 _____

14 CFR Part 91 _____

14 CFR Part 61 _____

NTSB Part 830 _____

Review of Deficient Areas _____

III. COMPLETION STANDARDS:

- The lesson and stage are complete when the student has passed the Stage I Exam with a minimum score of 80%, and the instructor has reviewed each incorrect response to ensure complete understanding before the student progresses to the next stage and lesson.

STAGE II

STAGE OBJECTIVE

During this stage, the student will learn the operation of complex aircraft systems, how to predict aircraft performance, and advanced aerodynamics appropriate to complex airplanes. The student also will learn about commercial decision making, and how to perform the flight maneuvers required for commercial pilot certification.

STAGE COMPLETION STANDARDS

This stage is complete when the student has taken the Stage II Exam with a minimum passing score of 80%, and the instructor has reviewed each incorrect response to ensure complete understanding.

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Commercial Pilot Certification Course-ASEL

Ground Training Syllabus

LESSON 407: (2.0 Hours, Ground Instruction)

I. OBJECTIVE:

- Gain a working understanding of fuel injection systems including components and system operation.
- Become familiar with high performance engine systems and their proper use.
- Understand the concepts and systems related to propeller pitch control.

II. ACADEMIC CONTENT:

CHECK LIST

Principles and Functions of Aircraft Systems

Powerplants	_____
Fuel Systems	_____
Hydraulic Systems	_____
Flight Controls	_____
Landing Gear	_____
Electrical Systems	_____

High Performance Powerplants

Fuel Injection Systems	_____
Starting Procedures	_____
Normal Start	_____
Hot Starts	_____
Flooded Starts	_____
Engine Monitoring	_____
Exhaust Gas Temperature Gauge	_____
Cylinder Head Temperature Gauge	_____
Abnormal Combustion	_____
Induction Icing	_____

Turbo-Charging

Turbo-charging Principles	_____
System Operation	_____
High Altitude Performance	_____

Constant-Speed Propellers

Propeller Principles	_____
Constant-Speed Propeller Operation	_____
Power Controls	_____

III. COMPLETION STANDARDS:

- Demonstrate understanding of high performance powerplants.

LESSON 408: (2.0 Hours, Ground Instruction)

I. OBJECTIVE:

- Understand the operation of aircraft environmental control systems.
- Gain a working knowledge of the operation and limitations of ice control systems.

II. ACADEMIC CONTENT:

CHECK LIST

Oxygen Systems

Continuous-Flow

Diluter-Demand

Pressure-Demand

Oxygen Storage

Oxygen Servicing

Cabin Pressurization

Operating Principles

Pressurization Principles

Pressurization Components

Pressurization Emergencies

Ice Control Systems

Airfoil Ice Control

Windshield Ice Control

Propeller Ice Control

Other Ice Control Systems

III. COMPLETION STANDARDS:

- Demonstrate understanding of environmental and ice control systems.

LESSON 409: (2.0 Hours, Ground Instruction)

IV. OBJECTIVE:

- Understand the operation and limitations of retractable landing gear systems

V. ACADEMIC CONTENT:

CHECK LIST

Landing Gear

Landing Gear Systems

Gear System Safety

Airspeed Limitations

Operating Procedures

Gear System Malfunctions

Emergency Gear Extension

VI. COMPLETION STANDARDS:

- Demonstrate understanding of retractable landing gear systems during oral quizzing by instructor at completion of lesson.

LESSON 410: (2.0 Hours, Ground Instruction)

VII. OBJECTIVE:

- Integrate aerodynamic theory with the operational factors affecting airplane flight characteristics.

