EAE 127 Applied Aircraft Aerodynamics (4) Fall 2009
Prof. J.J. Chattot

Tentative Course Outline

1 Longitudinal equilibrium of a glider

2 Airfoils characteristics
2.1 Inviscid, incompressible flow past a circular cylinder
2.2 Inviscid, incompressible flow past a flat plate
2.3 Thin Airfoil Theory (inviscid, incompressible)
-quasi-Joukowski airfoils
-arbitrary airfoils
2.4 Effects of compressibility (inviscid)
-at subsonic speeds
-at supersonic speeds
-at transonic speeds
2.5 Effects of viscosity
2.6 High lift devices

3 Wing characteristics
3.1 Wing geometry parameters
3.2 Small disturbance theories (inviscid)
-governing equations
-evaluation of forces
-Prandtl Lifting Line Theory
-Lifting Surface Theory
-Slender Body Theory

4 Equilibrium of a Glider (revisited)

5 Wing/body interference

Text: *John J. Bertin, Russell M. Cummings, Aerodynamics for Engineers, Fith Edition, Prentice Hall*
Other References (available in Shields Library):
-J.D. Anderson,Jr., Fundamentals of aerodynamics, Third Edition, McGraw Hill, 2001
- Arnold M. Kuethe and Chuen-Yen Chow, Foundations of Aerodynamics, Bases of Aerodynamic Design, Fifth Edition, Wiley, 1998
-Abbott and von Doenhoff, Theory of wing sections, Dover, 1949

Classroom: *Lec. HOAGLAND 168 (MWF 11:00-11:50 AM), Disc. HARING 2016 (F 1:10-2:00 PM)*

Office: *2004 BAINER (MWF 10:00-11:00 am), tel: 2-0812*

TA: *TBA*
TA Office hrs: TBA

Midterm: *Monday, Nov 2*

Final: *Thursday, Dec. 10, 10:30 AM-12:30 PM*

Grading: Project 40%, Midterm 20%, Final 40%

This course addresses the following Educational Outcomes for the Mechanical Engineering and Aeronautical Sciences Engineering Programs:

a.work comfortably and competently with mathematics, science, and basic engineering principles,

b.design an engineering system, component, or process to meet prescribed needs and constraints,

c.identify, formulate and solve engineering problems,

d.use the techniques, skills, and modern engineering tools necessary for engineering practice.