

**AERO 50 Course Outline as of Spring 2012****CATALOG INFORMATION**

Dept and Nbr: AERO 50 Title: PRIVATE PILOT GRND SCHL

Full Title: Private Pilot Ground School Course

Last Reviewed: 5/14/2007

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**

Federation Aviation Administration (FAA) Part 141 approved course in aviation studies. This course will introduce the student to pilot training, aviation opportunities, human factors in aviation, airplane systems, and aerodynamic principles, as well as the flight environment. The student will obtain the necessary aeronautical knowledge and meet the prerequisites specified in Federal Aviation Regulations (FAR) Part 61 and Part 141 for a private pilot airmen knowledge test.

**Prerequisites/Corequisites:****Recommended Preparation:**

Course Eligibility for ENGL 1A

**Limits on Enrollment:****Schedule of Classes Information:**

Description: FAA Part 141. Pilot training, aviation opportunities, human factors in aviation, airplane systems, and aerodynamic principles, as well as the flight environment. Students gain necessary aeronautical knowledge to meet the prerequisites specified in Federal Aviation

Regulations (FAR) Part 61 and Part 141 for a private pilot airmen knowledge test. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Course Eligibility for ENGL 1A

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:

<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
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<b>CSU Transfer:</b>	Effective:	Inactive:
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<b>UC Transfer:</b>	Effective:	Inactive:
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**CID:**

**Certificate/Major Applicable:**

Certificate Applicable Course

## **COURSE CONTENT**

### **Outcomes and Objectives:**

Upon completion of this course, the student will be able to:

Stage I:

1. Evaluate pilot training, aviation opportunities and human factors in aviation.
2. Describe airplane systems and aerodynamic principles, as well as the flight environment.
3. Demonstrate basic knowledge of flight safety, airports, aeronautical charts, airspace, radio communications, and air traffic control services, including the use of radar.
4. Explain radio procedures and describe the common sources of flight information.

Stage II:

1. Explain meteorological theory and describe typical weather patterns and aviation weather hazards.
2. Obtain and interpret various weather reports, forecasts, and graphic charts.
3. Analyze and interpret Federal Aviation Regulations (FARs) as they apply to private pilot operations.

Stage III:

1. Predict performance and control the weight and balance condition of the airplane.
2. Demonstrate knowledge of the basic concepts for VFR (Visual Flight Rules) navigation using pilotage, dead reckoning, and aircraft navigation systems.

3. Explain the basic concepts of how to use aeronautical charts, plotters, flight computers, and flight publications to plan cross-country flight.
4. Demonstrate understanding of VOR (VHF Omnidirectional Range), ADF (Automatic Direction Finder), and advanced navigation systems.
5. Evaluate the physiological factors that can affect both pilot and passengers during flight.
6. Conduct comprehensive preflight planning for cross-country flights and analyze factors affecting aeronautical decision making.

## **Topics and Scope:**

### **STAGE I**

#### **Ground Lesson 1: Discovering Aviation**

##### **A. Pilot training**

1. How to get started
2. Role of the FAA (Federal Aviation Administration)
3. Fixed-Base Operators (FBOs)
4. Eligibility requirements
5. Types of training available
6. Phases of training
7. Private pilot privileges and limitations

##### **B. Aviation Opportunities**

1. New experiences
2. Aviation organizations
3. Category/Class ratings
4. Additional pilot certificates
5. Aviation Careers

##### **C. Introduction to Human Factors**

1. Aeronautical decision making
2. Crew resource management training
3. Pilot-in-command responsibility
4. Communication
5. Resource use
6. Workload management
7. Situational awareness
8. Aviation physiology
9. Alcohol, drugs, and performance
10. Fitness for flight

#### **Ground Lesson 2: Airplane Systems**

##### **A. Airplanes**

1. Fuselage
2. Wings
3. Empennage
4. Landing gear
5. Engine / propeller
6. Pilot's Operating Handbook (POH)

##### **B. Powerplant and related systems**

1. Reciprocating engine
2. Induction systems
3. Supercharging and turbocharging
4. Ignition systems
5. Fuel systems

6. Refueling
7. Oil systems
8. Cooling systems
9. Exhaust systems
10. Propellers
11. Propeller hazards
12. Electrical systems

#### C. Flight instruments

1. Pitot-static instruments
2. Airspeed indicator
3. Altimeter
4. Vertical speed indicator
5. Gyroscopic instruments
6. Magnetic compass

