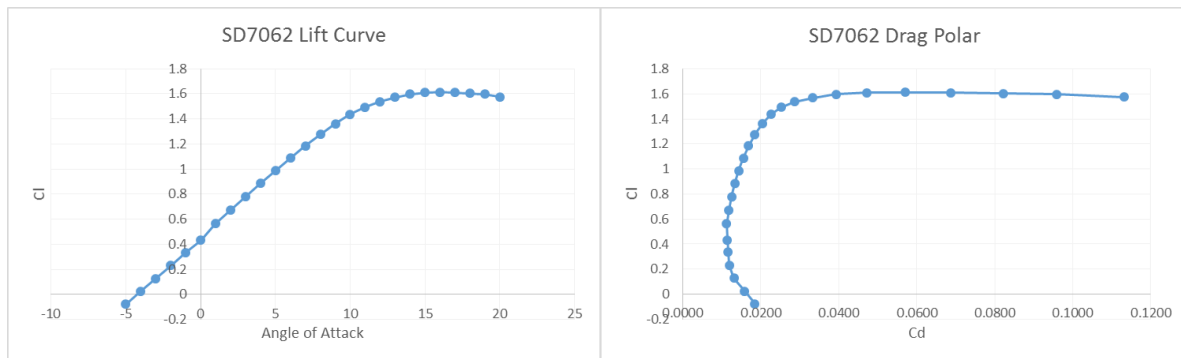# AEM 313 Problem Set #5

Due: 13th October 2017

1. Using XFOIL analyze and plot for both the **NACA 4414** and **Selig Donovan SD7062** at Re=150000.
   - Lift Curves: C_l versus α
   - Drag polars: C_d versus C_l
   - Airfoils with boundary layer thickness and velocity profile at C_{lmax} (separate plots)

2. Use Thin Airfoil Theory for a flat airfoil with a 20% flap deflected to 20 degrees to estimate
   - C_l versus angle of attack
   - C_m at the quarter chord.

   Compare with the Cl and Cm when the flaps are retracted (i.e. deflected 0 degrees)

3. Plot the location of 1) the aerodynamic center and 2) the center of pressure for a circular-arc airfoil of 0%, 5% and 10% camber over an AOA range.
4. Discuss why slats are aerodynamically different from flaps.