VIII. ACADEMIC CONTENT:

CHECK LIST

Four Forces of Flight

- Lift _____
- Lift Equation _____
- Controlling Lift _____
- High Lift Devices _____
- Drag _____
- Induced Drag _____
- Parasite Drag _____
- Ground Effect _____
- Thrust _____
- Weight and Load Factor _____
- V-g Diagram _____

Aircraft Stability

- Static _____
- Dynamic _____
- Longitudinal Stability _____
- Lateral Stability _____
- Directional Stability _____

Aerodynamics and Flight Maneuvers

- Straight-and-Level Flight _____
- Climbs _____
- Glides _____
- Turns _____
- Stall and Spin Awareness _____
- Stall Causes and Types _____
- Stall Recognition and Recovery _____
- Spin Causes and Phases _____
- Spin Recovery _____

IX. COMPLETION STANDARDS:

- Demonstrate understanding of advanced aerodynamic concepts during oral quizzing by instructor at completion of lesson.

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Commercial Pilot Certification Course-ASEL

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LESSON 411: (2.0 Hours, Ground Instruction)

X. OBJECTIVE:

- Gain the working knowledge needed to understand airplane performance and the methods used to calculate performance.

XI. ACADEMIC CONTENT:

CHECK LIST

Predicting Performance

Density Altitude

Surface Winds

Weight

Runway Conditions

Significance and Effects of Exceeding Aircraft Performance

Maximum Weights

Center of Gravity Location

Runway Takeoff Distance Available for Landing

Runway Landing Distance Available for Takeoff

The Pilot's Operating Handbook

Performance Charts

Takeoff Charts

Climb Performance Charts

Cruise Performance Charts

Descent Charts

Landing Distance Charts

Glide Distance

Stall Speeds

XII. COMPLETION STANDARDS:

- Demonstrate ability to understand and calculate aircraft performance data during oral quizzing by instructor at completion of lesson.

LESSON 412: (2.0 Hours, Ground Instruction)

I. OBJECTIVE:

- Understand the importance of controlling weight and balance and its effects on aircraft performance.
- Learn the methods of computing weight and balance.

II. ACADEMIC CONTENT:

CHECK LIST

Controlling Weight and Balance

Weight and Balance Limitations

Center of Gravity Limits

Weight and Balance Documents

Weight and Balance Computations

Weight and Balance Condition Checks

Computation Method

Graph Method

Table Method

Weight Shift Computations

Significance and Effects of Exceeding Aircraft Limits

III. COMPLETION STANDARDS:

- Demonstrate understanding of aircraft weight and balance computations and performance.

LESSON 413: (2.0 Hours, Ground Instruction)

I. OBJECTIVE:

- Understand the procedures and performance considerations necessary to execute maximum performance takeoffs and landings.

II. ACADEMIC CONTENT:

CHECK LIST

Soft Field

Takeoff and Climb

Description / Procedure

Approach and Landing

Short Field

Takeoff and Climb

Description / Procedure

Approach and Landing

Combined Procedures

III. COMPLETION STANDARDS:

- Demonstrate understanding of maximum performance takeoffs and landings.

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LESSON 414: (2.0 Hours, Ground Instruction)

I. OBJECTIVE:

- Introduce steep turns and chandelles including performance factors and safety considerations relevant to the maneuvers.

II. ACADEMIC CONTENT:

CHECK LIST

Steep Turns

Description

Procedure

Chandelles

Description

Procedure

III. COMPLETION STANDARDS:

- Demonstrate understanding of steep turns and chandelles during oral quizzing by instructor at completion of lesson.

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Commercial Pilot Certification Course-ASEL

Ground Training Syllabus

LESSON 415: (2.0 Hours, Ground Instruction)

I. OBJECTIVE:

- Learn how to fly lazy eights and eights-on-pylons maneuvers.
- Acquire knowledge of how maneuvers introduced during the commercial pilot phase of training develop pilot skill.

II. ACADEMIC CONTENT:

CHECK LIST

Lazy Eights

Description

Procedure

Eights-On-Pylons

Description

Procedure

III. COMPLETION STANDARDS:

- Demonstrate understanding of lazy eights and eights-on-pylons during oral quizzing by instructor at completion of lesson.