### Ground Lesson 3: Aerodynamic Principles

#### A. Aerodynamic forces of flight

1. Lift
2. Airfoils
3. Pilot control of lift
4. Weight
5. Thrust
6. Drag
7. Ground effect

#### B. Stability

1. Three axes of flight
2. Longitudinal stability
3. Center of gravity position
4. Lateral stability
5. Directional stability
6. Stalls
7. Spins

#### C. Aerodynamics of maneuvering flight

1. Climbing flight
2. Left-turning tendencies
3. Descending flight
4. Turning flight
5. Load factor

### Ground Lesson 4: The Flight Environment

#### A. Safety of flight

1. Collision avoidance/visual scanning
2. Airport operations
3. Right-of-way rules
4. Minimum safe altitudes
5. Taxiing in wind
6. Positive exchange of flight controls

#### B. Airports

1. Controlled and uncontrolled
2. Runway layout
3. Traffic pattern
4. Airport visual aids
5. Taxiway markings
6. Ramp area hand signals

7. Runway incursion avoidance
8. Land and hold short operations (LAHSO)
9. Airport lighting
10. Visual glideslope indicators
11. Approach light systems
12. Pilot-controlled lighting

C. Aeronautical charts

1. Latitude and longitude
2. Projections
3. Sectional charts
4. World aeronautical charts
5. Chart symbology

D. Airspace

1. Classifications
2. Uncontrolled airspace
3. Controlled airspace
4. Class E
5. Class D
6. Class C
7. Class B
8. Class A
9. Special VFR
10. Special use airspace
11. Other airspace areas
12. Emergency air traffic rules
13. Air defense identification zones

Ground Lesson 5: Communication and Flight Information

A. Radar and air traffic control (ATC) services

1. Radar
2. Transponder operation
3. FAA radar systems
4. VFR radar services
5. Automatic Terminal Information Service (ATIS)
6. Flight service stations
7. VHF directional finder assistance

B. Radio procedures

1. VHF communication equipment
2. Using the radio
3. Phonetic alphabet
4. Coordinated universal time
5. Common Traffic Advisory Frequency (CTAF)
6. ATC facilities and controlled airports
7. Lost communication procedures
8. Emergency procedures
9. Emergency locator transmitters (ELTs)

C. Sources of flight information

1. Airport/Facility Directory
2. Federal Aviation Regulations
3. Aeronautical Information Manual (AIM)
4. Notices to Airmen (NOTAMs)
5. Advisory circulars
6. Jeppesen Information Services

## Ground Lesson 6: STAGE I EXAM

- A. Airplane Systems
- B. Aerodynamic Principles
- C. The Flight Environment
- D. Communication and Flight Information

## STAGE II

## Ground Lesson 7: Meteorology for Pilots

- A. Basic weather theory
  - 1. The atmosphere
  - 2. Atmospheric circulation
  - 3. Atmospheric pressure
  - 4. Coriolis force
  - 5. Global wind patterns
  - 6. Local wind patterns
- B. Weather patterns
  - 1. Atmospheric stability
  - 2. Temperature inversions
  - 3. Moisture
  - 4. Humidity
  - 5. Dewpoint
  - 6. Clouds and fog
  - 7. Precipitation
  - 8. Airmasses
  - 9. Fronts
- C. Weather hazards
  - 1. Thunderstorms
  - 2. Turbulence
  - 3. Wake turbulence
  - 4. Wind shear
  - 5. Microburst
  - 6. Icing
  - 7. Restriction to visibility
  - 8. Volcanic ash

## Ground Lesson 8: Private Pilot FARs (Federal Aviation Regulations)

- A. FAR Part 1
- B. FAR Part 61
- C. FAR Part 91
- D. NTSB 830

## Ground Lesson 9: Interpreting Weather Data

- A. The forecasting process
  - 1. Forecasting methods
  - 2. Types of forecasts
  - 3. Compiling and processing weather data
  - 4. Forecasting accuracy and limitations
- B. Printed reports and forecasts
  - 1. Aviation Routine Weather Report (METAR)
  - 2. Radar weather reports
  - 3. Pilot weather reports
  - 4. Terminal Aerodrome Forecast (TAF)
  - 5. Aviation area forecast
  - 6. Winds and temperatures aloft forecast
  - 7. Severe weather reports and forecasts

