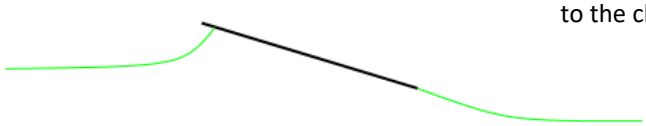
Class 3 : Aug 28

21 September 2020 17:50

Flat Plate

We use Streamlines at the Stationary points and analyze the change in momentum suffered by the fluid

There is an opposite force on the flate equal to the change on momentum of the fluid



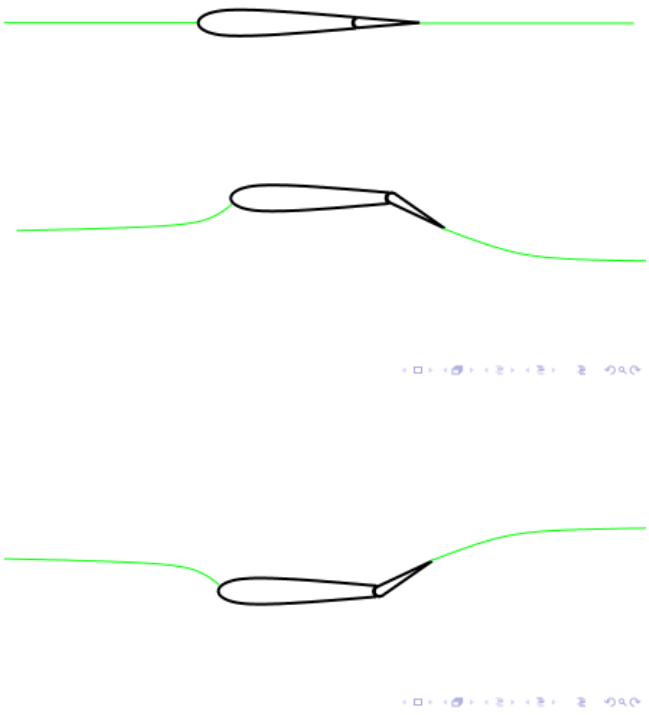
Cambered Plate

Here it shape of the plate is used to change the momentum of the fluid and gain an upward force

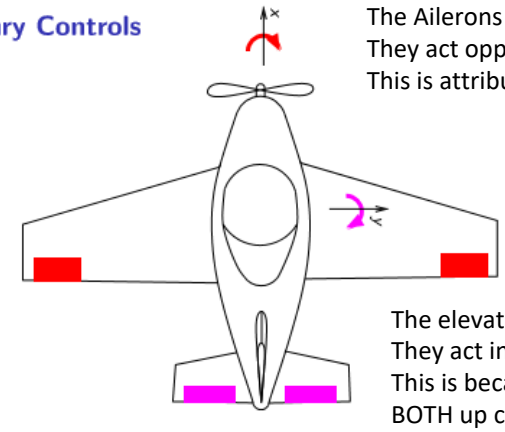
Symmetric Airfoil

Control Surface Manipulation

Instead of changing the orientation of the whole airfoil we can have a control surface whose orientation can be changed to obtain the desired force



Primary Controls

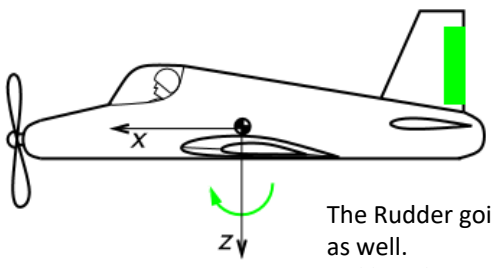


Ailerons - Roll about *x*
Elevators - Pitch about *y*

The Ailerons are responsible for the movement of the plane about the x axis.
They act oppositely : LEFT up, RIGHT down or LEFT down, RIGHT up
This is attributed to the fact that they lie on opposite sides of the axis and the CG

The elevators are responsible for the movement of the plane about the y axis.
They act in the same manner : BOTH up or BOTH down.
This is because they're on the same side of the axis and CG
BOTH up causes the nose of the aircraft to point up and so on.

Primary Controls



Rudder - Yaw about *z*

The Rudder is responsible for the movement of the Plane about the z axis

The Rudder going inside the plane of the screen causes the nose to turn inwards as well.
Unlike Ailerons and the Elevators, There is only 1 rudder.