EO M231.05 – DESCRIBE AIRCRAFT CONTROL SURFACES

1. **Performance**: Describe Aircraft Control Surfaces

2. **Conditions**:

   a. Given:

      (1) Supervision; and

      (2) Assistance as required.

   b. Denied: N/A.

   c. Environmental: Suitable classroom facilities or training area large enough to accommodate the entire group.

3. **Standard**: In accordance with A-CR-CCP-263/PT-001, *From the Ground Up: Millennium Edition*, the cadet shall describe aircraft control surfaces, to include:

   a. the location, operation and purpose of:

      (1) empennage control surfaces;

      (2) a main wing's control surfaces; and

      (3) trim tabs; and

   b. the method and purpose of balanced controls.

4. **Teaching Points**:

TP	Description	Method	Time	Refs
TP1	Identify the control surfaces of the empennage, to include: a. the horizontal/vertical stabilizers; b. the rudder; and c. the elevator.	Interactive Lecture	5 min	C3-116 (pp. 11–16)
TP2	Explain how stabilizers reduce unwanted axial movement.	Interactive Lecture	5 min	C3-116 (pp. 11–16)
TP3	Explain that the rudder rotates the aircraft about its vertical (yaw) axis by pushing the tail to either left or right.	Interactive Lecture	5 min	C3-116 (pp. 11–16)
TP4	Explain that the elevator rotates the aircraft about its lateral (pitch) axis by pushing the tail up or down.	Interactive Lecture	5 min	C3-116 (pp. 11–16)
TP5	Describe the cockpit controls that move the associated empennage control surfaces. Have the cadets enact control movements with a "pilot" calling out pedal and stick movements to the remainder of the class, who then act as pitch and yaw control surfaces.	In-Class Activity	5 min	C3-116 (pp. 11–16)

TP	Description	Method	Time	Refs
TP6	Identify the wing control surfaces, to include: a. ailerons; and b. flaps.	Interactive Lecture	5 min	C3-116 (pp. 11–16)
TP7	Explain that the ailerons lift one wing and lower the opposite wing simultaneously as the one cockpit control is operated to control roll.	Interactive Lecture	5 min	C3-116 (pp. 11–16)
TP8	Explain that flaps are used to generate lift at the expense of airspeed and that both left and right flaps operate simultaneously.	Interactive Lecture	5 min	C3-116 (pp. 11–16)
TP9	Explain that trim tabs were developed to hold control surfaces in position without constant control pressure from the pilot. Identify common locations of trim tabs.	Interactive Lecture	5 min	C3-116 (pp. 11–16)
TP10	Explain that dynamically balanced control surfaces use air pressure to assist the pilot moving the controls by having a portion of the control surface in front of its hinge to catch the passing air.	Interactive Lecture	5 min	C3-116 (pp. 11–16)
TP11	Colour and label the control surfaces in a drawing of an aircraft.	In-Class Activity	5 min	C3-116 (pp. 11–16)

5. **Time**:

a.	Introduction / Conclusion:	5 min
b.	Interactive Lecture:	45 min
c.	In-Class Activity:	10 min
d.	Total:	60 min

6. **Substantiation**:

   a. An interactive lecture was chosen for TP1 to TP4 and TP6 to TP10 to introduce aircraft control surfaces and give an overview of them.

   b. An in-class activity was chosen for TP5 and TP11 as it is an interactive way to provoke thought and stimulate an interest among the cadets.

7. **References**: C3-116 A-CR-CCP-263/PT-001 (ISBN 0-9680390-5-7) MacDonald, A. F. and Peppler, I. L. (2000). *From the Ground Up: Millennium Edition.* Ottawa, ON: Aviation Publishers Co. Limited.

8. **Training Aids**:

   a. Presentation aids (e.g. whiteboard/flipchart/OHP) appropriate for the classroom/training area; and

   b. Model of a light fixed-wing aircraft with wing struts, fixed gear and control surface detail.

9. **Learning Aids**: Coloured pencils.
10. **Test Details**: N/A.
11. **Remarks**: It is recommended that the two periods required for this EO be scheduled consecutively.

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