

WORKSHOP

GULL-WING AIRPLANE FUSELAGE DESIGN

Ilaria Mazzoleni, Instructor - imsciarc@yahoo.com
Prof. Geoff Spedding, USC

5 meetings - 1 unit

1st meeting Sat, February 5th, 10am-1pm USC School of Engineering
2nd individual group meeting, time TBD , SCI-Arc
3rd meeting Sat, February 26th , 10am-1pm SCI-Arc
4th individual group meeting, time TBD , SCI-Arc
5th meeting, Sat March 19th, final presentation

Course Intent

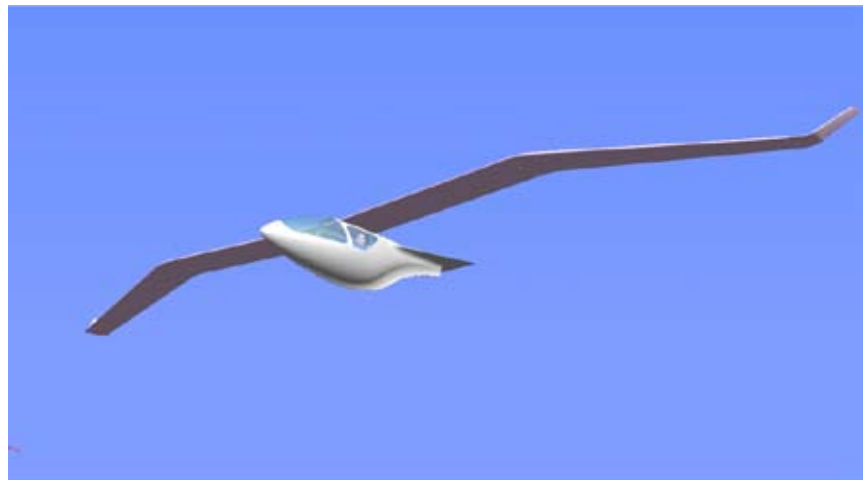
This workshop, in collaboration with Professor Geoff Spedding, from USC Department of Aerospace and Mechanical Engineering, will focus on the development of an airplane design inspired by seagulls. During the workshops students will first learn about the design of the seagull inspired airplane and focus then on the optimization of the internal airplane layout along with the design for the interior layout of cabin to accommodate passengers.

Students will be exposed to the theoretical principles explained by material and aerospace scientists and engineers, through lectures (by Prof. Rawdon) case studies and field trips, which will deepen and develop their specific interests in airplane design. Through a series of charettes students will then sketch out possible layout configurations that will be presented on March 19th.

The gull-wing model on the bottom right appears not only novel, but strange too. Why has this configuration not been developed before? The top right image shows that in fact it may have been in use for tens of millions of years.



These three panels show the streamlines as air flows around the wings and body of a new gull-wing aircraft design. Left is the wing-body combination with no tail, middle shows a much more efficient flow pattern produced by adding a short tail section. Right panel shows a deflected tail producing high lift. All images from data taken at USC by GR Spedding and RJ Huyssen. All images produced by RJ Huyssen.



Gull-wing Aircraft Design. 2010. Image by RJ Huyssen.