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Commercial Pilot Certification Course-ASEL

Ground Training Syllabus

LESSON 416: (2.0 Hours, Ground Instruction)

I. OBJECTIVE:

- Understand the emergency procedures for various situations during commercial flight operations under VFR.
- Become Familiar with some basic forced landing procedures, emergency equipment, and survival gear.

II. ACADEMIC CONTENT:

CHECK LIST

Emergency Procedures

Emergency Descent

Emergency Approach and Landing

In-Flight Fire

Partial Power Loss

Door Opening in Flight

Asymmetrical Flap Extension

Emergency Equipment and Survival Gear

III. COMPLETION STANDARDS:

- Demonstrate understanding of commercial pilot emergency procedures during oral quizzing by instructor at completion of lesson.

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Commercial Pilot Certification Course-ASEL

Ground Training Syllabus

LESSON 417: (2.0 Hours, Ground Instruction)

I. OBJECTIVE:

- Understand the decision-making process related to commercial flight operations.
- Learn how human factors affect aeronautical decision making and how crew resource management skills can enhance flight safety.

II. ACADEMIC CONTENT:

CHECK LIST

Commercial Decision Making	
Commercial Operations	_____
Applying the Decision-Making Process	_____
Crew Resource Management	_____
Hazardous Attitudes	_____
Crew Relationships	_____
Communication	_____
Barriers to Effective Communication	_____
Resource Use	_____
Internal and External Resources	_____
Workload Management	_____
Planning and Preparation	_____
Prioritizing	_____
Situational Awareness	_____
Controlled Flight Into Terrain	_____

III. COMPLETION STANDARDS:

- Demonstrate thorough understanding of the commercial decision making during oral quizzing by instructor at completion of lesson.

LESSON 418: (1.0 Hours, Stage II Exam)

IV. OBJECTIVE:

- Administer the stage exam covering knowledge of advanced airplane systems and performance, aeronautical decision making and other material covered in Chapters 11, 12, 13, and 14 of the Instrument/Commercial Manual.

V. ACADEMIC CONTENT:

CHECK LIST

Stage II Exam

High Performance Powerplants	_____
Environmental and Ice Control Systems	_____
Retractable Landing Gear	_____
Advanced Aerodynamics	_____
Predicting Airplane Performance	_____
Controlling Weight and Balance	_____
Commercial Flight Maneuvers	_____
Emergency Procedures	_____
Commercial Decision Making	_____

VI. COMPLETION STANDARDS:

- The lesson and stage are complete when the student passes a Stage II Exam with a minimum passing grade of 80%, and the instructor has reviewed each incorrect response to ensure complete understanding before the student progresses to the Commercial Pilot End-of-Course Exam.

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Commercial Pilot Certification Course-ASEL

Ground Training Syllabus

LESSON 419: (2.0 Hours, End-Of-Course Exam)

I. OBJECTIVE:

- Demonstrate comprehension of academic material presented in preparation for the FAA Commercial Pilot Airman Knowledge Test.

II. ACADEMIC CONTENT:

The student will complete a comprehensive exam to include all knowledge areas found in the FAA Commercial Pilot Airman Knowledge Test.

III. COMPLETION STANDARDS:

- The lesson and stage are complete when the student passes an End-Of-Course Exam with a minimum passing grade of 80%, and the instructor has reviewed each incorrect response to ensure complete understanding before the student progresses to the Commercial Pilot Airman Knowledge Test.

TECH AVIATION FLIGHT SCHOOL, INC.

APPROVED SCHOOL CERTIFICATE #TVMS353S

**COMMERCIAL PILOT CERTIFICATION COURSE
AIRPLANE SINGLE-ENGINE LAND (ASEL)
FLIGHT TRAINING SYLLABUS**

PRINT STUDENT NAME:

LAST NAME, FIRST NAME

**_____/_____/_____
DATE (mm/dd/yyyy)**

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