



## **I. Course Overview:**

Upon successful completion of this course, the students should be able to enter ASC 1210, ASC 1550, ASC 1610. In addition, the students should have acquired the aeronautical knowledge to successfully meet the written examination requirements for a private pilot certificate with an airplane category and single engine class rating in the following areas of: aerodynamics, aircraft engines and systems, flight instrument, airplane weight and balances, performances, weather and regulations, basic navigation and human factors.

## **II. Units:**

### **Unit 1. Airplane Nomenclature and Basic Aerodynamics**

#### General Outcome:

- 1.0 The students should be able to identify airplane components and understand the forces which cause an airplane to fly.

#### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Identify airplane components.
- 1.2 List and explain the four forces acting on the airplane - lift, drag, thrust and gravity.
- 1.3 Describe a stall and recovery procedures.
- 1.4 List and explain the three axes.
- 1.5 Describe forces and events occurring within a turn.
- 1.6 Develop an understanding of wake turbulence, its effect and avoidance procedures.

## Unit 2. Aircraft Engine & Systems

### General Outcome:

2.0 The students should be able to understand the design and functioning of reciprocating engines, fuel systems and electrical systems.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 2.1 Explain the anatomy of a reciprocating engine including the four stroke operating cycle and how torque is converted to thrust.
- 2.2 Identify and discuss associated engine instruments and controls.
- 2.3 Compare/Contrast types of propellers (fixed vs. constant speed).
- 2.4 Explain cooling and lubrication systems and components on the private pilot level.
- 2.5 Describe differing aircraft and engine fuel systems and their associated components.
- 2.6 Discuss basic principles of electricity and airplane electrical systems.

### Unit 3. Flight Instruments

#### General Outcome:

3.0 The students should be able to understand the basic principles and operation of aircraft instruments.

#### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 3.1 Distinguish among and categorize aircraft instruments.
- 3.2 Discuss the use, operation and interpretation of each of the Pilot-static instruments.
- 3.3 Discuss the use, operation and interpretation of each of the gyroscopic instruments.
- 3.4 Discuss the use, operation and interpretation of the magnetic compass.
- 3.5 List and explain each of the errors of the magnetic compass.

## Unit 4. Airplane Weight and Balance and Flight Preparation

### General Outcome:

- 4.0 The students should be able to solve airplane weight and balance problems and calculate flight preparation data.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 4.1 Determine the importance of weight and balance and flight preparation.
- 4.2 Calculate CG positioning as well as contrast the effects of a forward and Aft CG position.
- 4.3 Calculate weight and balance problems using the computation method.
- 4.4 Calculate weight and balance problems using the graphical method.
- 4.5 Calculate weight and balance problems using the tabular method.
- 4.6 Define terms associated with weight and balance calculations.
- 4.7 Discuss and understand the importance of flight preparation to include check lists, preflight and take-off data calculations.

## Unit 5. Airplane Performance and Flight Standards

### General Outcome:

5.0 The students should be able to understand various factors which effect airplane performance and how to calculate various aspects of performance.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

5.1 Discuss the effects of altitude, humidity, and temperature on airplane performance.

5.2 Determine pressure and density altitude using appropriate charts.

5.3 Determine take-off performance using appropriate tables and graphs.

5.4 Determine climb and cruise performance using appropriate charts. Define aircraft limitations.

5.5 Determine landing performance using appropriate graphs and tables.

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