## 8. AIRMET/SIGMET/Convective SIGMET

### C. Graphic weather products

1. Surface analysis chart
2. Weather depiction chart
3. Radar summary chart
4. Satellite weather pictures
5. Low-level significant weather prognostic
6. Convective outlook chart
7. Forecast winds and temperatures aloft chart
8. Volcanic ash forecast and dispersion chart

### D. Sources of weather information

1. Preflight weather sources
2. In-flight weather sources
3. Enroute flight advisory service
4. Weather radar services
5. Automated weather reporting systems

## Ground Lesson 10: STAGE II Exam

### STAGE III

## Ground Lesson 11: Airplane Performance

### A. Predicting performance

1. Aircraft performance and design
2. Chart presentations
3. Factors affecting performance
4. Takeoff and landing performance
5. Climb performance
6. Cruise performance
7. Using performance charts

### B. Weight and balance

1. Importance of weight
2. Importance of balance
3. Terminology
4. Principles of weight and balance
5. Computation method
6. Table method
7. Graph method
8. Weight shift formula
9. Effects of operating at high total weights
10. Flight at various CG (center of gravity) positions

### C. Flight computers

1. Mechanical flight computers
2. Time, speed, and distance
3. Airspeed and density altitude computations
4. Wind problems
5. Conversions
6. Multi-part problems
7. Electronic flight computers
8. Modes and basic operations

## Ground Lesson 12: Navigation

### A. Pilotage and dead reckoning

1. Pilotage
2. Dead reckoning
3. Flight planning

4. VFR cruising altitudes
5. Flight plan
6. Lost procedures
- B. VOR Navigation
  1. VOR operations
  2. Ground and airborne equipment
  3. Basic procedures
  4. VOR orientation and navigation
  5. VOR checkpoints and test signals
  6. VOR precautions
  7. Horizontal situation indicator
  8. Distance measuring equipment (DME)
- C. ADF (automatic direction finder) navigation
  1. ADF equipment
  2. Orientation
  3. Homing
  4. ADF intercepts and tracking
  5. Moveable-card indicators
  6. Radio magnetic indicator
  7. ADF precautions
- D. Advanced navigation
  1. VORTAC-based area navigation
  2. Long range navigation (LORAN)
  3. Inertial navigation system
  4. Global positioning system

#### Ground Lesson 13: Applying Human Factors Principles

- A. Aviation physiology
  1. Vision in flight
  2. Night vision
  3. Visual illusions
  4. Disorientation
  5. Respiration
  6. Hypoxia
  7. Hyperventilation
- B. Aeronautical decision making
  1. Applying the decision making process
  2. Pilot-in-command responsibility
  3. Communication
  4. Workload management
  5. Situational awareness
  6. Resource use
  7. Applying human factors training

#### Ground Lesson 14: Flying Cross-Country

- A. Flight planning process
  1. Developing the route
  2. Preflight weather briefing
  3. Completing the navigation log
  4. Flight plan
  5. Preflight inspection
- B. The flight
  1. Departure
  2. Centennial Airport to Pueblo Memorial Airport



3. Pueblo Memorial Airport to La Junta Municipal Airport
4. La Junta Municipal Airport to Centennial Airport
5. Diversion to Limon Municipal Airport
6. Return to Centennial Airport

Ground Lesson 15: STAGE III EXAM

Ground Lesson 16: End of Course Final Exam

### Assignment:

1. Reading assignments, 15-20 pages per week.
2. Homework problems including: calculations, problem solving, and interpreting and utilizing chart and table information.
3. Weekly quizzes to assess student progress.
4. Stage I, Stage II, and Stage III written exams.
5. Private pilot end of course final exam "A". (Student must achieve a score of 70% or better to obtain FAA endorsement to qualify to take the required FAA aeronautical knowledge test.)

### Methods of Evaluation/Basis of Grade:

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.

Writing  
0 - 0%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems

Problem solving  
5 - 10%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations  
0 - 0%

**Exams:** All forms of formal testing, other than skill performance exams.

Multiple choice, Completion, Short answer.

Exams  
80 - 90%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Attendance and participation

Other Category  
5 - 10%

### Representative Textbooks and Materials:

Guided Flight Discovery Private Pilot textbook, by Jeppessen Sanderson Training Products, Jeppessen Sanderson (current year).  
Private Pilot Syllabus by Jeppessen Sanderson Training Products, Jeppessen Sanderson (current year).  
Private Pilot FAA Airmen Knowledge Test Guide, Jeppessen Sanderson (current year).  
U.S. Govt. Publications current year: Aeronautical Information Manual FARs (Federal Aviation Regulations).